















MANUAL ON SPECIES IN TRADE (WCCB)







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A Manual on Manual on LIFE

Species in trade

(First Edition)

WILDLIFE CRIME CONTROL BUREAU

MINISTRY OF ENVIRONMENT AND FORESTS
GOVERNMENT OF INDIA



A Manual on wildlife species in trade

First edition 2011

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जयराम रमेश JAIRAM RAMESH



राज्य अंत्री (स्वतंत्र प्रभार) पर्यावरण एवं वन भारत सरवार सई दिल्ली–1 1 0 0 0 3 MINISTER OF STATE (INDEPENDENT CHARGE) ENVIRONMENT & FORESTS

GOVERNMENT OF INDIA NEW DELHI - 110 003

4th January 2011



FOREWORD

A wildlife contraband starts its journey from the place of its poaching at a remote part of the country, moves by many modes of conveyance and crosses many borders. It has to pass through jurisdictions of many enforcement agencies competent to seize the contraband before it is smuggled out of the country to a foreign market. Since, interception of wildlife contraband is not the primary functional area of most of the agencies, their personnel lack knowledge and experience for recognizing the contrabands which helps the criminals to move and pass the contrabands without detection.

I am happy to see that Wildlife Crime Control Bureau (WCCB) has identified this as a critical area for improvement and brought out this handbook which will serve as a ready reference for many enforcement agencies, whose alertness will lead to better detection, control and prevention of wildlife crime. The multitude of agencies and their personnel should make full use of this handbook which has been painstakingly prepared by WCCB to make it easy for anyone to refer to and recognize wildlife contraband in the first instance before the confirmatory tests and actions can be undertaken.

(Jairam Ramesh)

PREFACE

There has been repeated demand from various enforcement and border agencies about the lack of knowledge of its personnel to visually recognize various wildlife contrabands which they come across during inspections, surveillance, baggage screening etc. Based on this felt need, the Wildlife Crime Control Bureau (WCCB) has compiled this manual as a ready reference.

This manual has been selectively prepared to show only the most commonly traded wildlife contraband, as it is not possible to prepare a complete list of all wildlife products. The agencies may note that similar and near resemblance cannot be taken as confirmatory. Additional tests like morphological, microscopic analytical and forensic tests may have to be undertaken for legal action. Therefore, this manual may be used as a ready reference for prima-facie recognition only.

RINA MITRA Additional Director/IGP Wildlife Crime Control Bureau

ACKNOWLEDGEMENT

The material in "Identification Manual on Wildlife Species in trade" has been drawn from several sources listed in the references at the end of the publication.

WCCB would like to express its gratitude to the following Departments/Institutions:

- AYUSH, Ministry of Health & Family Welfare, Govt. of India.
- Regional Plant Resource Centre, Bhubaneshwar Govt. of Orissa.
- Himalayan Forest Research Institute, Shimla.
- Director, National Zoological Garden, New Delhi.
- Madras Crocodile Bank Trust, Chennai.
- Chennai Snake Park, Chennai.
 - Further, various State Forest Departments & Regional Offices of the Bureau have helped in facilitating the data & sample collection.
 - We would also like to acknowledge the work done by the following officials and individuals:
- Sh. P.Subramanyam, the then Deputy Director, WCCB for the Identification Manual on Red Sanders and Tiger skin as well as supporting the process of development of the manual.
- Sh. Ramesh K. Pandey, RDD (NR), WCCB for providing the some of the photographs of Indian live birds in trade, bear bile etc
- Ms. Tejaswini Patil, RDD (WR), WCCB for the Identification Manual on Medicinal Plants.
- Sh. Abhijit Roy Chowdhury, Wildlife Inspector, WCCB, Kolkata for providing useful information related to Wildlife trade at Foreign Post Office
- Sh. Rakesh Burman Technical Asst., WCCB, Mumbai for the Identification Manual on Butterfly.
- A.K. Bharadwaj, ACF, Rajasthan, Forest Dept. for providing the photographs of Indian live birds.
- Sh. Mukul Srivastava and Ms. Neha Sharma, Criminology & Forensic Science Assistants (contractual), WCCB have contributed significantly for sections on 1.) Microscopic Hair Signature Pattern of Mammals 2.) Manual on Live Birds in trade 3.) Notes on skulls of Felidae apart from compiling the entire manual.

It is our hope that the collective efforts made for compilation of this manual will help the enforcement agencies who are engaged in combating the illegal wildlife trade.

INTRODUCTION

India has nearly 6.5% of the world's known wildlife species, and is one of the mega diverse countries of the world. The global demand for wildlife and its products puts at risk the mega diversity of the country. The changing market dynamics and the lifestyles make the existing regulatory regimes inadequate in dealing with the wildlife crimes assuming organized status. It calls for coordinated actions in combating the wildlife related crimes including building capacity for scientific and professional investigation along with other measures.

The Government of India constituted a statutory body, the Wildlife Crime Control Bureau on 6th June 2007, by amending the Wildlife (Protection) Act, 1972 a special act to protect the wildlife in the country. The bureau would complement the efforts of the state governments, primary enforcers of the Wildlife (Protection) Act, 1972 and other enforcement agencies of the country.

The functions of the Wildlife Crime Control Bureau are defined under section 38(Z) 1 of the Wildlife (Protection) Act, 1972 which includes collection of intelligence, establishing of national wildlife crime database, coordination, implementation of international convention, capacity building for scientific and professional investigation and assisting the State Governments to ensure success in prosecutions.

As part of building capacity for scientific and professional investigation, this compendium would be very useful to enforcement personnel since it combines all the existing and the newly added manual at one place as a handy tool for identification and familiarization of species. The Compendium comprises of mammals included in Schedule I, II, III, IV, Amphibians, Reptiles, Birds, Butterfly, Fishes, Coral Fishes, Mollusca, Microscopic hair signature pattern. The Flora section includes Red Sanders, Medicinal plant in trade (Schedule VI). It also includes chapters containing catalogue on wildlife samples, Wildlife trade though Foreign Post Offices etc.

Implementation of the provisions of Wildlife (Protection) Act, 1972 at times become difficult due to lack of adequate scientific/technical knowledge for identification of species and law enforcement by various agencies involved. It is hoped that the compendium achieves its objective of creating awareness/preventing illegal activities, helping in identification of wildlife items relating to legality of the material and conservation of wildlife.

Wildlife Crime Control Bureau
Ministry of Environment and Forests
Government of India



Mammals

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Explanatory Notes

Explanatory notes on inclusion of any species under the Schedules to the Wildlife (P) Act '72 (WPA) & Trade Restriction

The Wildlife (P) Act. 1972 provides, inter alia, for the legal frame work for the protection of various species of wild fauna & flora, management of their habitats & regulation/ control/prohibition of trade in protected species of wild fauna & flora. Under the Act various species of wild fauna are specified under Schedule I to V & some species of wild flora are specified under Schedule VI. The wild faunal species are included under five Schedules (I to V) depending upon their population status in the wild and the degree of threat. The most rare endangered & vulnerable species of wild fauna (includes Mammals, Birds, Reptiles, Fishes, Grustacea, Insects, Coelenterates, Mollusca & Echinodermata) are included under the Schedule-I. Hunting trade, possession, offer to sale & even transportation of the Scheduled species are strictly prohibited under the Act.

Explanatory Notes on inclusion of any species under the Appendices of CITES (Convention on International Trade in Endangered Species of Wild Fauna & Flora) & Trade Restriction

The species which are listed in Appendix I to the Convention are threatened with extinction which are, or may be affected by trade. So as not to endanger them further, no permits are issued for international trade in these species unless there are exceptional circumstances with proper documentation and permits issued by both importing and exporting Country. The species which are included in Appendix II are mainly the species which might become endangered if trade in them is not controlled and monitored in order to avoid utilization incompatible with their survival. They are listed in Appendix II to the Convention. To prevent threatened species from being traded under the guise of non-threatened species similar in appearance, some non-threatened species are also included in this appendix, International trade in Appendix II species is permitted with proper documentation issued by the government of the exporting country.

The species which are included in Appendix III are the species not listed under the Appendix II & II and in which any member country seek international cooperation and help in enforcing trade regulation. Permits are generally issued for trade monitoring and regulation purpose by particular country seeking inclusion of the species under the Appendix III. In this book 'O' represents animals which are not included in the CITES list.

However, the member countries may enforce even stricter control than required by the CITES for special protection to any listed species or may even ban trade in all their wildlife.

Explanatory Notes on IUCN (International Union for the Conservation of Nature & Natural Resources) Threatened Species Categories

Species identified as threatened by IUCN are assigned a category indicating the degree of threat. Definitions are as follows:

Ex) Extinct : Species not definitely located in the wild during the past 50 years.

 E) Endangered. Taxa in danger of extinction and whose survival is unlikely if causal factors continue operating.

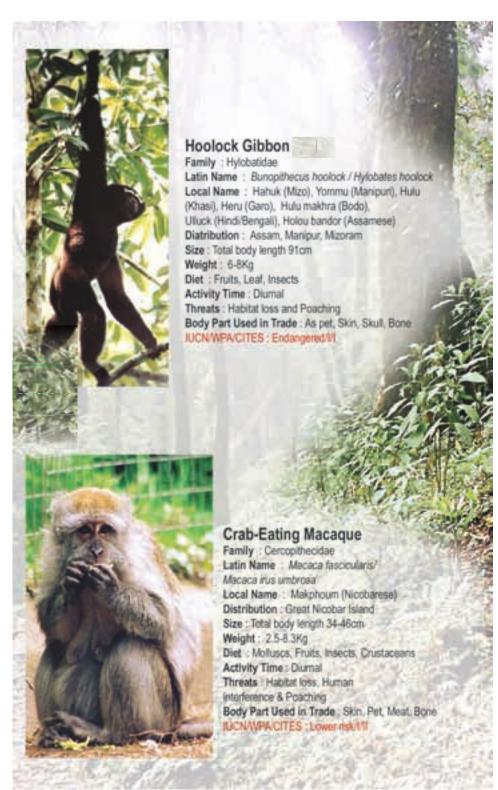
V) Vulnerable: Taxa believed likely to move into the 'Endangered' category in the near future if causal factors continue operating.

R) Rare. Taxa known to be Endangered, "Vulnerable or Rare" but where there is insufficient information to say which of these categories is appropriate.

Threatened: Threatened is a general term to denote species which are 'Endangered','
Vulnerable'. 'Rare', 'Indeterminate' or 'Insufficiently known' it is used to identify taxa
comprised of several sub-faxa which have differing status categories.

C) Commercially Threatened | Taxa not currently threatened with extinction but most or all of whose populations are threatened as a sustainable resource, or will become so unless their exploitation is regulated.











Kashmir Stag/Hangul

Family : Cervidae

Latin Name : Cervus elaphus hangul Local Name : Minemer, Hangul, (Kashmin) Distribution : North India (Kashmir and

Himachal Pradesh)

Size: Height at shoulder 119-126cm

Weight: -180Kg Diet: Grass, Leaf

Activity Time: Diumai, Nocturnal Threats: Habitat loss and Poaching Body Part Used in Trade: Antier, Skin-IUCNWPA/CITES: Crit. endangered(V)

Tibetan Gazelle

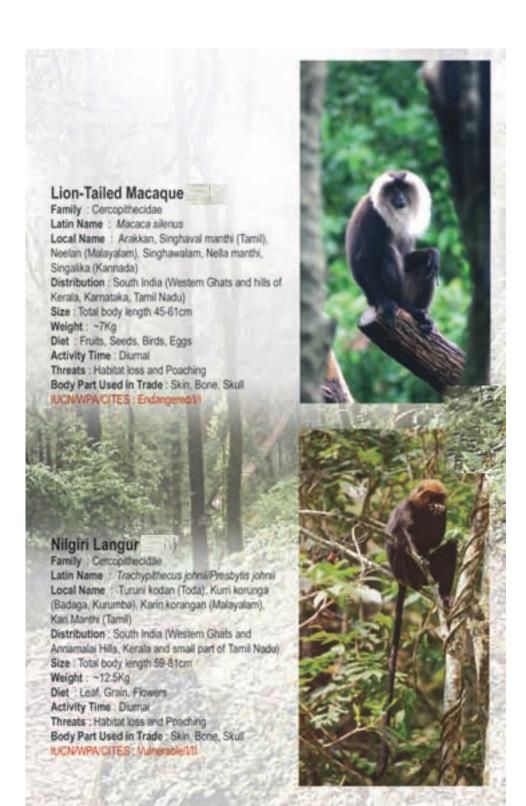
Family Bovidae

Latin Name : Procepts picticaddate Local Name : Gows (Ledakhi) Distribution : Ladakh and Sikkim Size : Height at shoulder 61cm

Weight: 26-40Kg Diet: Grass, Leaf Activity Time: Diumal Threats: Poaching

Body Part Used in Trade : Skin, Meat IUCN/WPA/CITES : Lower iskINO









Phayre's Leaf Monkey

Family : Cercopithecidae Latin Name : Trachypithecus phayrei

Local Name: Kasia bandor (Tripuri), Dodhi, Dawr (Mizo),

Dodhi bandor (Bengali), Chasma, Chasma chakwa bandor (Assamese)

Distribution: North East India (Tripura, Mizoram and Assam)

Size: Total body length 44-60cm

Weight: - 7Kg Diet : Leaf, Fruits, Seeds Activity Time : Diumai

Threats: Habitat loss and Poaching Body Part Used in Trade: As Pet, Skin, Skull

IUCN/WPA/CITES : Endangered/I/II



Golden Langur

Family : Cercopthecidae

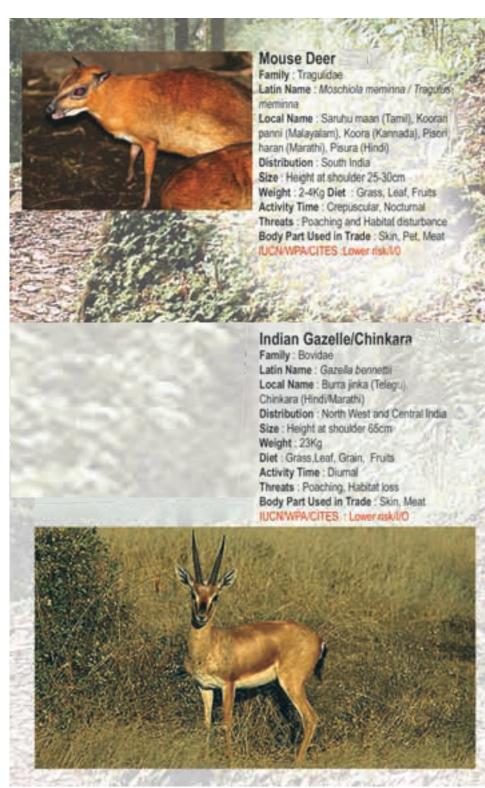
Latin Name : Trachypitnecus geei Local Name : Sugrib (Bhotia), Makre gophur (Bodo), Sonali bandar (Assamese) Distribution : North East India (Assam) Size: Total body length 49-61cm

Weight: ~ 12.5Kg Diet : Leaf, Fruits, Flowers Activity Time: Diumal

Threats Habitat loss and Poaching Body Part Used in Trade : Furskin, Bone-(UCN/WPA/CITES : Endangered/l/)









Takin/Mishmi Takin

Family : Bovidae

Latin Name: Budorcas taxicolor Local Name: Takin (Adi) Distribution: Arunachal Prasdesh Size: Height at shoulder 109-129cm

Weight: 200-301Kg Diet: Grass, Leaf Activity Time: Diurnal Threats: Poaching

Body Part Used in Trade : Skin, Meat IUCN/WPA/CITES : Vulnerable/MI

Nilgiri Tahr

Family : Bovidae

Latin Name : Hemitragus hylocrius Local Name : Varai aadu (Tamil), Vara aadu

(Malayalam)

Distribution : South India (Western Ghat,

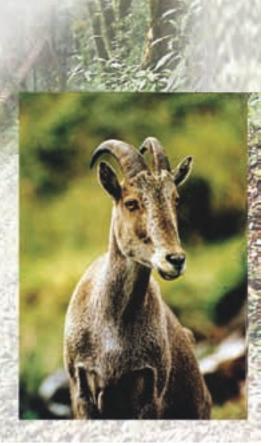
Nigiri, Annamalai hills)

Size Height at shoulder 89-111cm

Weight : 60-105 Kg Diet : Grass Leaf Activity Time : Diumal

Threats: Poaching and Habitat disturbance. Body Part Used in Trade: Skin, Meat. Hom

IUCN/WPA/CITES Endangered/I/O







Himalyan Tahr

Family : Bovidae

Latin Name: Hemitragus jemfahicus Local Name: Jehr (Western Himalayas), Tehr, Jharal (Nepalese), Jegla (Kashmiri) Distribution: Jammu and Kashmir to Sikkim Size: Height at shoulder 81-101cm

Weight: 62-101Kg Diet: Grass, Leaf Activity Time: Diumal

Threats: Poaching and habitat loss
Body Part Used in Trade: Skin, meat, hom
IUONWPA/CITES:: Vulnerable/I/O

Asiatic Wild Buffalo

Family: Bovidae

Latin Name: Bubalus ameerbubalis Local Name: Jongli mosh (Bengali). Bonoria moh (Assamese), Arna (Hindi) Distribution: Assam & Central India Size: Height at shoulder 156-181cm Weight: 799-1200Kg Diet: Grass Activity Time: Diumal, Noctumal Threats: Habitat loss, cattle grazing and

inbreeding

Body Part Used in Trade : Horn, skin,

bone, meat

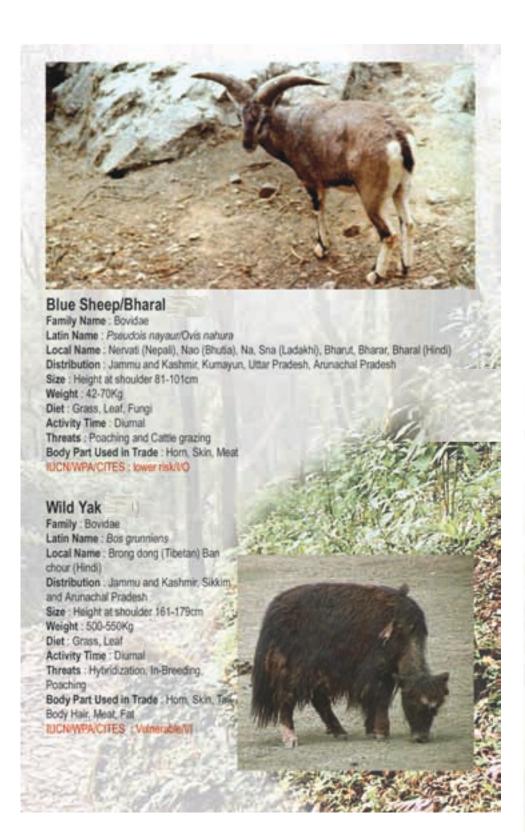
IUCN/WPA/CITES : Endangered/I/III







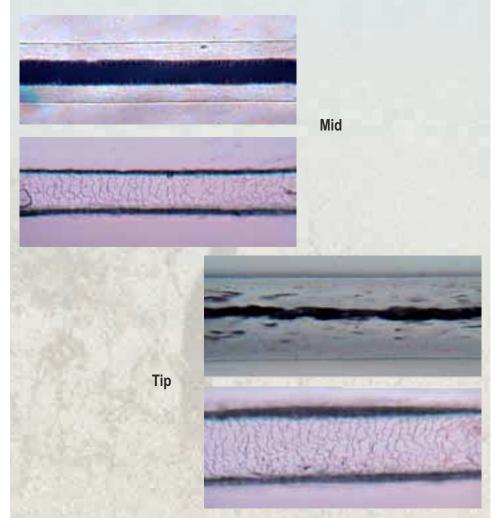






Hair signature pattern of Bos grunniens (Yak)

- Color- Creamish White
- Cuticular Scale Pattern-Imbricate Wavy
- Medulla-Cellular/vacuolated
- Medullary Index-0.355
- Source-WCCB (HQ), Delhi





Manis pentadactyla

Common name: Chinese Pangolin, IUCN/CITES: Lower Risk / App-II.

Body morphology:

Elongated and tapering body, covered with 15-18 longitudinal rows of overlapping scales Underside covered with coarse, bristly hair Ear conch well developed Tail tip naked. Teeth in jaws absent.

Natural habitat: The Chinese Pangolin inhabits tropical Asian forests and hilly countries. **Threats:** Poaching and habitat loss.

Body parts in trade: Hunted flesh with is a delicacy among the tribals Also hunted for its scales which are supposed to have medicinal value.







Manis crassicaudata

Common name: Indian Pangolin, IUCN/WPA/CITES: Lower Risk/I/App-II

Body morphology: Larger than Chinese Pangolin. Elongated and tapering body, covered with 11-13 longitudinal rows of overlapping scales, Underside covered with coarse, bristly hair, Eyes small and ear conch rudimentary. Feet having curved blunt claws which are used for digging. **Natural habitat:** Inhabits forests and open grasslands. Also found near villages. **Threats:** Poaching and habitat loss. Body parts in trade: The major reason behind hunting pangolin is the supposed medicinal values of its scales which are recently reported to be smuggled out of India in the CD/DVD Boxes. Scales are also used to make finger rings and buckles. Another reason for hunting pangolin is its delicious meat.



PANGOLIN SCALES

Pangolin scales come from the pangolin (also called a scaly anteater), a toothless, scale-covered mammal native to Africa and China, belonging to the Manidae family. They are

found in tropical regions of Africa and Asia. Pangolins actually resemble armadillos in appearance, with small heads, long, broad tails and well-developed claws. Pangolin scales are harvested from the pangolin through a process that involves boiling and parching. The name "pangolin" derives from the Malay word *pengguling* ("something that rolls up").

Pangolins are nocturnal animals, and use their well-developed sense of smell to find insects. The long-tailed pangolin is also active by day. Pangolins spend most of the daytime sleeping, curled up into a ball.

- 1. The physical appearance of pangolins is marked by large, hardened, plate-like scales. The scales, which are soft on newborn pangolins but harden as the animal matures, are made of **keratin**, the same material of which human fingernails and tetrapod claws are made.
- 2. The color, pattern, quantity, shape, and size of the scales differ across the seven species, and can also differ slightly within species, depending on the part of the body covered. They generally have 18 rows of overlapping (imbricate) scales around the body.
- 3. The coloration of the scales includes dark brown, dark olive-brown, pale olive, yellow brown, and yellowish. Generally, the scales are bilaterally symmetrical, then flattened from the top down, and directed towards the back of the animal. The number of scales remains the same throughout their life.
- 4. The African and Asian species are distinguished by the row of scales on the tail. In all species, the row of scales is continuous to the tip of the tail, but the African species have a double row starting two-thirds of the way down to the tip.
- 5. The scale surface is corrugated forming a structure that is not smooth. Pangolin scale comes in direct contact with soil and rock. The abrasive behavior is related to their chemical constitution. The scales are razor-sharp, providing extra defence. Pangolin Scales have the functions of anti adhesion and anti wear against soil and rock.
- **6.** The scales when lost due to wear are replaced from the stratum germinativum (which provides for regeneration of cells) in the dermis (skin base). The process of scale replacement occurs when living cells (the epidermis) on the dermal papillae grow to the surface. The epidermis



eventually cornifies (the converting of skin cells into horny material) in the depressions between the dermal papillae to make a loose stratum corneum. On top of and at the tip of the papillae, the processes of epidermal cornification lead to the formation of hard (horny) scales.



- 7. Pangolin scales are associated with the Liver and Stomach meridians, and are considered to reduce swelling, promote blood circulation, help breast-feeding women produce milk and have slightly cold properties. The scales of the pangolin are used in conjunction with herbs to treat a host of conditions, including masses in the abdomen, amenorrhea, rheumatism, arthralgia, postpartum galactostasis, skin and external diseases, and scrofula (tuberculosis of lymph nodes, especially in the neck). Pangolin scales are also used to invigorate the blood and promote menstruation, promote lactation, reduce swelling and dispel pus.
- **8.** The size of pangolins varies by species, ranging from 30 cm to 100 cm (12 to 39 inches). Females are generally smaller than males. The pangolin possesses hair and scales, an unusual combination for mammals. It has a small pointed head and narrow mouth with a fine set muzzle. It also has a fleshy nose bearing nostrils.

Chinese pangolin

Chinese pangolin have about 18 rows of overlapping scales. The yellow-brown scales are bony, up to 2 in (5 cm) across, and encompass all of the body (including the tail) except for its snout, cheeks, throat, inner limbs, and belly. They have hairs at the base of the body scales.

Indian pangolin

They have large, pale yellowish brown or yellow-gray scales, with brownish skin and hair; with about 14–16 rows of scales on the tail. Scales make up about one-fourth to one-third of body weight.







Diet : Large Mammals, Small Mammals, Cattle, Carrion, Grass, Fruits, Roots, Insects Activity Time : Diurnal Threats : Habitat disturbance and Poaching

Body Part Used in Trade : Gall bladder, Skin

IJCN/WPA/CITES: Vulnerable/VI

Himalayan/Asiatic Black Bear

Family: Ursidae

Latin Name : Ursus thidetanus

Local Name: Dom (Bhutia), Sanar (Nepali), Hapich (Kashmiri) Haput, Reech (Hind.) Distribution: North East India; Jammu-Kashmir to Arunachal Pradesh Size: Total body length 141-171cm.

Weight: 91-116Kg

Diet Fruits, Nuts, Honey, Grain, Insects, Small Mammals, Cattle, Carrion

Activity Time : Diurnal, Nocturnal

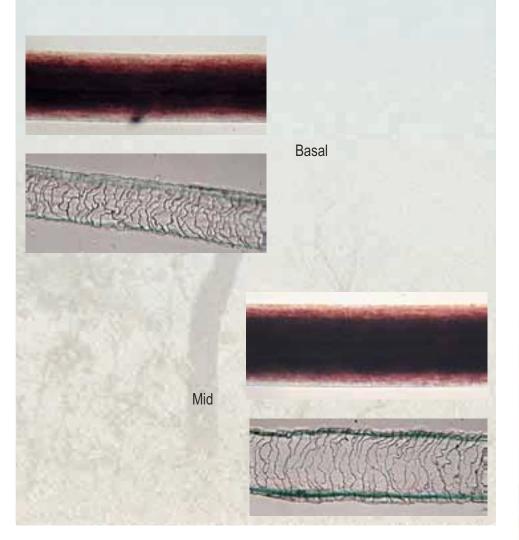
Threats: Poaching and Human interference Body Part Used in Trade : Gail bladder,

Skin, Live animal.

IUCN/WPA/CITES . Vulnerable/V

Hair signature pattern of *Melursus ursinus* (Sloth Bear)

- Color- Grey with light & dark brown patches
- Cuticular Scale Pattern-Imbricate
- Medulla-Ladder Medulla
- Medullary Index-0.799
- Legal Status- Appeneix I of CITES and Schedule I of WL(P)
 A, 1972
- Source-WCCB (ER), Kolkatta









Tip



Identification note on Bear Bile

- Bear bile contains ursodeoxycholic acid (UDCA), which is believed to reduce fever, protect the liver, improve eyesight, break down gallstones, and act as an anti-inflammatory.
- Bear gallbladders are generally traded fresh, frozen or dried; dried form is mostly in trade.
- Preserved bear gall bladders can vary widely in color (brown to black) and sometimes the bear gallbladders are of the same color as pig gall bladders.
- The gallbladders from pigs are frequently traded as fake bear gallbladders.

Identifying Characteristics:

- Color: Dark brown to dark blackish.
- Shape: It has a conical shape i.e. broad at one end and tapered at the other.
- The fresh bladder contains yellowish fluid.
- The yellowish crystals are found in dried or old bladder.

Mechanism for extraction of bear bile from gall bladder

The bile is usually extracted twice a day through an implanted tube, producing 10–20 ml of bile each time; the process is believed to be painful, as the bears can be seen moaning and chewing their paws while being milked. Other methods include pushing a hollow steel stick through the bear's abdomen.

In the "free drip" method a permanent hole or fistula is made in the bear's abdomen and gall bladder, from which bile drips out freely. The wound is vulnerable to infection and bile can bleed back into the abdomen, causing a high mortality rate.



Chemical Analysis:

Preliminary test for bile: 10-20 mg of the yellow content+ conc. $H_2SO_4 + 3.5$ % solution of Phosphomolybidic acid in iso-propyl alcohol+heat Blue color indicates the presence of bile salts.

Confirmatory test for Bear Bile:

Thin Layer Chromatography: This technique is used to confirm whether the bile is of bear or not

- Dissolve 1 mg of yellow crystals from the suspected gall bladder in 1 ml of methanol
- Prepare reference bile acid standards of Taurocholic acid, Taurourseodeoxycholic acid and taurochenodeoxycholic acid by dissolving 1 mg of each acid in 1 ml of methanol.
- 10 microlitre of each sample is spotted to a activated thin layer chromatographic plate (20 x 20 cm coated with silica gel-G .22 mm thickness)
- The plate is developed in solvent system comprising of chloroform, isopropyl alcohol, acetic acid and water (30:30:4:1). After one run of 17 cm plate is removed and dried.
- The plate is re run up to 18 cm in the same solvent system and removed and dried.
- The plate is the sprayed with 20 %(aq) sulphuric acid solution and then with 3.5 % phosphomolybidic acid solution, isopropyl alcohol, followed by heating for five minutes in a hot air oven till blue spots appear on the plate.
- The R₁ values are calculated for suspected bear samples and compared with those of reference standards.

R, (Retention factor) = <u>Distance travelled by the solute</u>

Distance travelled by the solvent

Pendry Stephanie, Allan Crawford, Wu Joyce (2004); Traditional Asian Medicine Identification Guide for Law Enforcers; Version II: Traffic International.

¹Wildlife Institute of India, Dehradun







Indian/Asian Elephant

Family: Elephanddae

Latin Name: Elephas maximus

Local Name: Yenugu (Telegu), Aane (Kannada, Malayalam),

Yanai (Tamii), Hathi (Hindi/Bengali/Assamese)

Distribution: North East India, West Bengal, Orissa, Jharkhand, South India.

Uttaranchal Size: Height at shoulder 244-276cm Weight: 3,500Kg Diet: Grass, Leaf, Fruits, Grain, Bark Activity Time: Diurnal Threats: Poaching, Habitat loss and Human animal conflict Body Part Used in Trade: Ivory, Meat, Legs as decorative item

IUCN/WPA/CITES : Endangered/III

Identification note on Elephant Ivory

Ivory is formed from dentine and constitutes the bulk of the teeth and tusks of animals such as the elephant, hippopotamus, walrus, mammoth and narwhal.



The tusks and upper incisors of these animals can have a cross section of up to 20cm (8"), and be up to 2.5m (almost 3 yards) long. They are oval in cross section, and are made up of a hard, dense tissue called dentin, which is made up of 70% inorganic material, and 30% collagen. Unlike human teeth, elephant tusks do not have an enamel coating. They do have a cementum layer, however; ivory dealers refer to this as the "bark" or the "rind". Occasionally, this layer is retained on a piece of worked ivory. One-third to one-half of an elephant tusk is hollow.

Growth occurs as layer upon layer of calcified tissue is deposited on the interior of the tusk; these concentric oval growth lines (called the Lines of Owen) can be seen in cross section. If ivory is cut lengthwise, these lines appear triangular. Fine and even near the hollow of the tusk (the pulp cavity), these lines become wavy and have milky areas between them as you get closer to the outside of the tusk.

General Information about Elephant Ivory:

- Chemically, ivory is similar to bone and antler and comprises collagen matrix with a mineral component.
- Unlike bone, it has no blood vessel system and therefore denser.
- One third to one half of an elephant tusk is hollow.
- They are oval in cross section and are made up of hard dense tissue called dentin which is made up of 70 % inorganic material and 30 % collagen.
- Unique to elephant ivory are the Lines of Retzius (also known as Schreger lines). These fine intersecting lines are visible in cross section, and give an engine-turned effect (intersecting lines with a diamond shape between them).

Identifying Features of Ivory

- Schreger lines are visual artifacts that are evident in the cross-sections of ivory. They are commonly referred to as cross-hatchings, engine turnings, or stacked chevrons. Schreger lines can be divided into two categories. The easily seen lines which are closest to the cementum are the outer Schreger lines. The faintly discernible lines found around the tusk nerve or pulp cavities are the inner Schreger lines. The intersections of Schreger lines form angles, which appear in two forms: concave angles and convex angles. Concave angles have slightly concave sides and open to the medial (inner) area of the tusk. Convex angles have somewhat convex sides and open to the lateral (outer) area of the tusk.
- The Haversian canals would not be present in ivory and so are trabeculae.
- The Shreger lines are present on transverse sections.





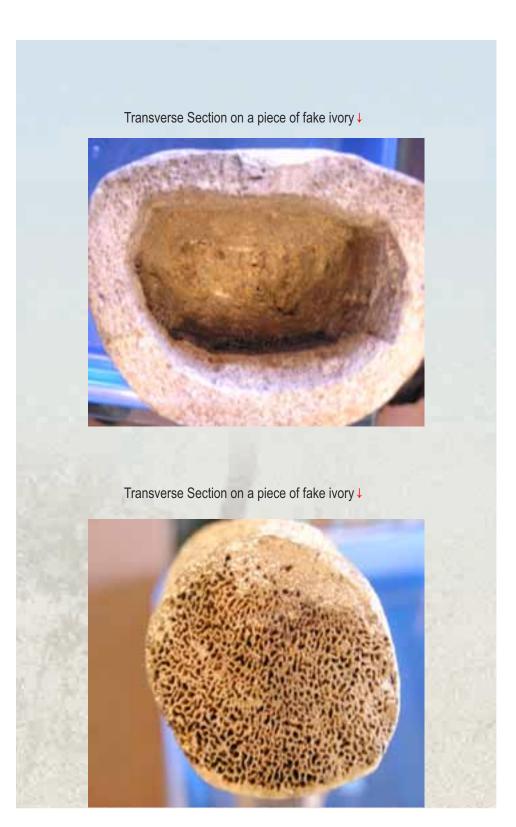
Photos showing the comparison of genuine ivory and the impugned pieces in C1 $\,$ Crime No:22 of 2003 $\,$

View of Pulp Cavity in genuine Elephant Ivory ↓



View indicating the dimension of the pulp cavity↓







Transverse Section on the tip of genuine ivory ↓



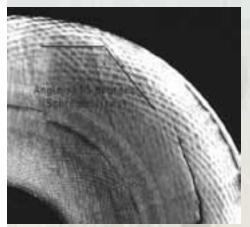
Schreger lines in cross-hatch pattern on the transverse section of genuine elephant ivory ↓



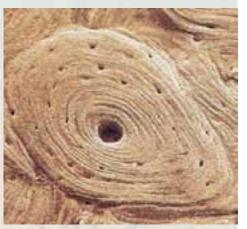
Transverse Section showing Trabeculae on a piece of fake ivory↓



Difference between Bone and Ivory:



Schreger Lines in Ivory



Haversian Canal in Bone

To identify ivory we have to look for grain patterns or lines. There will be two different patterns present. First will be somewhat parallel lines that would have been running along the length of the tooth or tusk the piece is carved from. Perpendicular to these lines will be a cross-section grain pattern. This crosssection should either look like V's or circular/parallel lines. If the lines form V's, it is either Elephant Ivory or Mammoth



Ivory. These V's are known as Schreger Lines. The angle of the **Schreger** lines will help us determine if the piece is Elephant or Mammoth ivory. Bone is very easy to identify. Unlike teeth and tusks, bones have tiny canals (**Haversian Canals**) that run through them to carry nutrients and house nerves and other organic material. Often times, some of this organic material adheres to the walls of these canals and turns dark as it decays. In well bleached pieces, this organic material may be very hard to see but the canals are still there and will show if you move the piece back and forth to reflect the light.

Greater One-Horned Rhinoceros

Family: Rhinocerotidae

Latin Name : Rhinocerds unicornis

Local Name: Gondar (Bengali). Gaur (Assamese).

Gainda (Hindi) Distribution: West Bengal, Assam and Uttararichal

Size: Height at shoulder 171-184cm

Weight: 1,400-2,200Kg Diet: Grass Activity Time: Diurnal, Noctumal

Threats : Poaching and Habitat loss

Body Part Used in Trade : Horn, Skin and Other body parts used in

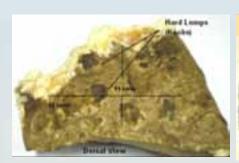
East Asian Traditional Medicine IUCNWPA/CITES : Endangered M.



General Information

- Skin naked (hairless) divided into shields with epidermal knobs.
- The skin of the Indian rhinoceros forms plate like folds that give the appearance of armor plating.
- It is covered with tubercles, hard lumps that look like rivets holding the animal's armor together.

- They have gray-brown skin thrown into thick folds- a feature particularly prominent in male Indian rhinos, which develop extra folds around their necks as they age.
- A thick protective skin, 1.5-5cm thick, formed from layers of collagen positioned in a lattice structure.





General Information:

- The most obvious distinguishing characteristic of the rhinos is a large horn above the nose. Rhinoceros horns, unlike those of other horned mammals, consist of keratin only and lack a bony core, such as bovine horns.
- Both African species and the Sumatran Rhinoceros have two horns, while the Indian and Javan Rhinoceros have a single horn. Rhinoceroses have acute hearing and sense of smell, but poor eyesight.
- The Indian Rhino has a single horn that reaches a length of between 20 and 100 cm. Its size is comparable to that of the White Rhino in Africa.

Physical Characteristics

- The color of the one horned Indian rhino varies from grayish brown to black.
- A rhinos horn grows all through its lifetime and grows at a rate of 1 - 3 inches per year, the longest recorded rhino horn is 5 feet long. If a rhino's horn is broken off, it will grow back again.





- The texture of rhino horn is rough due to the presence of rough hair on the surface of the horn.
- Fake rhino horns are also seen and seized which are made up of buffalo horn, limb bone of cattle or are wooden



Chemical Analysis

• Since the main constituent of rhino horn is Keratin, the simple preliminary protein test can be applied to distinguish between the real and a fake horn.

Scientific name: Mochus spp.

Common name: Himalayan Musk Deer, IUCN/WPA/CITES: Lower Risk / I / App-I.

Body morphology:

Asmall deer with head without antlers Upper canines long, extending below upper lip in males but inconspicuous in females. Ears large and rounded. Rump higher than shoulders. Tail extremely short and flattened. Coat light brown, speckled with grey above, paler beneath Rows of light spots on back and flanks. Males possess musk gland anterior to sex organs. **Natural habitat:** Himalayan musk deer favours rugged terrain between 2200-4400m altitude in the Himalayas and occupies both alpine and forest belt. **Threats:** Poaching and habitat disturbance.



Body parts in trade:

The major threat for survival of this deer is the indiscriminate persecution throughout its range for musk pods from where musk is extracted and used in perfumery and in making of East Asian medicine.

Identification note on Musk Pod

- 1. Musk is obtained by killing the deer and removing the gland called "musk pod" found in mature males between the genital organs and the umbilicus.
- 2. The substance has been used as a popular perfume fixative since ancient times and is one of the most expensive animal products in the world. The name, originated from Sanskrit muṣká meaning "testicle," has come to encompass a wide variety of substances with somewhat similar odors although many of them are quite different in their chemical structures.
- 3. Local hunters can earn about US \$275– 310 per musk pod of 25 g average weight, while selling them to middleman¹. The market price is higher than gold, and hence poses pressure on the survival of the species. The small size of the musk gland means that it is easy to hide and transport. Musk is used for the treatment of ailments caused due to cold climate such as pneumonia, cough and chest congestion.

Physical Characteristics:

- Musk is of a dark purplish color, dry, smooth and unctuous to the touch, and bitter
 in taste whereas a musk pod is mostly brownish white colored. The same colored
 hairs are present on the Musk Pod.
- 2. The grain of musk will distinctly scent millions of cubic feet of air. In addition to its
 - odoriferous principle, it contains ammonia, cholesterol, fatty matter, a bitter resinous substance, and other animal principles.
- It appears in markets as grains or lumps concreted together, soft and unctuous to the touch, and of a reddish-brown or ferruginous color resembling that of dried blood.
- 4. Musk is usually in small irregular granules, not more than 2 mm. in thickness, blackish with a few brown fragments and becoming somewhat grayish on aging; glistening and somewhat oily; odor peculiar, penetrating, powerful and persistent; taste somewhat bitter.





5. It has a powerful penetrating and persistent odor which is due to the presence of the ketone **muskone**, **C**₁₆**H**₃₀**O**.

Physical Examination:

- 1. Musk is inflammable, burning with a white flame, and leaving a light spongy charcoal.
- **2.** Musk powder contains muskone that are soluble in alcohol but not in water indicates the presence of musk pod product.

Hair examination of musk deer:

The hair present on Musk pod can be examined under microscope to get cuticular significant and distinct hair signature pattern.

Color: Mostly White, Yellow & Black. Hairs show profound color changes and banding along shaft.

Average Length of hair: 1-2 cms

Hair Diameter: overall diameter of hair is coarse (approximately 300 micrometer) and Diameter constant throughout the hair.

Cuticle: They show variation in structure along shaft from root to tip and scale margins are round and isodiametric.

Pigmentation in cortex:

Pigments are not evenly distributed but denser towards medulla.

Medulla:

It is composed of spherical cells that occupy almost entire hair & it looks like honey-comb structure.

Medullary Index: >0.5

Root: wine glass shaped.



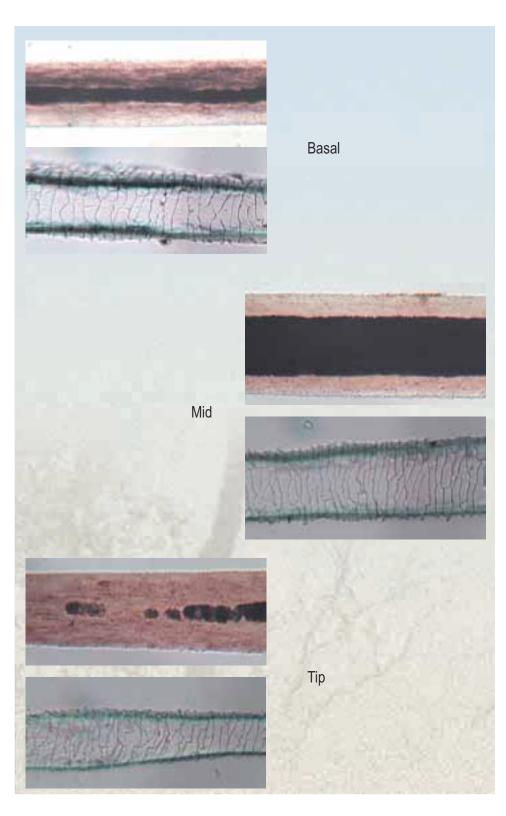


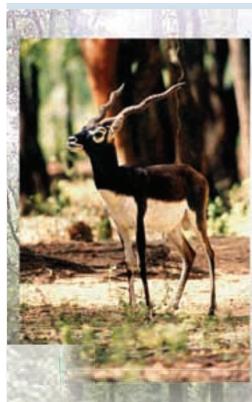


Hair signature pattern of gaur

- Color-Light Brown
- Cuticular Scale Pattern-Imbricate
- Medullary Pattern- Continuous
- Medullary Index-0.428
- Source-WCCB (CR), Jabalpur







Blackbuck (2) Family : Bovidae

Latin Name: Antilope cervicapra Local Name : Kaliyar (Gujarati), Krishna jinka (Telegu), Veli maan (Tamil), Kalweet (Marathi), Hulla karu (Kannada), Hama (Hindi), Mrig, Krishnasar (Bengali) Distribution: Peninsular India Size: Height at shoulder 72-84cm

Weight: 32-42Kg

Diet : Leaf, Grass, Grain, Flowers

Activity Time : Diumal

Threats: Poaching and Habitat loss Body Part Used in Trade: Antler, Skin, Meat.

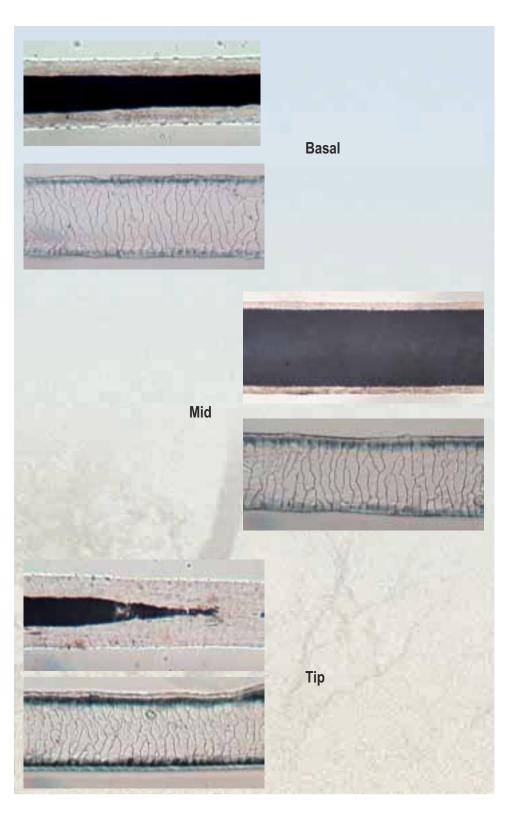
DCNWPA/CITES : Vulnerable/I/III

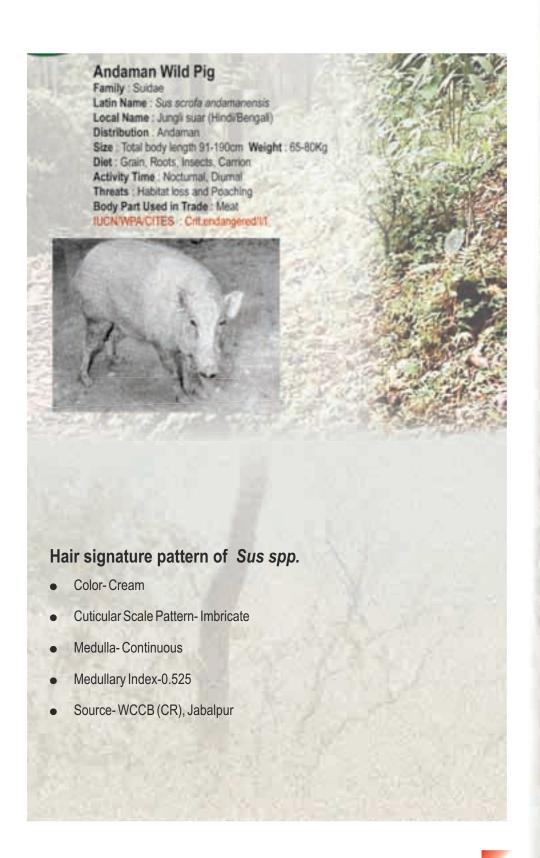
Hair signature pattern Black Buck

- Color-Creamish White
- Cuticular Scale Pattern-Imbricate
- Medullary Pattern-Continuous
- Medullary Index-0.634
- Source-WCCB (CR), Jabalpur

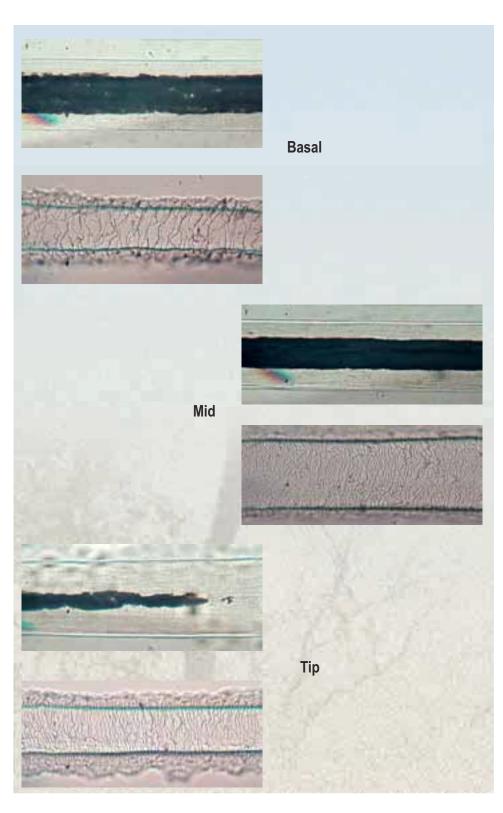














Four-Horned Antelope

Family : Bovidae

Latin Name: Tetracerus quadricomis

Local Name: Naal kombu mann (Tamil), Koondu koori poki (Kannada), Chowsingha (Hindi/Marathi)

Distribution: All over India Size: Height at shoulder 54-66cm Weight: 20Kg Diet: Grass, Leaf Activity Time: Noctumal Threats: Poaching, Cattle grazing

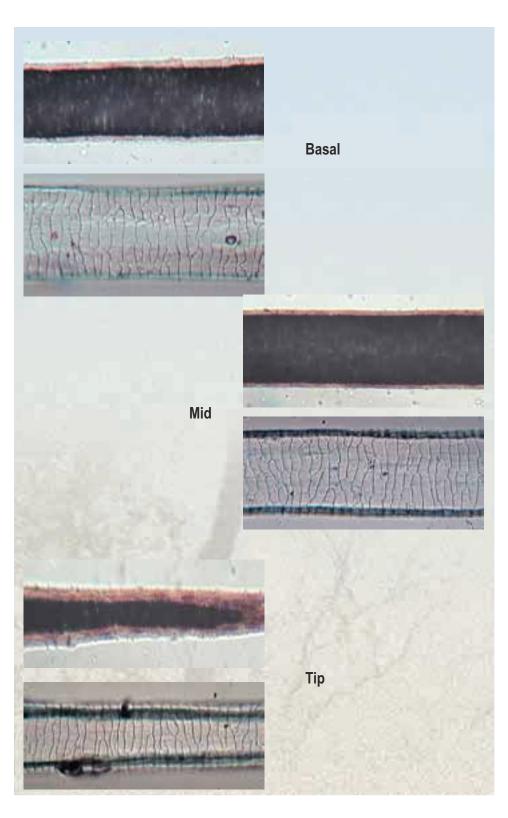
and Habitat loss

Body Part Used in Trade : Skin, Meat IUCN/WPA/CITES : Vuinerable/VIII

Hair signature pattern of Four-horned Antelope

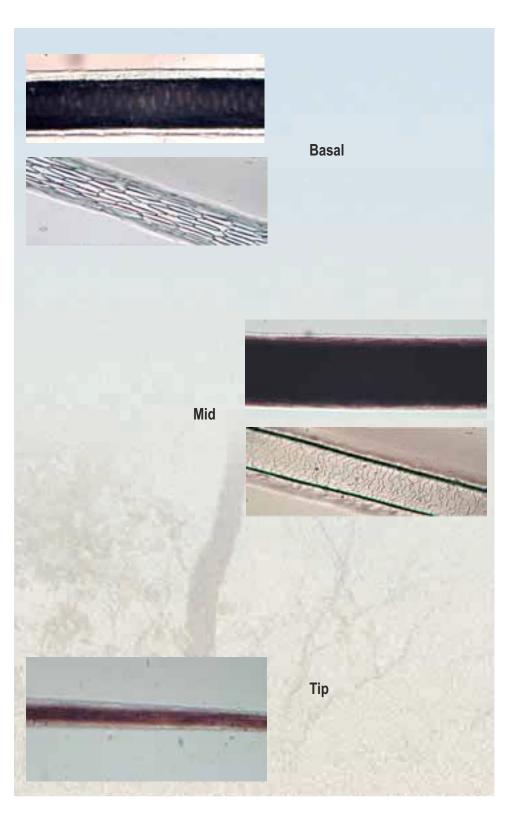
- Color- Creamish Brown with brown tip
- Cuticular Scale Pattern-Imbricate
- Medullary Pattern- Continuous
- Medullary Index-0.884
- Source-WCCB (CR), Jabalpur













(Mizo) Cheeta bagh (Bengali), Pulli puli (Malayalam), Diblya Wagh (Marathi), Tendua, Chita.

Guldar (Hindi) Distribution: All Over India

Size: Total body length 1.84-2.16cm Weight: 40-67Kg Diet: Larger Mammals, Birds,

Reptiles, Cattle, Small Mammals Activity Time: Nocturnal

Threats: Poaching, Habitat loss, Human-animal conflict and Decline in prey base

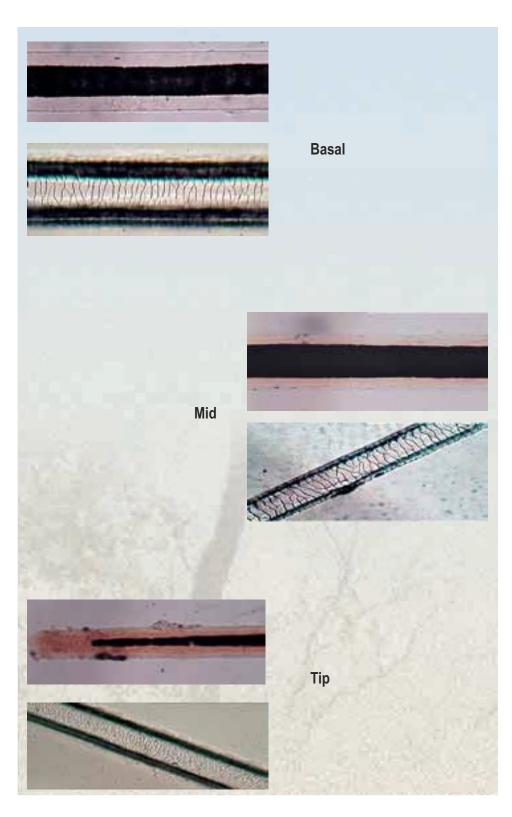
Body Part Used in Trade : Fur skin, Bone, Claw

IUCNAMPAICITES Lower risk/III

Hair signature pattern of Leopard

- Color-Creamish Brown
- Cuticular Scale Pattern-Imbricate
- Medulla-Continuous
- Medullary Index-0.657
- Source-WCCB (HQ), Delhi







Snow Leopard (33)

Family: Felidae Latin Name: Uncia/Panthera uncia Local Name: Sheen-e-suh (Kashmiri), Burhel haye (Bhotia), Barfani cheetah (Urdu), Teku (Naga), Barhal he (Pahan) Distribution: Jammu & Kashmir, Ladakh to Arunachal Pradesh

Size: Total body length 99-131cm

Weight: 36-56Kg

Diet: Larger Mammals, Small Mammals, Birds Activity Time: Nocturnal, Crepuscular

Threats: Poaching, Man-animal conflict, and Decline in prey species

Body Part Used in Trade : Fur skin IUCN/WPA/CITES : Endangered/I/I



Marbled Cat

Family : Felidae

Latin Name : Pardofelis mannorata

Local Name : Unknown

Distribution: Ladakh to Arunachal Pradesh

and Meghalaya

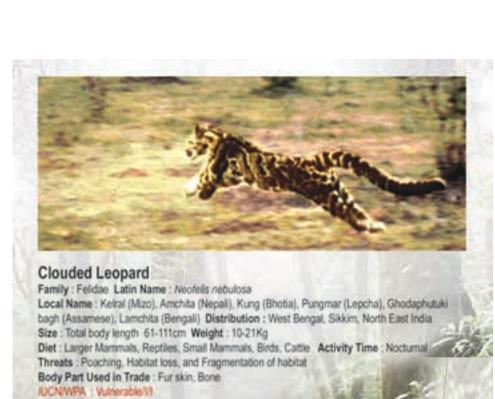
Size: Total body length ~50cm

Weight: 6 Kg Diet: Small Mammals, Birds

Activity Time : Noctumal Threats : Poaching

Body Part Used in Trade: Skin IUCN/WPA/CITES : Endangered/V





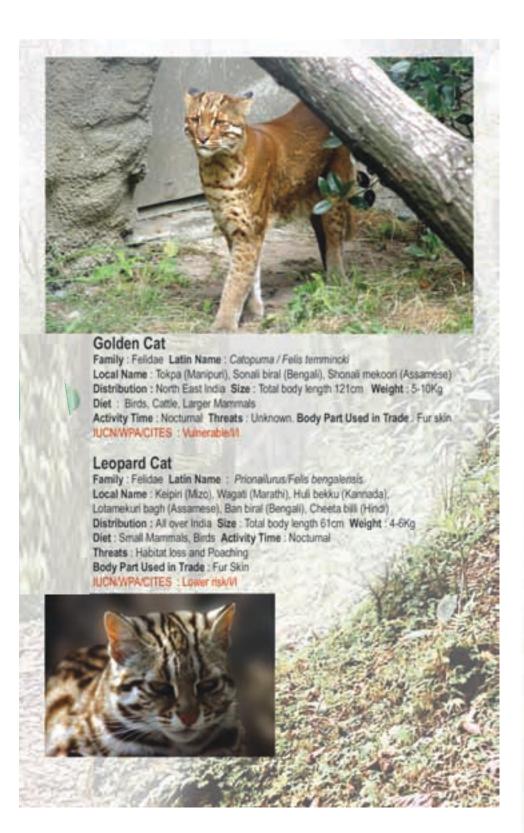
Pallas's Cat (27

Family: Felidae Latin Name: Otocolobus manul Local Name: Ribilik (Ladakhi): Distribution: Ladakh Size: Total body length 49-54cm: Weight: 3-6Kg Diet: Small Mammals, Birds: Activity Time: Crepuscular

Threats: Habitat loss and Poaching Body Part Used in Trade: Fur skin.

JUCN/WPA/CITES : Lower risk/I/II









Desert Cat

Family : Felidae

Latin Name: Felis sylvestris / libyca

Local Name: Ran biladi (Gujarati), Jhengmeno (Kutchhi) Distribution: Western India (Rajasthan Gujrat Maharashtra, Madhya Pradeash) Size: Total body length 48-55cm

Weight: -3Kg

Diet : Small Mammals, Reptiles,

Insects, Birds

Activity Time: Nocturnal, Diumal Threats: Habitat loss and Poaching Body Part Used in Trade: Fur skin IUCNWPA/CITES:: Lower risk/MI

Caracal

Family: Felidae Latin Name: Caracal caracal

Local Name: Siyah ghosh (Persian/Hindi), Hinotro (Kutchhi)

Distribution: Western and Central India (Rajasthan, Gujrat, Punjab, Uttar Pradesh)

Size : Total body length 59-69cm Weight : 15-21Kg Diet : Birds, Larger Mammals, Small Mammals

Activity Time: Noctumal Threats: Habitat loss and Poaching

Body Part Used in Trade : Fur skin IUCN/WPA/CITES : Lower nskill





Family Name : Felidae Latin Name : Lynx lynx/Felis lynx isabellinus

Local Name : Eeh (Ladakhi), Patsamal (Kashmiri)
Distribution : Ladakh Size : Total body length 86-89cm
Weight : 19-22Kg Diet : Small Mammals, Larger Mammals, Birds
Activity Time : Crepuscular Threats : Habitat loss and Poaching

Body Part Used in Trade : Fur skin IUCN/WPA/CITES : Lower risk/VI



Fishing Cat

Family : Felidae

Latin Name: Prionallurus viveminus Local Name: Kattanpul (Malayalam), Meseka (Assamese), Meccho biral, Baghrol (Bengali), Khupya bagh (Hindi) Distribution: North, East, North East

India and Western Ghat
Size: Total body length 71cm
Weight: ~6.5Kg. Diet: Fish, Birds,
Gephalopods, Small Mammals
Activity Time: Nocturnal

Threats: Habitat loss, Poaching and

Fishing activities

Body Part Used in Trade : Fur skin IUCN-WPA/CITES : Vulnerable/UII





Rusty Spotted Cat

Family: Felidae Latin Name: Prionallurus rubiginosus

Local Name: Thurumban poocha (Malayalam), Chiruta pilli (Telegu), Namali pelli (Tamil), Kaadu bekku (Kannada), Bitari Billi (Gujarati)

Distribution: Peninsular India Size: Total body length 36-47cm Weight: 1-1.5Kg

Diet : Small Mammals Activity Time : Nocturnal

Threats: Poaching, Habitat loss and Road kills Body Part Used in Trade: Fur skin

IUCN/WPA/CITES: Vulnerable/III

Small-Clawed Otter

Family: Musterlidae Latin Name: Amblonyx cinereus Local Name: Neeru nai (Kannada), Nirukaka (Telegu),

Neemai (Tamil/Malayalam), Shanamba (Manipun), Udbilao (Hindi)

Distribution: Eastern and Southern India

Size: Total body length 44-60cm Weight: ~5Kg Diet: Fish, Crustaceans, Amphibians, Small

Mammals, Birds Activity Time : Diurnal, Noctumal, Crepuscular

Threats: Poaching, Habitat loss, Pollution Body Part Used in Trade: Meat, Skin

JUCN/WPA/CITES Vulnerable/III



Salim Ali's Fruit Bat

Family : Pteropodidae Latin Name : Latidens salimalii

Local Name : Chamkadad (Hindi), Badur, Chamchike (Bengali), Chamachidu (Gujrati)

Distribution : Tamil Nadu

Size: FA 6.5-6.9cm HBL 10.1-10.9 cm

Weight: Unknown Diet: Fruits

Activity Time : Noctumal Threats : Habitat loss

Body Part Used in Trade : Meat IUCN/WPA/CITES :: Vulnerable/M



Wronghton's Free Tailed Bat

Family : Molossidae

Latin Name : Otomops wroughtoni Local Name : Chamkadad (Hindi), Badur, Chamchike (Bengali), Chamachidu (Gujrati)

Distribution : Kamataka

Size: FA 6.2-6.7cm HBL 8.6-9.9 cm

Weight Unknown Diet Insects Activity Time Nocturnal Threats Habitat loss

Body Part Used in Trade : Meat TUCN/WPA/GITES : Vulnerable/III





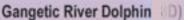


Snubfin/Irrawaddy Dolphin [3A]
Family : Delphinidae Latin Name : Orcaella brevirostris Local Name : Susuk (Bengali) Distribution : Andhra Pradesh, Tamilnadu, Orissa, Estuaries of River Ganges and Krishna Size: Total body length 2.2-2.6m Weight: 91-151Kg Diet : Fish, Crustaceans Activity Time : Noctumal

Threats: Habitat destruction, Fishing activity, Poaching, Pollution

Body Part Used in Trade : Bone, Jaw, Skin, Fat

IUCN/WPA/CITES : Data deficient/I/II



Family : Platanistidae Latin Name : Platanista gangetica Local Name: Bhoolan, Sunsar (Sindhi), Hiho, Seho (Assamese),

Susuk (Bengali), Susu (Hindi) Distribution: River Ganges, Brahmaputra, Mahanadi and

their tributaries Size: Total body length 1.8-2.6m

Weight: 71-86Kg Diet: Fish, Crustaceans Activity Time: Noctumal

Threats: Pollution, Habitat destruction, Poaching, Large dams and Fishing nets Body Part Used in Trade : Jaw, Bone, Skin, Fat

IUCN/WPA/CITES : Endangered/I/I





Finless Porpoise

Family: Phocoenidae Latin Name: Neophocaena phocaenoides

Local Name: Molagan (Tamil), Bhulga (Marathi)

Distribution: Kerala, Tamilnadu, Karnataka, Goa, Orissa and Sunderbans

Size: Total body length 1,5-190m

Weight: 71-86Kg Diet: Crustaceans, Fish. Cephalopods

Activity Time: Noctumal Threats: Habitat destruction, Fishing nets and Poaching

Body Part Used in Trade : Bone, Skin, Fat IUCN/WPA/CITES : Data deficient///

Dugong

Family : Dugongidae Latin Name : Dugong dugon

Local Name : Kadal pasu (Malayalam) Distribution : Kerala, Tamilnadu, Kamataka, Gujrat,

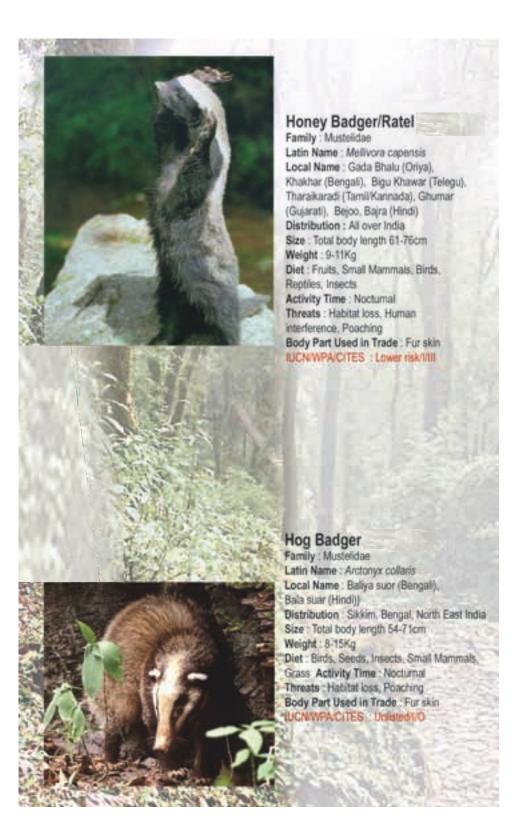
Andaman Nicobar Size: Total body length 2.4-3m Weight: 141-175Kg

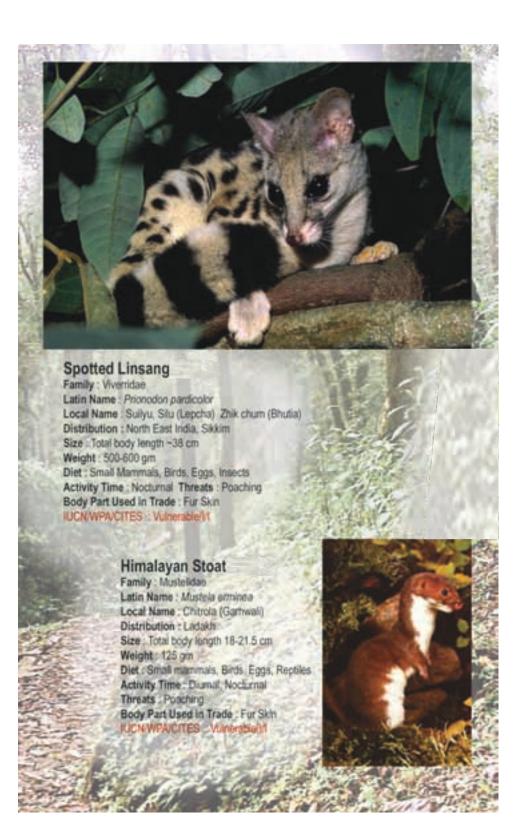
Diet : Grass, Aquatic plants Activity Time : Diurnal Threats : Habitat destruction, Fishing nets and Poaching















Latin Name : Equus oneger/E hemionus Local Name : Ghudkhar (Gujarati), Khur (Hindi)

Distribution: Gujrat (Rann of Kutch)
Size: Height at shoulder 111-119cm
Weight: 251-291Kg Diet: Grass, Grain
Activity Time: Diumal, Noctumal (feeding)
Threats: Habitat disturbance, Poaching

and Competition from livestock

Body Part Used in Trade : Skin, Meat

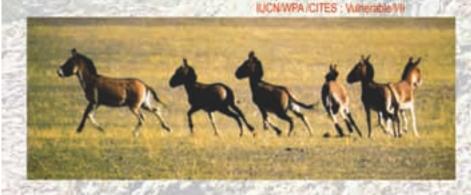
IUCNWPA /Ones : Vulnerable///

Tibetan Wild Ass

Family : Equidae Latin Name : Equius klang

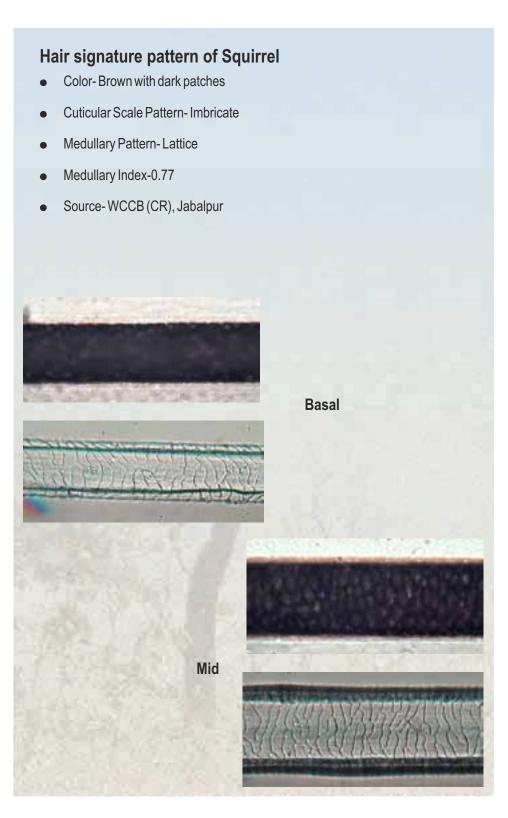
Local Name: Kiang/Kyang (Ladakhi). Distribution: Jammu & Kashmir and Sikkim Size: Height at shoulder 136-141cm Weight: 251-299Kg Diet: Grass

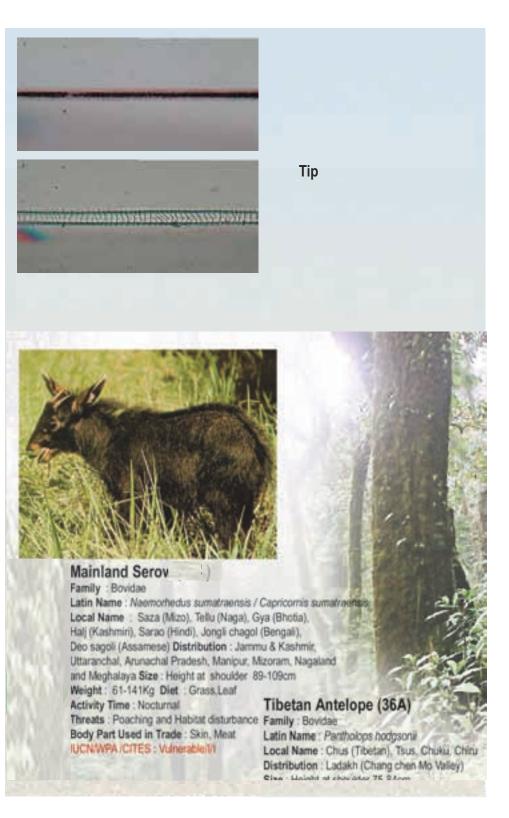
Activity Time : Diumal Threats : Competition from Ivestock, Poaching and Disease Body Part Used in Trade : Skin, Meat





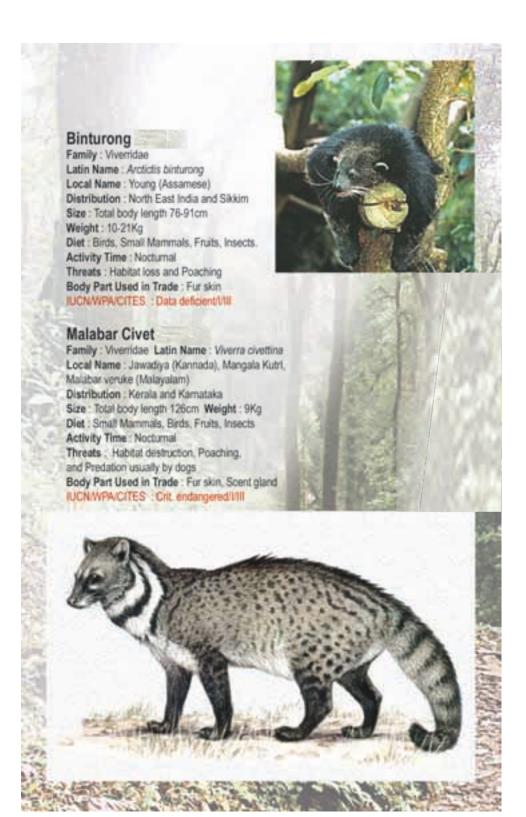




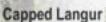












Family: Cercopithecidae

Latin Name: Trachypithecus pileatus/Presbytis pileatus

Local Name : Ngau (Mizo), Bilaspuri (Manipuri), Tongo (Khasi), Rangol (Garo), Golija Makhre (Bodo), Tupimuria (Assamese) Distribution : Assam,

Arunachal Pradesh, Manipur, Mizoram Size: Total body length 49-71cm

Weight: 10-12Kg Diet: Leaf, Fruits, Flowers Activity Time: Diurnal

Threats: Habitat loss and Poaching Body Part Used in Trade: Skin, Bone, Skull IUCNWPA/CITES: Endangered/VI



Ailurus fulgens

Common name: Lesser or Red Panda, IUCN/WPA/CITES: Endangered / I /App-I.

Body morphology:

The lustrous coat is a rich reddish brown colour on the back and black on the legs. The face is rounded and predominantly white with reddish brown 'tear marks' running from the corner of each eye to the

mouth. The long bushy tail is marked with 12 alternating red and buff rings. Large erect pointed ears. Stumpy muzzle. Legs short and the soles of the feet are covered with thick white hair to provide warmth. **Natural habitat:** Red Panda inhabits temperate montane forests at elevations from 1500m to 3500m above sea level where there is a thick bamboo understory. **Threats:** Habitat loss and poaching.

Body parts in trade:

Red Pandas are hunted for their fur, especially for the highly-valued bushy tails from which hats are produced. In Yunan district of China, the fur is often used for local cultural ceremonies and in weddings the bridegroom traditionally carries the hide. Red Pandas are often sold to private collectors at exorbitant price.

Scientific name: Pantholops hodgsonii

Common name: Tibetan Antelope, IUCN/WPA/CITES: Endangered/I /App-I.

Body morphology:

A rufous brown antelope, slightly larger than Blackbuck, with black face and white underparts. A black stripe runs down the front of each leg. Body covered with thick fur, one of the finest wool of animal kingdom. Muzzle swollen in males and nostrils furnished inside with an extensive sac. Horns in male, long, erect, arising close to each other, slightly curved forward, ringed in front but not behind. Females without



horns. **Natural habitat:** The Tibetan antelope inhabits harsh steppe areas of Tibetan plateau at elevations of 3,700 to 5,500 metres above sea level. **Threats:** Poaching and habitat loss.

Body parts in trade:

The principal cause behind poaching of this antelope is to

supply the 'shahtoosh' trade; the production of shawls made from the fine, warm wool of this species. Up to five antelope are needed to produce a single shawl and these can fetch up to US\$ 15,000 on world markets. The antlers are also kept as trophy.

Shahtoosh Shawl

General Information

- Shahtoosh a Persian word meaning "Pleasure of Kings"- was the name given to a specific kind of shawl, which was woven with the down hair of the Chiru or Tibetan Antelope.
- Shahtoosh is soft, thin and less dense. Delicate hair measures between 9 and 11 micrometers.





- Shahtoosh are so fine that an average size shawl can be passed through a wedding ring.
- The Tibetan Antelope is fawn to reddish brown in color on the back, and beige or
 off white on the underside.
- A distinct but very fine diamond weave pattern is sometimes visible with minifying glass.
- Long hairs protruding from shahtoosh are not visible.
- Few short, light colored guard hairs are visible in the shawl.



Weight: 200 gms Surface: Smooth



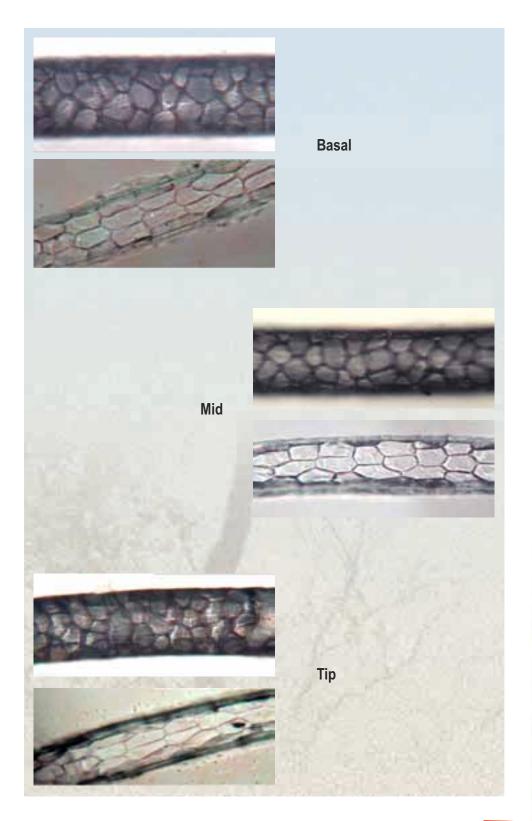


Identification Characteristic of the sample

- The sample is characterized by crew cut fringe.
- Short, light colored guard hairs are visible.
- The shawl is soft, thin and light.
- The shawl passed through a wedding ring.

Hair signature pattern of Panthelope hodgsonii

- Color-Light Brown
- Cuticular Scale Pattern-Imbricate or flattened scales with narrow margin
- Medulla-Lattice
- Medullary Index->0.9
- Source-WCCB (HQ), Delhi









Fin Whale

Local Name: Devmasa (Marathi), Thimingilum(Tamil/Malayalum), Thimingila (Kannada) Family: Belaenopteridae Latin Name: Balaenoptera physalus Distribution: Worldwide from polar to tropical waters. Migrates from temperate feeding ground in summer towards tropics in winter. However, a few isolated resident populations are also known to occur Size: TL: male: 18-22.5m female: 18.5-24.5m Weight: 32-82tons Diet: Krills, copepods and squids Activity time: Noctumal Threats: Trade, Predation, Hunting, Whaling on large scale in open oceanic waters In Trade: Meat, Fat, Liver Oil IUCNWPA/CITES: Entil/App. I

Blainville's Beaked Whale

Local Name: Not known Family: Ziphidae Latin Name: Mesoplodon densirostris
Distribution: World wide in tropical to subtropical oceanicwaters. In Indian waters the
specieshas been reported from Nicobor Islands Size: TL: male: 4-6m female: 4-5m
Weight: Adult: 750-1055kg Diet: Squides and fishes Activity time: Nocturnal Threats:
Poisoning, Accidedental deaths in small cetacean fishery, Secondary picsoning due to
DDT and PCB contamination of its food (Squids) In Trade: Meat, Fat, Liver Oil
IUCN/WPA/CITES: Lower risk/IU/App. II





Pygmy Sperm Whale

Local Name: Not known Family: Physeteridae Latin Name: Kogia breviceps Distribution: Throughout the tropical and warm temperate oceans of the world. From the Indian coast, stranding of Pigmy Sperm Whales have been reported from Chennai, Vishkhapatnam and Waltair on east coast, while from Thiruvananthapuram (Trivandum), Kerala, on west coast Size: TL: 2.5-3.5m Weight: 2.8m long Pigmy Sperm Whale weights about 415kg Diet: Squides and Crustaceans Activity time: Nocturnal Threats: Accidental mortality in fishing gillnets and Deaths due to accidental intake of plactic bags, Hunting In Trade: Meat, Fat, Oil IUCN/WPA/CITES: Lower risk/III/App. II

Dwarf Sperm Whale

Local Name: Not available Family: Physeteridae Latin Name: Kogia simus Distribution: Worldwide, found in temperate, subtropical and tropical waters. It is more inshore along the edge of the continental shelf than Pygmy Whale. In Indian waters it has been reported from Thiruvananthapuram (Trivandrum) and Vishakhapatnam Size: TL:~2.50m Weight: 185-355kgs Diet: Data Deficient Activity time: Nocturnal Threats: Human interference, Hunting, Fishing, Accidental mortality in gill nets etc. In Trade: Meat, Fat, Oil IUCN/WPA/CITES: Lower risk/III/App, II









Sperm Whale

Local Name: Not available Family: Physeteridae Latin Name: Physeter macrocephalus Distribution: Worldwide. Sperm Whale females and young males are confined between 450N and 450S latitudes while mature males travel upto Arctic and Antarctic oceans. Reported from east and west coasts of India and also from Andaman and Nicobar Islands Size: TL: Male: ~15m; female: ~10m Weight: ~37.5tons Diet: Squids and mesopelagic species. Activity time: Noctumal Threats: Human Interference, Hunting, Collision with ships In Trade: Meat, Fat, Liver Oil TUCN/WPA/CITES: Lower risk/III/App, II

False Killer Whale

Local Name: Not available Family: Delphinidae Latin Name: Pseudorca crassidens Distribution: Worldwide, in tropical and temperate oceans including Indian Ocean. recorded from Kozikode, Thiruvananthpuram (Trivandrum), Gulf of Cambay, Cape Comorin, Port Blair and Campbell bay in Indian waters Size: TL: Male: 4-9.5m; female: 3.7-5.2m Weight: Maximum 1.5tons Diet: Cephalopods and Large fishes Activity time: Noctumal Threats: Trade, Gilnet fishery, Collision with ships. In Trade: Meat, Fat, Liver Oil IUCNWPA/CITES: Lower risk/III/App, II





Sie Whale

Local Name: Not available Family: Belaenopteridae Latin Name: Balaenoptera borealis Distribution: Worldwide. Found in temperate as well as in sub-tropical oceanic waters. They undertake annual migration from lower altitudes (wintering zone) to high altitude zone (feeding zone). They are found primarily south of latitude 300 in winter and 400 in summer and autumn. Indian ocean and Arabian sea form part of migratory pathway for the species, which comes to tropical waters for calving. Not very common in Indian waters. Size: TL: male: 13-18m female: 13.5-21.5m Weight: Not known Diet: Pelagic and small fishes Activity time: Noctumal Threats: Trade, Hunting, Whaling on large scale in pelagic region In Trade: Meat, Body Fat, Liver Oil IUCN/WPA/CITES: Lower risk/IWApp. I

Blue Whale

Local Name: Devmasa (Marathi), Thirmingilum(Tamil/Malayalum), Thirmingla (Kannada)
Family: Belaenopteridae Latin Name: Balaenoptera musculus Distribution:
Worldwide. From polar to tropical waters. Living in polar waters during summer, migrating towards equator in winter. One population has spread and separated from the one in southern hemisphere and lives in north Indian ocean waters at all the times of the year
Size: TL: 22-36m Weight: 85-115tons: Diet: Euphausids (Krills), Amphipods, Copepods and Cephalopods. Activity time: Noctumal Threats: Human interference, Hunting uncontrolled whaling on large scale in open oceanic waters In Trade: Meat, Fat, Liver Oil IUCN/WPA/CITES: Lower risk/II/App. I









Minke Whale

Local Name: Devmasa (Marathi) Family: Belaenopteridae Latin Name: Balaenoptera acutorostrata Distribution: World wide, found in temperate and polar waters. Gulf of Mannar in Indian waters. report of carcasses washed off shore on west and southeast cost of India, Marine from Size: TL: male: 7-9m, female: 7.5-11m Weight: Whales of 6m length weight about 2.0 to 2.7 metric ton Diet: Pelagic and small fishes Activity time: Noctumal Threats: Trade, Predation, Hunting In Trade: Meat, Body Fat, Liver Oil IUCNWPA/CITES: Lower risk/IU/App.I

Bryde's Whale

Local Name: Devmasa (Marathi) Family: Belaenopteridae Latin Name: Balaenoptera edeni Distribution: Bryde's Whale has a circum-equitorial distribution in tropical and warm waters. In Indian waters found along Arabean sea, Bay of Bengal shores and also in Indian ocean. There is a population in Bay of Bengal from Sri Lanka to straits of Malacca Size: TL:male: 12.5-14.5m, female: 12.8-15.8m Weight: Average: 13.5ton Diet: Pelagic and small fishes Activity time: Nocturnal Threats: Human interference, Hunting, Costal and pelagic whaling In Trade: Meat, Body Fat, Liver Oil







Melon-headed Whale

Local Name: Not available Family: Delphinidae Latin Name: Peponocephala electra Distribution: Worldwide, Indian waters: Indian ocean, Mekran, Vishakhapatnam Size: TL: male: -2.50cm, females: 2.55cm Weight: Not known Diet: Small fishes and Squids Activity time: Nocturnal Threats: Use of large gilnets for fishing in Trade: Meat, Body Fat, Liver Oil IUCN/WPA/CITES: Lower risk/III/App. II

Common Dolphin

Local Name: Devmasa (Marathi), Sus/Dolphin (Hindi) Family: Delphinidae

Latin Name: Delphinus delphis Linneaus Distribution: Costal offshore, Indian ocean,
Goa, Malabar coast, Andaman Island Size: TL: male: -2.3cm, female: 2cm; Weight:
30kg Diet: Fishes and Squids Activity time: Nocturnal Threats: Human interference,
Trade, Predation, Pollution, Hunting, Fishing, Over exploitation, Accidental traping in
gillnets interference In Trade: Live animals, Meat, Body Parts, Animal Food, Body Fat,
Liver Oil: IUCN/WPA/CITES: Lower risk/II/App, II









Pantropical Spotted Dolphine

Local Name: Not available Family: Delphinidae Latin Name: Stenella attenuasta Distribution: Worldwide in tropical and subtropical waters. In Indian waters, recorded from Sundarbans Size: TL: male: -2.50cm, females: 2.55cm Weight: Not known Diet: Small fishes and Squids Activity time: Nocturnal Threats: Use of large gillnets for fishing In Trade: Live Animals, Meat, Fat, Liver Oil

IUCN/WPA/CITES: Lower risk/II/App. II

Spinner Dolphin

Local Name: Not available Family: Delphinidae Latin Name: Stenella longirostris (Gray)
Distribution: Worldwide including Indian Ocean. In Indian waters: Malbar coast, Quilon,
Lakshadweep Islands Size: TL: male: ~2m, females: 1.75m Weight: ~2m long dolphins
weights about 55-60kg Diet: Fishes and Squids Activity time: Noctumal Threats: Human
interference, Trade, Pollution, Hunting, Use of gillnets in fishery on large scale, Excessive
tourism in Dolphin habitats In Trade: Live Animals, Meat, Fat

IUCN/WPA/CITES: Lower risk/II/App. II





Hump-Backed or Plumbeous Dolphin

Local Name: Punnan adee (Malyatam), Devmasa (Marathi) Family: Delphinidae Latin Name: Sousa chinensis Distribution: Worldwide. Marine coastal and inshore waters from South Africa to West of Indonesia and Chinise sea waters through the Indian marine waters Size: TL: male: -3m, fe males: -2.50m Weight: 1.0m long weighted 37kg, while 2-3m long weighted 139kg Diet: Pelagic and benthic fishes Activity time: Noctumal Threats: Human interference, Pollution, Loss of habitat, Destruction of Mangrove areas, Sittation, Gillnet fishing, Hunting In Trade: Live Animals, Meat, Body parts, Oil extraction, Meat used as shark balt (UCN/WPA/CITES: Entit/App. 1

Bottle-nosed Dolphin

Local Name: Devmasa (Marathi) Family: Delphinidae Latin Name: Tursiops truncatus (Montagu) Distribution: Worldwide. West coast and Andaman waters Size: TL: male: 2.40-3.85m, females: 2.35-3.70m Weight: Adults: -175kg Diet: Fishes or cephalopods Activity time: Noctumal Threats: Human interference, Loss of habitat, Trade, Predation, Pollution, Hunting, Gillnets and Gears for large scale fisheries, Excessive tourism in Dolphin habitat In Trade: Live Animals, Organs, Meat, Body parts, Collection for display and scientific purpose etc. IUCNWPAICITES: En/IIIApp.II







Mammals included under the Schedule II, III & IV of the Wildlife (Protection) Act, 1972



Rhesus Macaque

Local Name: Bandor, Markot (Bengali), Bandar (Hindi), Makda (Gujarati) Family: Cercopithecidae Latin Name: Macaca mulatta Distribution: All over Northern India including Northeast, except Deserts and high Himalaya, North of river Tapti and Godavari (upto 2,400m) Size: Total body length: 45-65 cm Weight: -10 kg Diet: Fruits, Insects, Leaf, Bark, Roots, Seeds, Flowers Activity time: Diurnal Threats: Habitat loss, Urban migration, and Poaching In Trade: Live Animals, Body parts for traditional medicine, Skull, Medical research IUCN/WPA/CITES: Lower risk //III/App.II.

Bonnet Macaque

Local Name: Korangan (Malayalam), Makad (Marathi), Kapi, Manga (Kannada), Pati makada (Onya), Vella korangu (Tamil), Kothi (Telegu) Family: Cercopithecidae Latin Name: Macaca radiata Distribution: South India, Mumbai, in the west to River Godavari Size: Total body length: 36-67 cm Height: -8 kg Diet: Fruits: Insects, Leaf, Bark, Roots; Seeds, Flowers Activity time: Diurnal Threats: Habitat loss, Urban migration and Poaching In Trade: Live Animals, Body parts for traditional medicine, Skull, Medical research











Assamese Macaque

Local Name: Bandor (Assamese), Pio (Bhutia), Makre dow (Garo), Asamia bandar (Hindi), Sahu (Lepcha), Zawng (Mizo), Tefi (Naga) Family: Cercopithecidae Latin Name: Macaca assamensis Distribution: From Himachal Pradesh eastward to Northeast India states through West Bengal and Sikkim in India. Southwards it extends to Sundarbans Size: HBL: 40-52cm Weight: 4.5-13kg Diet: Fruits, Leaf, Insects, Grain, Roots, Flowers Activity time: Diumal Threats: Agricultural and farming, Habitat loss, Trade, Hunting, Corridor loss, Developmental activities etc. In Trade: Live Animals, Meat, Body parts for traditional medicine, Skull IUCNWPA/CITES: Lower risk/III/App. II

Pig-Tailed Macaque

Local Name: Gahori nejiya bandor (Assamese), Bara haleji bandar (Bengali), Pico (Garo/Karbi), Suar poonch bandar (Hindi), Zawng muat (Mizo), Kangh (Naga) Family: Cercopithecidae Latin Name: Macaca nemestrina Distribution: Throughout Northeast India, South of river Brahmaputra (up to 2,000m) Size: HBL: 40-77 cm Tail: 13-28cm Weight: 4-14kg Diet: Fruits, Leaf, Insects, Grain, Roots Activity time: Diumal Threats: Habitat loss and Poaching In Trade: Live Animals, Meat, Body parts, Skull, Skin etc RUCN/WPA/CITES: Vulnerable/III/App. II





Stump-tailed Macaque

Local Name: Senduri bandor (Assamese), Makre khimidonza (Garo), Sinduri bandar (Hindi), Zawng hmalsen (Mizo), Chantee (Naga) Family: Cercopithecidae Latin Name: Macaca arctoides Distribution: South of river Bramhaputra in Northeaster India including Tripura Size: HBL: 48-72 cm, Tail: 4-10cm Weight: -12 kg Diet: Fruits, Leaf, Grain, Roots Activity time: Diurnal Threats: Habitat loss and Poaching In trade: Live Animals, Meat, Body parts for traditional medicine, Skull, Skin, Bio-medical research IUCN/WPA/CITES: Vulnerable //III/App, II

Hanuman Langur

Local Name: Koda (Kodava), Hanuman (Hindi/Marathi/Bengali/Assamese), Wandra (Gujarati), Dodda manga (Kannada), Vella manthi (Tamil), Kondamucchu (Telegu), Wandur (Kashmiri), Hanuman makada (Oriya) Family: Cercopithecidae Latin Name: Semnopithecus enfellus Distribution: Throughout India, except upper Himalya (up to 300 m.) NE India, and arid/desert areas of Gujarat and Rajasthan Size: Total body length: 62-77cm Weight: –18.5 kg Diet: Fruits, Leaf, Flower Activity time: Diumal Threats: Habitat loss and Poaching In trade: Live Animals, Body parts for traditional medicine, Skull, Skin, Medical research (UCN/WPA/CITES: Lower risk/Ill/App.)









Sambar

Local Name: Tekha (Naga), Sambar (Hindi/Marathi/Bengali), Kaduve (Kanada), Kadama (Kodava), kadaa man (Tamil), Kezha maan, Mlave (Malayalam), Khar pohu (Assamese), Sabar (Gujrati), Sazuk (Mizo), Kadathi (Telegu) Family: Cervidae Latin Name: Cervus unicolor Distribution: Throughout India, except Deserts, Mangroves and High mountains Size: Height at shoulder: -155 cm Weight: 250-350 kg Diet: Fruits, Leaf, Grass, Feeds in the night Activity time: Diurnal, Noctumal Threats: Habital loss, Poaching and Disease In trade: Antier, Meat, Pelt, Bone, Head Mount IUCN/WPA/CITES: Lower risk

• Sambar antlers are large, rugged typically rosin, the brow lines being simple and

the beans forked at the tip. The antler may exceed 101 cm (40 in).

 A sambar antler is typically three tined and the outer top tine is usually the continuation of the main beam while the inner top tine is somewhat shorter.

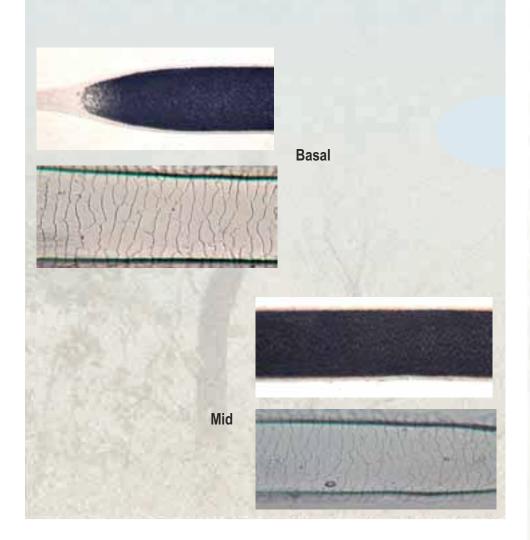
- Sambar antlers have very little central pith, making it strong and heavy, being mainly bone material
- The antler take 4-6 months for development, during which they are covered with sensitive integument coated with hair.





Hair signature pattern of Sambar

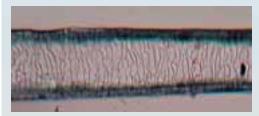
- Color- Golden Brown
- Cuticular Scale Pattern-Imbricate
- Medullary Pattern-Lattice
- Medullary Index-0.91
- Source-WCCB (CR), Jabalpur







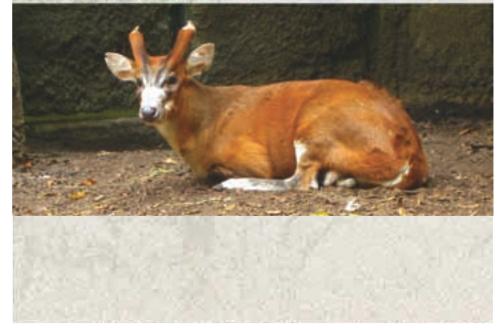




Tip

Indian Muntjac

Local Name: Kutra (Bengali), Chize (Naga), Kutra (Hindi), Kadu koorie (Kanada), Bhekar (Marathi), Kelaiyadu (Tamil/Malayalam), Shaji (Manipuri), Sagoli pohu (Assamese), Chize (Naga), Sakhi (Mizo) Family: Cervidae Latin Name: Muntiacus muntjak Distribution: Throughout India, except Jammu and Kashmir, Himalaya (up to 2,500m) and arid/desert areas of Gujarat and Rajastan. Size: Height at shoulder: 55-80 cm Weight: -21 kg Diet: Fruits, Vegetation, Grass, feeds in the night Activity time: Diurnal, Crepuscular, Noctumal Threats: Habitat loss and Poaching In trade: Skin, Meat, Bone IUCN/WPAICITES: Lower risk/IIII/NC





Hog Deer

Local Name: Kaala khatia (Bengali), Para (Hindi/Punjabi), Horina pohu, Hugori pohu (Assamese), Kharsa (Manipuri) Family: Cervidae Latin Name: Axis porcinus Distribution: Terai and Duars, from Uttaranchal to Assam, Mizoram and Manipur Size: Height at shoulder: 65-75 cm Weight: ~43 kg Diet: Leaf, Grass, Fruits, Feeds in night Activity time: Diurnal, Noctumal Threats: Habitat loss and Poaching In trade: Skin, Meat: IUCN/WPA/CITES: Lower risk/IIIINC

Spotted Deer

Local Name: Cheetal (Bengal/Hindi/Marathi), Saraga jinke (Kannada), Pulli maan (Tamil/Malayalam), Chukala jinka (Talagu) Family: Cervidae Latin Name: Axis axis Distribution: Throughout India, except Jammu & Kashmir, high Himalaya, Northeastern Himalaya and Deserts Size: Height at shoulder: 90 cm Weight: 85 kg Diet: Leaf, Grass, Fruits, Flowers Activity time: Diurnal, Noctumal Threats: Habitat loss and Poaching In trade: Skin, Antier, Meat, Bone IUCN/WPA/CITES: Lower risk/III/NC







General Information

- Its antlers which it sheds annually, are usually three-pronged and curve in a lyre shape and may extend to 75 cm (2.5 ft).
- A chital stands about 90 cm (3 ft) tall at the shoulder and masses about 85 kg (187
 lb). lifespan is around 20-30 years.
- Males sporting hard antlers are dominant over those in velvet or those without antlers, irrespective of their size and other factors..
- Geographical distribution: India, Srilanka, Nepal and Bangladesh.

Physical features of the sample

Weight: 139 gms

Length: 14.9 cms

Thickness : 2 cms

Color : Brown

Mark of Injury : Nil.

Surface : Rough and uneven.

Identification Characteristic of the sample

- The antlers branch to six points and sweep back into an upward curve..
- Antler curve in lyre shape..
- Woody appearance.







Nilgai

Local Name: Nilgai, Nil (Hindi), Roz (Punjabi/Haryanvi), Rohu (Marathi), Roj (Guirati)
Family: Bovidae Latin Name: Boselaphus tragocamelus Distribution: Throughout
India, except Deserts, West Bengal and Northeast Size: Height at shoulder: 130-150 cm
Weight: 170-240 kg Diet: Leaf, Grass, Fruits, Flowers, Grains Activity time: Diurnal,
Noctumal Threats: Habitat loss and Poaching In trade: Meat, Pelt, Bone
IUCNWPA/CITES: Lower risk/III/NC

Goral

Local Name: Goral (Hindi), Pij. Pijur, Rai (Kashmiri), Ra giyu (Bhotia), Deo sagoli (Assamese), Ram chagol (Bengali), Sathar (Mizo) Family: Bovidae Latin Name: Naemorhedus goral Distribution: Himalayan region, Nagaland, Manipur and Mizoram Size: Height at shoulder: 67-72 cm Weight: 27-40 kg Diet: Leaf, Grass, Fruits Activity time: Diurnal, Noctumal Threats: Habitat loss and Poaching In trade: Meat, Skin IUCN/WPA/CITES: Lower risk /IIII/App. I







Wild Boar

Local Name: Jungli suar (Hindi), Buno suor (Bengali), Ran dukkar (Marathi), Kadu handi (Kannada), Kattu panni (Malayalam/Tamil), Vawk (Mizo) Family: Suidae Latin Name: Sus scrofa Distribution: All over India, except Deserts, high Himalayas and Jammu & Kashmir Size: TBL: 85-175 cm Weight: ~100 kg Diet: Roots, Grains, Insects, Reptiles and Carrion Activity time: Diurnal, Noctumal Threats: Poaching In trade: Meat, Body parts, Bristle IUCN/WPA/CITES: Lower risk/IIII/NC

Jackal

Local Name: Gidar (Hindi), Shaal (Kashmiri), Bilua (Oriya), Shiyal (Bengali/Gujrati), Gulle naree (Kannada), Kurukkan (Malayalam), Nakka (Telegu) Family: Canidae Latin Name: Canis aureus Distribution: All over India upto 3,000 feet Size: BL: 70-80 cm Weight: ~15 kg Diet: Birds. Reptiles. Insects, Small mammals, Fruits and Carrion Activity time: Diumal, Nocturnal Threats: Habitat loss and Poaching In trade: Skin, Bone IUCN/WPA/CITES: Lower risk/III/App. III





Striped Hyena

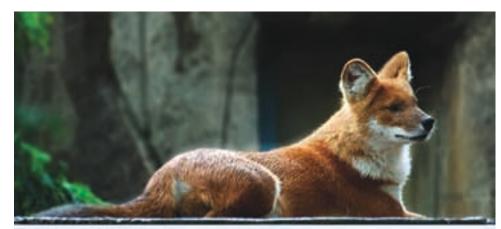
Local Name: Lakkad bagga (Hindi), Adh bagha (Bengali), Taras (Marathi), Kadu keeruba (Kannada), Kazhutha puli (Malayalam/Tamil), Heta bagha (Oriya) Family: Hyaenidae Latin Name: Hyaena hyaena Distribution: All over India, except Northeast, high Himalayas and Jammu & Kashmir Size: TBL: ~175 cm Weight: 30-40 kg Diet: Cattles, Large mammals and Carrion Activity time: Noctumal Threats: Poaching, Habitat loss and Road kills In trade: Skin, Body parts for traditional medicine IUCN/WPA/CITES: Lower risk/III/NC

Wild Dog

Local Name: Dhole (Hindi/Bengali), Ramkum (Kashmiri), Balia kukura (Oriya), Kutra (Gujrati), Kadu nai (Kannada), Chen nai (Malayalam/Tamil), Resu kukka (Telegu), Rang kukur (Assamese), Huithou (Manipuri), Farra (Ladakhi) Family: Canidae Latin Name: Cuon alpinus Distribution: All over India except part of Gujrat, Rajasthan, Punjab and Jammu & Kashmir Size: TBL: ~90 cm Weight: ~16 kg Diet: Birds, Small mammals, Large mammals and Cattles Activity time: Diumal, Noctumal Threats: Habitat loss, Man animal conflict and Poaching. In trade: Skin IUCN/WPA/CITES: Vulnerable/III/App. II







Himalayan Red Dog

Local Name: Ram Kutta (Bengali), Bhaosa, Bhunsa, Buansu (Himalayas), Rang Kukur (Assamese), Huithou (Manipuri) Family: Canidae Latin Name: Cuon alpinus primaevus (Hodgson) Distribution: Entire Himalayan range from Kumaon to Sikkim, West Bengal, Assam and Northeast India Size: HBL: -93 cm Weight: 12.5-20.5kg Diet: Markhor, Muskdeer, Goral, Samber, Swamp deer, Pig, Gaur, Buffalo etc Activity time: Diumal, Noctumal Threats: Diseases, Loss of habitat, Decline in prey species, Poisoning and Poaching In trade: Skin IUCNWPA/CITES: Vulnerable/III/App. II

Ladakh Dhole

Local Name: Dhol, Son (Hindi); Ramkun (Kashmiri); Farra (Ladakhi) Family: Canidae Latin Name: Cuon alpinus laniger (Pallas) Distribution: Ladakh Dhole is sparsely but widely distributed in Ladakh region within Indian limits Size: HBL: ~93 cm Weight: 12. 5-20.5kg Diet: Birds, Small mammals, Large mammals and Cattles Activity time: Diurnal, Nocturnal Threats: Disease, Loss of habitat (especially in Kashmir), Decline in prey species, Poisoning and Poaching In trade: Skin IUCN/WPA/CITES: Critically Endangered/III/App. II





Indian Fox/Bengal Fox

Local Name: Lornii (Hindi), Lokeria (Central India), Kodisilai (Oriya), Sanna naree (Kannada), Kuru naree (Malayalam), Gunta-nakka (Telegu), Kulla naree (Tamil), Hiyal (Assamese), Lamhui (Manipuri), Kokri (Marathi), Khek-shiyal (Bengali) Family: Canidae Latin Name: Vulpes bengalensis Distribution: Throughout India, Mostly in the open areas near human habitation Size: TBL: -55 cm Weight: -2.5kg Diet: Fruits, Insects, Birds, Leafs, Small mammals, Carrion Activity time: Noctumal Threats: Habitat disturbance and Poaching. In trade: Skin IUCN/WPA/CITES: Lower risk/II/App. III

Common Red Fox

Local Name: Lomri (Hindi), Loh (Kashmin) Family: Canidae Latin Name: Vulpes vulpes montanna (Linnaeus) Distribution: Northern Himalayas from Ladakh to Kashmir and Sikkim Size: HBL: 52-72cm; Tail Length: ~40cm, Hind foot: ~14cm Weight: 3.5kg Diet: Rodents like Marmots, Voles, Squirrels and Mice/hares Activity time: Diumal, Noctumal Threats: Diseases, Loss of habitat, Poaching, Poisoning and Hybridization In trade: Skin BUCNWPAICITES: Lower Risk/WApp, III





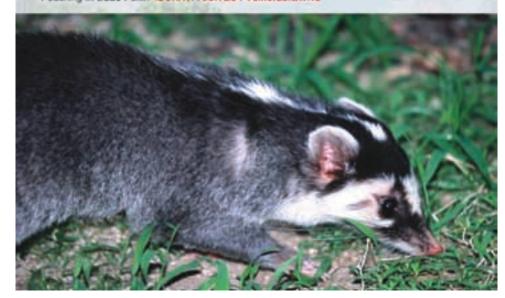


Jungle Cat

Local Name: Jungli billi (Hindi), Bon biral (Bengali), Baul (Marathi), Kaadu bekku (Kannada), Kattu ponai (Tamil), Bana bhua (Oriya) Family: Felidae Latin Name: Felis chaus Distribution: All over India, except high Himalayas upto 2400m Size: TBL: -70cm Weight: 4-6kg Diet: Small mammals and Birds Activity time: Noctumal, Diumal Threats: Poaching, Habitat loss and Road kills In trade: Skin, Skull, Bone, Meat IUCNWPAICITES: Lower risk/III/App, II

Large-toothed Ferret Badger

Local Name: Bajra (Hindi) Family: Musleiidae Latin Name: Melogale personata Distribution: Northeast India and North Bengal Size: TBL: -40 cm Weight: -3kg Diet: Birds, Small mammals and Fruits Activity time: Noctumal Threats: Habitat loss, Poaching In trade: Skin IUCNWPAICITES: Vulnerable/IUNC





Eurasian Otter/Common Otter

Local Name: Udbitao (Hindi), Neeru nai (Kannada), Neemai (Tamil/Malayalam), Shanamba (Manipuri), Nirukaka (Telegu) Family: Mustelidae Latin Name: Lutra Lutra Distribution: All along the basin of river Ganges and its tributaries. Mostly concentrated at Uttaranchal Size: TBL: 55-82cm Weight: -10kg Diet: Fish, Crustaceans, Amphibians, Small Mammals and Birds Activity time: Nocturnal, Crepuscular and Diumal Threats: Poaching, Habitat loss, Sitation and Pesticides In trade: Live Animal, Meat, Skin IUCNWPA/CITES: Lower risk /III/App. I

Smooth-Coated Otter/Smooth Indian Otter

Local Name: Udbilao (Hindi), Neeru nai (Kannada), Neernai (Tamil/Malayalam), Shanamba (Manipuri), Nirukaka (Telegu) Family: Mustelidae Latin Name: Lutrogale perspicilate Distribution: Spread all over India, Frequently seen at Uttar Pradesh, Kerala and West Bengal Size: TBL: -75cm Weight: -9kg Diet: Fish, Crustaceans, Amphibians, Small mammals and Birds Activity time: Nocturnal, Crepuscular and Diumal Threats: Poaching, Habitat Joss; Sitation and Pesticides In trade: Live Animal, Meat, Skin IUCN/WPA/CITES: Vulnerable/III/App. II









Yellow-Throated Marten

Local Name: Garan (Kashmin), Chitrola (Garhwali), Shungsam (Bhotia), Suchuyokai (Naga) Family: Mustelidae Latin Name: Martes flavigula Distribution: Himalayas and Northeast India Size: TBL: 45-67cm Weight: -3kg Diet: Small mammals, Birds, Reptiles and Fruits Activity time: Noctumal and Diurnal Threats: Poaching and Habitat loss In trade: Meat. Skin IUCN/WPA/CITES: Lower risk/III/App. III



Nilgiri Marten

Local Name: Illigan (Muthuvan) Family: Mustelidae Latin Name: Marles gwalkinsi Distribution: Nilgiri Hills Size: TBL: 58-67cm Weight: ~2.5kg Diet: Small mammals, Birds, Reptiles and Fruits Activity time: Noctumal and Diurnal Threats: Poaching and Habitat loss. In trade: Meat, Skin IUCN/WPA/CITES: Vulnerable/III/App. III









Beech Marten

Local Name: Chitrola (Garhwali) Family: Mustelidae Latin Name: Maries foina Distribution: Himalayas, Jammu & Kashmir and Ladakh (+2000m) Size: TBL: 30-46 cm Weight: -2 kg Diet: Small mammals, Birds, Reptiles and Fruits Activity time: Nocturnal, Diumal Threats: Poaching and Habitat loss In trade: Meat, Skin IUCN/WPA/CITES: Vulnerable/III/App. III

Pale or Mountain Weasel

Local Name: Chitrola (Garhwali), Tabo, Senai (Nishi) Family: Mustelidae Latin Name: Mustelia altaica Distribution: Upper Himalayas, Ladakh to Sikkim Size: TBL: 20-25cm Weight: ~300 gm Diet: Eggs, Small mammals, Birds and Reptiles Activity time: Nocturnal, Diumal Threats: Poaching and Habitat loss In trade: Meat, Skin IUCN/WPA/CITES: Yulinerable/WApp, III





Yellow-Bellied Weasel

Local Name: Chitrola (Garhwali), Tabo, Senai (Nishi) Family: Mustelidae Latin Name: Mustelia kathiah: (Hodgson) Distribution: Ever green forests of Himalayas and Northeast India Size: TBL: 20-26cm Weight: -300gm Diet: Small mammals, Birds and Reptiles Activity time: Noctumal, Diurnal Threats: Poaching and Habitat loss In trade: Meat, Skin: IUCN/WPA/CITES: Vulnerable/III/App, III.

Himalayan Weasel

Local Name: Chitrola (Garhwall), Tabo, Senai (Nishi) Family: Mustelidae Latin Name: Mustela sibirica Distribution: Upper Himalayas; Jammu & Kashmir to the Northeast Size: TBL: -32cm Weight: -600gm Diet: Eggs, Small mammals, Birds and Reptiles Activity time: Nocturnal, Diumal Threats: Poaching and Habitat loss. In trade: Meat, Skin: IUCN/WPA/CITES: Vulnerable/III/App. III









Black-striped Weasel

Local Name: Chitrola (Garhwali), Tabo, Senai (Nishi) Family: Mustelidae Latin Name: Mustela strigidorsa (Grey) Distribution: North Bengal, Sikkim, Assam, Arunachal and Nagaland Size: TBL: -28cm Weight: -450gm Diet: Small mammals, Birds and Reptiles Activity time: Nocturnal, Diumal Threats: Poaching and Habitat loss. In trade: Meat. Skin IUCNWPA/CITES: Vulnerable/IlinC

Tibetian Polecat

Local Name: Family: Mustelidae Latin Name: Mustele putorius Distribution: Jammu & Kashmir, Siikkim (range extent upto Tibetian plateaue) Size: TBL: ~38cm Weight: ~720gm Diet: Small mammals, Birds, Eggs and Reptiles Activity time: Noctuma, Diumal Threats: Poaching and Habitat loss In trade: Meat, Skin IUCN/WPA/CITES: Volnerable/II/NC





Small Indian Civet

Local Name: Kosturi (HIndi), Gondho gokul, Bham (Bengali), Ud manjar (Marathi), Punagu poonay (Tamil), Meru, Poo veruke (Malayalam), Punagina bekku (Kannada), Salia patini (Oriya) Family: Viverridae Latin Name: Viverricula indica Distribution: Throughout India except Jammu & Kashmir, Deserts and high Himalayas Size: TBL: -60cm Weight: -3kg Diet: Small mammals, Birds, Fruits, Eggs and Insects Activity time: Nocturnal Threats: Poaching, Habitat loss and Road kills. In trade: Meat, Skin, Scent Gland. IUCNWPAICITES: Vulnerable/III/App, III.

Large Indian Civet

Local Name: Khattas (Hindi), Bado gokul, Bham (Bengali), Bhran (Nepalese), Kung (Bhotia), Moirang sathibi (Manipuri) Family: Viverridae Latin Name: Viverra zibetha Distribution: Himachal Pradesh, Northeast India, Orissa, West Bengal and Bihar Size: TBL: ~90cm Weight: ~9kg Diet: Small mammals, Birds, Fruits, Eggs and Insects Activity time: Noctumal Threats: Poaching and Habitat loss. In trade: Meat, Skin, Scent Gland IUCNIWPA/CITES: Vuinerable/III/App, III







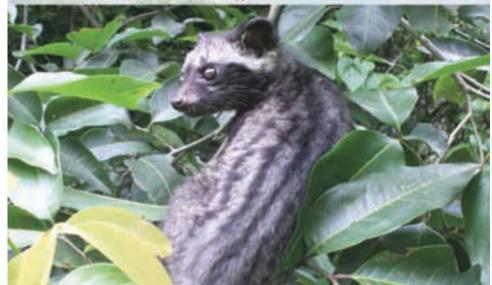


Brown Palm Civet

Local Name: Marappatti (Malayalam) Family: Viverridae Latin Name: Paradoxurus jerdoni Distribution: Kerala and Tamilnadu Size: TBL: -55cm Weight: -3.5kg Diet: Small mammals, Birds, Fruits, Eggs and Insects Activity time: Nocturnal Threats: Poaching, Habitat loss In trade: Meat, Skin, Scent Gland IUCNWPA/CITES: Vulnerable/III/App. III

Common Palm Civet

Local Name: Khatas (Hindi), Bham (Bengali), Tapkiri ud manjar (Marathi), Maranai (Tamil), Marappatti (Malayalam), Marabekku (Kannada), Dali odha (Oriya), Kehe (naga), Moirang sathibi (Manipuri) Family: Viverridae Latin Name: Paradoxurus hermaphroditus Distribution: Throughout India except Gujrat, Rajasthan and Himalayan belt Size: TBL: 40-67cm Weight: -4kg Diet: Small mammals, Birds, Fruits, Eggs and Insects Activity time: Noctumal Threats: Poaching and Habitat loss In trade: Meat, Skin, Scent Gland IUCNWPAICITES: Lower risk/III/App. III





Jerdon's Palm Civet

Local Name: Kanthakeeri (Malayalam) Family: Viverridae Latin Name: Paradoxurus jerdoni (Blanford) Distribution: Kerala, Tamilnadu and Kamataka Size: HBL: ~55cm; Tail length: 42-55cm Weight: ~3kg Diet: Small birds, Mammals and Insects Activity time: Noctumal Threats: Habitat fragmentation, Loss of habitat, Poaching and Traping In Trade: Meat, Skin, Scent Gland IUCN/WPA/CITES: Vulnerable/III/App.III

Small Toothed Palm Civet

Local Name: Three stripped palm civet, Three banded palm civet (English)

Family: Viverridae

Latin Name: Arctogalidia trivirgata milisi

(Wroughton)

Distribution: West Bengal to Assam and

Arunachal Pradesh in Northeast India

Size: HBL: 50-59cm; Tail length: ~53.5cm Weight: ~2.5kg

Diet : Small mammals, Birds, Insects,

Lizards, Frogs

Activity time: Nocturnal

Threats: Human interference, Loss of

habitat and Poaching

In Trade: Meat, Skin, Scent Gland IUCN/WPA/CITES: Vulnerable/IUNC







Himalayan Masked Palm Civet

Local Name: Masked Palm Civet, Kashmir Masked Palm Civet (English), Biju (Hindi) Family: Viverridae Latin Name: Paguma larvata (Hamilton-Smith) Distribution: Through the Himalayas from Kashmir to Arunachal Pradesh through Punjab, Himachal Pradesh, Uttar Pradesh, West Bengal, Sikkim and Assam within India Size: HBL: 43-75cm; Tail length: 40-57cm; Hindfoot: ~99.0cm; Ear: ~5cm Weight: ~2.5kg Diet: Birds including poutry and Small mammals Activity time: Noctumal Threats: Interspecific competition, Habitat fragmentation, Human interference, Loss of habitat, Trade, Hunting, Poaching In Trade: Meat, Skin, Scent Gland IUCN/WPA/CITES: Lower Risk/WApp.III

Himalayan Palm Civet

Local Name: Bichu (Garhwali) Familly: Viverridae Latin Name: Paguma larvata Distribution: Kashmir; Assam, entire Himalays including Northeast India (+400m) and Andamans Size: TBL: -58cm Weight: -3.5kg Diet: Small mammals, Birds, Fruits, Eggs and Insects Activity time: Nocturnal Threats: Poaching and Habitat loss In trade: Meat, Skin, Scent Gland, JUCNWPAICITES: Lower risk/III/App, III





Stripe-Necked Mongoose

Local Name: Newala (Hindi), Norio (Gujarati), Keeree (Tamil/Kannada/Malayalam), Yentawa mangisa (Telegu), Beji (Bengali), Mungoos (Marathi), Nool (Kashmiri), Neula (Oriya) Family: Herpestidae Latin Name: Herpestes vitticollis Distribution: Western Ghats Size: TBL: 42-57 cm Weight: ~3 kg Diet: Small mammals, Birds, Reptiles, Fruits and Insects Activity time: Diurnal, Nocturnal and Crepuscular Threats: Habitat loss and Poaching In trade: Meat, Skin, Hair IUCNWPA/CITES: Lower risk/III/App, III

Grey Mongoose

Local Name: Newala (Hindi). Norio (Gujarati), Keeree (Tamil/Kannada/Malayalam), Yentawa mangisa (Telegu), Beji (Bengali), Mungoos (Marathi), Nool (Kashmin), Neula (Oriya) Family: Herpestdae Latin Name: Herpestdae edwardsii Distribution: All over India, except high Himalayas. Size: TBL: 33-43cm Weight: ~1kg Diet: Small mammals, Birds, Reptiles, Fruits and Insects Activity time: Diurnal, Noctumal and Crepuscular Threats: Habitat loss and Poaching. In trade: Meat, Skin, Hair (Artist/Painting Brush) IUCN/WPA/CITES: Vulnerable/III/App. III









Small Indian Mongoose

Local Name: Newala (Hindi), Norio (Gujarati), Keeree (Tamili/Kannada/Malayalam), Yentawa mangisa (Telegu), Beji (Bengali), Mungoos (Marathi), Nool (Kashmiri), Neula (Oriya) Familty: Herpestidae Latin Name: Herpestes javanicus Distribution: All over India, except high Himalayas, concentrated in Kolkata Size: TBL: 37-52 cm Height: ~825gm Diet: Small mammals, Birds, Reptiles, Fruits and Insects Activity time: Diurnal, Noctumal and Crepuscular Threats: Habitat loss and Poaching In trade: Meat, Skin, Hair RUCN/WPA/CITES: Lower risk/III/App, III

Ruddy Mongoose

Local Name: Newala (Hindi), Norio (Gujarati), Keeree (Tamil/Kannada/Malayalam), Yentawa mangisa (Telegu), Beji (Bengali), Mungoos (Marathi), Nool (Kashmiri), Neula (Oriya) Family: Herpestidae Latin Name: Herpestes smithi Distribution: Central India. Size: TBL: 40-48 cm Weight: -1 kg Diet: Small mammals, Birds, Reptiles, Fruits and Insects Activity time: Diumal, Noctumal and Crepuscular Threats: Habitat loss and Poaching In trade: Meat. Skin, Hair IUCN/WPA/CITES: Vulnerable/MApp, III





Brown Mongoose

Local Name: Newala (Hindi), Norio (Gujarati), Keeree (Tamil/Kannada/Malayalam), Yentawa mangisa (Telegu), Beji (Bengali), Mungoos (Marathi), Nool (Kashmiri), Neula (Oriya) Family: Herpestdae Latin Name: Herpestes brachyurus Distribution: Western Ghats Size: TBL: 40-52 cm Welght: ~2 kg Diet: Small mammals, Birds, Reptiles, Fruits and Insects Activity time: Diumal, Noctumal and Crepuscular Threats: Habitat loss and Poaching In trade: Meat. Skin, Hair (Painting/Artist Brush)

IUCN/WPA/CITES: Lower risk/II/App. III

Crab-Eating Mongoose

Local Name: Newala (Hindi), Norio (Gujarati), Keeree (Tamil/Kannada/Malayalam), Yentawa mangisa (Telegu), Beji (Bengali), Mungoos (Marathi), Nool (Kashmiri), Neula (Oriya) Family: Herpestidae Latin Name: Herpestes urva Distribution: West Bengal, Assam, Arunachal Pradesh and Tripura Size: TBL: ~47 cm Weight: ~2 kg Diet: Small mammals, Birds, Reptiles: Fruits and Insects Activity time: Diurnal, Nocturnal and Crepuscular Threats: Habitat loss and Poaching In trade: Meat. Skin, Hair

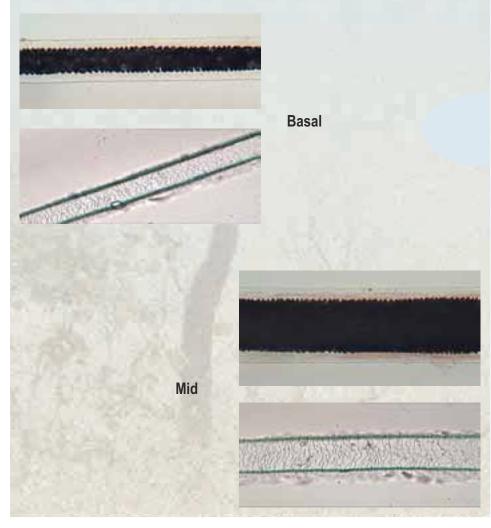






Hair signature pattern of Herpestes spp.(Mongoose)

- Color- White Brown and black patches
- Cuticular Scale Pattern-Imbricate
- Medulla-Continuous Medulla
- Medullary Index-0.61
- Source-WCCB (NR), Delhi





Tip



Identification of dorsal guard hairs of five Indian species of Mongoose,

Herpestes Illeger (Mammalia: Carnivora)
Herpestes Illeger (Mammalia: Carnivora)
By J.k.D. P. De Lakraborty and Charrab Apkraborty
Zoological Survey: Tructian New Aliporey. Mos Rocka, Rocka, Rocka, 700053, India

S.No	Species	Colour	Cuticular pattern	Medulla	Medullary Index
1.	Herpestes edwardsi	Clove brown & cream buff banded, Tip: Clove brown	Irregular Wave	Unbroken with cortical intrusion	.8183
2.	Herpestes javanicus	Clove brown & buff banded, Tip: Clove brown	Flattened irregular mosaic	Unbroken with cortical intrusion	.8890
3.	Herpestes smithi	Cream & Clove brown banded. Tip dark.	Irregular wave	Unbroken cellular	.662
4.	Herpestes palustris	Prout's brown & ochraceous buff banded. Tip: Prout's brown.	Irregular wave	Narrow aeriform lattice	.7576
5.	Herpestes urva	Pale cinnamon & Dusty iron gray banded. Tip: pale cinnamon	Irregular wave	Unbroken vacuolated	.4952





Wolly Hare

Local Name: Kharghosh (Hindi/Bengali), Ran sassa (Marathi), Molla (Kannada), Moyal (Malayalam), Saslu (Gujarati), Thekua (Oriya), Musal (Tamil), Choura pilli (Telegu), Soha pohu (Assamese) Family: Leporidae Latin Name: Lepus oiostolus Distribution: Jammu & Kashmir, Ladakh, Sikkim Size: TBL: 45cm Weight: -3 kg Diet: Grass and Leaf Activity time: Diumai Threats: Habitat loss and Poaching In trade: Meat, Skin, Hair IUCN/WPA/CITES: Lower risk/IUNC

Madras Hedgehog

Local Name: Mulleli (Malayalam) Family: Erinaceidae Latin Name: Hemiechinus nud/ventris Distribution: Tamil nadu and Kerala Size: HBL: 16-25 cm Weight: 270-420 gm Diet: Insects, Reptiles, Small mammals, Eggs, Fruits and Roots Activity time: Nocturnal Threats: Habitat loss and Poaching In Trade: Live Animal, Meat, Skin IUCN/WPA/CITES: Vulnerable/IV/NC.





Cape Hare

Local Name: Kharghosh (Hindi/Bengali), Ran sassa (Marathi), Molla (Kannada), Moyal (Malayalam), Saslu (Gujarati), Thekua (Oriya), Musal (Tamil), Choura pilli (Telegu), Soha pohu (Assamese) Family: Leporidae Latin Name: Lepus capensis Distribution: Open rocky areas and desert of Jammu & Kashmir Size: TBL: ~45cm Weight: ~2.5 kg Diet: Grass and Vegetation Activity time: Diurnal Threats: Habitat loss and Poaching In Trade: Meat, Skin, Hair IUCN/WPA/CITES: Lower risk/III/NC

Indian Hare

Local Name: Kharghosh (Hindi/Bengali), Ran sassa (Marathi), Molta (Kannada), Moyal (Malayalam), Sastu (Gujarati), Thekua (Oriya), Musal (Tamit), Choura pilli (Telegu), Soha pohu (Assamese) Family: Leporidae Latin Name: Lepus nigricollis Distribution: All over India excepts high Himalayas and Mangroves Size: TBL: ~45cm Weight: ~2.5 kg Diet: Grass and Leafs Activity time: Diumal Threats: Habitat loss and Poeching In trade: Meat, Skin, Hair IUCN/WPA/CITES: Vulnerable/IUNC







Indian Porcupine

Local Name: Sayal, Sahi (Hindi), Sheval (Marathi), Yedu pandi (Telegu), Mullan panni (Malayalam/Tamil), Shojaru (Bengali), Khar-pusht (Kashmiri), Mullu handi (Kannada), Jhinka (Oriya) Family: Hystricidae Latin Name: Hystrix indica Distribution: All over India except high Himalayas and Mangroves Size: HBL: 62-92 cm Weight: 13-20 kg Diet: Grain, Fruits and Roots Activity time: Noctumal Threats: Poaching In Trade: Meat, Spine IUCN/WPA/CITES: Lower risk/IV/INC

Himalayan Crestless Porcupine

Local Name: Ketela pohu (Assamese), Sakhu (Mizo), Suku (Naga) Family: Hystricidae
Latin Name: Hystrix brachyura Distribution: Eastern Himalayas, close to cultivation
land Size: HBL: 47-77 cm Weight: -9 kg Diet: Grain, Fruits and Roots Activity time
: Noctureal Threats: Poaching and Habitat loss In Trade: Meat, Spine
IUCN/WPAICITES: Vulnerable/IIINC





Eastern Himalayan Marmot

Local Name: Brin (Kashmin), Chibi (Sikkimise) Family: Sciuridae Latin Name: Marmota himalayan (Hodgson) Distribution: Himalayas from Ladakh and Kashmir to Sikkim in India Size: HBL: 355-595mm; Tail length: 115-205mm; Hindfoot length: 75-105mm; Weight: Not known Diet: Roots, Leaves, Grasses and various plant Seeds Activity time: Nocturnal Threats: Human interference, Interspecific competation, Habitat fragmentation, Loss of habitat, Trade, Hunting, Predation In Trade: Live Animals, Fur, Meat and Body Parts

IUCN/WPA/CITES: Endangered/II/App.III

All over the world there is a confusion about this creatures. As they have typical body shape to get adapted to the aquatic life similar with that of fish they are often considered as fish. If you consider the local names then you will find it very similar with the local name of fishes. But they are mammals, they directly give birth to the babies after a certain gestation time and feeds them with milk from the female mammary glands like all other mammals. Some of them are solitary living whereas some are very social. Their adaptibility with the aquatic system is very interesting as they respire through lung like other mammals by a unique system. Due to this power of adaptation they are distributed in all the oceans seas and bays.

Within the Indian limit there leaves varied species of such mammals which are discussed below.





Malayan Giant Squirrel

Local Name: Ram kota (Bengali) Family: Sciuridae Latin Name: Ratufa bicolor gigantea Distribution: Northeast India and Sikkim Size: HBL: 37-60 cm; tail: 60 cm Diet: Grains, Fruits and Leafs Activity time: Diumal Threats: Habitat loss In Trade: Meat, Trophy IUCN/WPA/CITES: Endangered/IV/App, II



Indian Giant Squirrel/ Large Indian Giant Squirrel

Local Name: Karat, Rasu (Hindi), Shekra (Marathi), Anii (Tamil), Malayannan (Malayalam), Keshalilu (Kannada)

Family : Sciuridae

Latin Name: Ratula indica dealbata

(Blandford)

Distribution: Western Ghats, Kerala, Central

India

Size: HBL: 37-53 cm; tail: 60 cm Diet: Grains, Fruits and Leafs

Activity time: Diumai

Threats: Poaching and Habitat loss In Trade: Skin, Meat, Zoo, Trophy IUCNWPAIGITES: Vulnerable/IIIApp. II

Collared Hedgehog

Local Name: Sharo (Gujarati) Family: Erinaceidae

Latin Name: Hemiechinus collaris Distribution: Rajasthan, Gujarat (Kutch), up to Agra in Uttar Pradesh. Pocket population around Pune

(up to 1,000 m) Size : TBL: -16 cm Weight : ~450 gm

Diet: Insects, Reptiles, Small mammals and Eggs

Activity time : Noctumal

Threats: Habitat loss and Poaching In Trade: Live Animal, Meat, Skin IUCN/WPA/CITES: Lower risk/IV/NC



Indian Hedgehog

Local Name: Sharo (Gujarati), Kooram (Kannada) Family: Erinaceidae Latin Name: Hemiechinus micropus Distribution: Gujarat (Kutch), Rajasthan, Andhra Pradesh, Kamataka, Tamil Nadu and Kerala Size: TBL: 16-25 cm Weight: -350 gm Diet: Insects, Reptiles, Small mammals, Eggs, Fruits and Roots Activity time: Diurnal Threats: Habitat loss and Poaching In Trade: Live Animal, Meat, Skin

IUCN/WPA/CITES: Lower risk/IV/NC







Orange-Bellied Himalayan Squirrel

Local Name: Kerketua (Assamese), Kath beral,

Kotha (Bengali) Family: Sciuridae

Latin Name: Dremomys lokriah

Distribution: Foothills of Himalayas in Sikkim and Northeast

Size : 8L: 20 cm; tail: 22 cm Diet : Nuts and Fruits Activity time : Diumal

Threats: Habitat loss and Poaching

In Trade: Meat, Skin, Hair

IUCN/WPA/CITES: Endangered/IV/NC



Hoary-bellied Himalayan Squirrel

Local Name: Kerketua (Assamese), Kath beral, Kotha (Bengali) Family: Sciuridae Latin Name: Callosciurus pygerythrus Distribution: Sikkim, North Bengal and North east Size: HBL: 20-25cm; tail: 17-19 cm Weight: -9 kg Diet: Nuts and Fruits Activity time: Diurnal Threats: Poaching and Habitat loss in Trade: Meat, Skin, Hair

IUCN/WPA/CITES: Vulnerable/IV/NC





Asian Brush-tailed Porcupine

Local Name: Ketela pohu (Assamese), Shojaru (Bengali) Family: Hystricidae Latin Name: Atherurus macrourus Distribution: Hilly areas of Northeast India Size: HBL: 34-55 cm Weight: 2-4.5 kg Diet: Grains, Fruits and Roots Activity time: Noctumal Threats: Habitat loss In Trade: Meat, Spine: IUCN/WPA/CITES: Endangered/IV/NC

Pallas's Squirrel

Local Name: Kerketua (Assamese).

Kath beral, Kotha (Bengali) Family: Sciuridae

Latin Name : Callosciurus erythraeus Distribution : Sikkim and Noertheast India

Size: HBL: 18-24 cm; tail: ~20 cm

Weight: 2-4.5 kg Diet: Nuts and Fruits Activity time: Diurnal

Threats: Habitat loss and Poaching

In Trade : Skin, Meat

IUCN/WPA/CITES : Endangered/IV/NC







Woolly Flying Squirrel
Local Name: Kerketua (Assamese), Kath beral, Kotha (Bengali) Family : Sciuridae Latin Name: Eupetaurus cinereus Distribution : Northern part of Jammu & Kashmir and Sikkim Size: HBL: 50-60 cm; tail: 40-50 cm. Diet: Vegetation, Nuts and Fruits Activity time: Diurnal Threats: Habitat loss and Poaching In Trade: Skin, Meat.

IUCNWPAICITES: Endangered/III/NC

Kashmir Flying Squirrel / Larger Kashmir Flying Squirrel

Local Name: Kerketua (Assamese), Kath beral, Kotha (Bengali) Family : Sciuridae Latin Name: Hylopetes baberi (Blyth) Distribution: Jammu & Kashmir, Himachal Pradesh and Sikkim Size: HBL: 25-32cm; tail: 27-37cm Diet: Seeds, Vegetation, Nuts and Fruits Activity time: Noctumal Threats: Habitat loss and Human interference In Trade: Skin, Fur and Meat IUCN/WPAICITES: Vulnerable/II/NC





Three-Striped Palm Squirrel

Local Name: Kath beral (Bengali), Gileheri (Hindi), Khadi khar (Marathi), Annarakannan (Malayalam), Anna pilli (Tamil) Family: Sciuridae Latin Name: Funambulus palmarum Distribution: Central India, Kamataka, Tamilnadu and Kerala Size: HBL: 13-16 cm; tail: 15-17 cm Diet: Seeds, Leafs, Insects, Nuts and Flowers Activity time: Diurnal Threats: Habitat loss and Poaching In Trade: Meat, Skin, Trophy, Hair

IUCN/WPA/CITES: Endangered/IV/NC

Five-Striped Palm Squirrel

Local Name: Kath beral (Bengali), Gileheri (Hindi), Khadi khar (Marathi), Annarakannan (Malayalam), Anna pilli (Tamil) Familly: Sciuridae Latin Name: Funambulus pennantii Distribution: All over northern India upto Meghalaya Size: HBL: 14-17 cm; tail: 15-17 cm Diet: Seeds, Vegetation, Insects, Nuts and Flowers Activity time: Diurnal Threats: Poaching and Habitat loss In Trade: Meat, Skin, Hair, Trophy IUCN/WPA/CITES: Vulnerable/IV/IVC









Gray's Giant Flying Squirrel

Local Name: Not available Family: Sciuridae Latin Name: Petaurista nobilis (Gray)
Distribution: In India: Darjeeting Dist., West Bengal and Sikkim Size: HBL: 350425mm; Tail length: 380-515mm; Hindfoot length: ~75mm; ear: ~43mm; Weight: Not known Diet: Seeds, Vegetation, Nuts and Fruits Activity time: Noctumal Threats: Catastrophic events, Interspecific competetion, Habitat fragmentation, Loss of habitat In Trade: Live Animal, Fur and Meat IUCNWPA/CITES: Lower Risk/IUNC

Small Kashmir Flying Squirrel

Local Name: Not available

Family: Sciuridae

Latin Name: Hylopetes fimbriatus (Gray)

Distribution: Jammu and Kashmir, Himachal Pradesh and Ultar Pradesh

Size: HBL: 240-300mm; Tail length: 235-285mm; Hind foot length: ~57mm; Weight: Not known

Diet : Seeds, Vegetation,

Nuts and Fruits

Activity time: Nocturnal Threats: Catastrophic events, Interspecific competition, Habital fragmentation, Loss of habital

In Trade: Skin, Fur and Meat JUCN/WPA/GITES: Lower Risk/IUNC



Indian Giant Flying Squirrel/ Large Brown Flying Squirrel

Local Name: Kerketua (Assamese), Kath beral, Kotha (Bengali)

Family: Sciuridae

Latin Name: Petaurista philippensis Distribution: Maharashtra, Rajasthan, Orissa, West Bengal, Andhra Pradesh, Kamataka, Tamiln adu and Kerala Size: HBL: 32-47 cm; tail: 32-58 cm

Diet: Leafs, Nuts and Fruits Activity time: Diurnal Threats: Habital loss In Trade: Meat, Skin

IUCN/WPA/CITES: Vulnerable/II/NC



Namdhapa flying squirrel

Local Name: Not available Family: Sciuridae Latin Name: Biswamoypteras biswasi Saha Distribution: Namdhapha Biosphere Resere, Tirap Dist., Arunachal Pradesh Size: HBL: -400mm, Tall length: -600mm, Hindfoot length: -75mm; ear: -45mm; Weight: Not known Diet: Seeds, Vegetation, Nuts and Fruits Activity time: Noctumal Threats: Catastrophic events, Interspecific competetion, Habitat fragmentation, Loss of habitat etc. In Trade: Meat, Skin, Pet IUCN/WPA/CITES: Critically Endangered/ItiNC







Giant Red Flying Squirrel

Local Name: Not Known Family: Sciuridae

Latin Name: Petaurista petaurista (Pallas) Distribution: Himalayan foothills from Jammu and Kashmir to Nagaland through Himachal Pradesh, Uttar Pradesh (Kumaon), Sikkim and Meghalaya

(Cherrapunji) in India Size: HBL: 325-475mm; Tail length: 370-400mm;

Hind foot length: ~67mm; ear: 45mm;

Weight: Not known

Diet: Seeds, Vegetation, Nuts and Fruits

Activity time: Noctumal

Threats: Catastrophic events, Interspecific competetion,

Habitat fragmentation, Loss of habitat In Trade: Live Animal, Fur, Meat. IUCN/WPA/CITES: Not evaluated/III/NC

Hodgson's Giant Flying Squirrel

Local Name: Lokharkee (Nepalese) Family : Sciuridae

Latin Name : Petaunista magnificus (Hodgson) Distribution: Darjeeling Dist., West Bengal

Size: HBL: 360-490mm; Tail length: 420-525mm;

Hindfoot length: 75-87mm; ear: -45mm;

Weight: -1.5kg

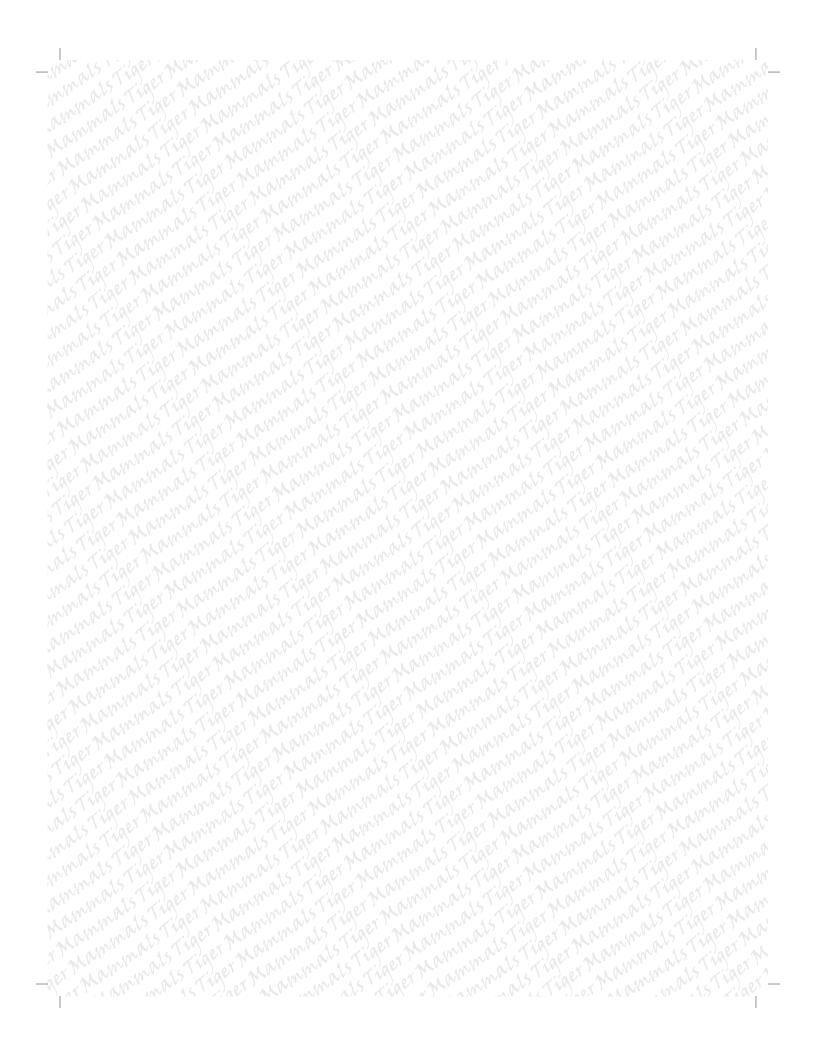
Diet: Seeds Vegetation, Nuts and Fruits

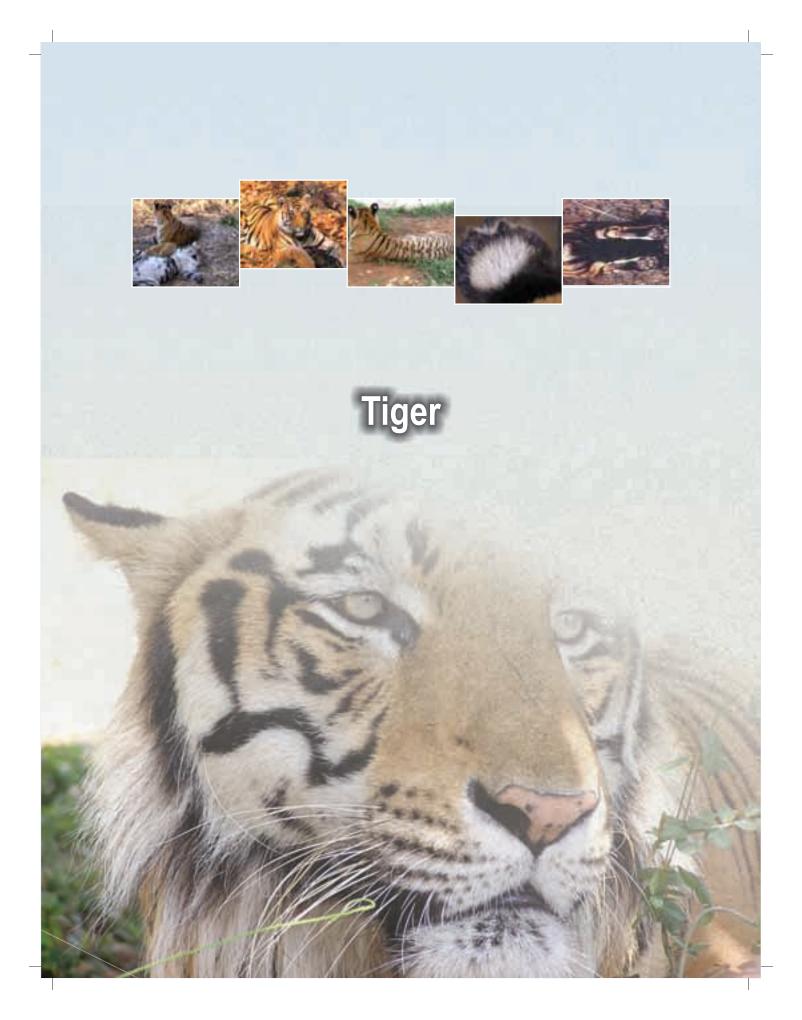
Activity time: Noctumal Threats: Catastrophic events. Interspecific competation,

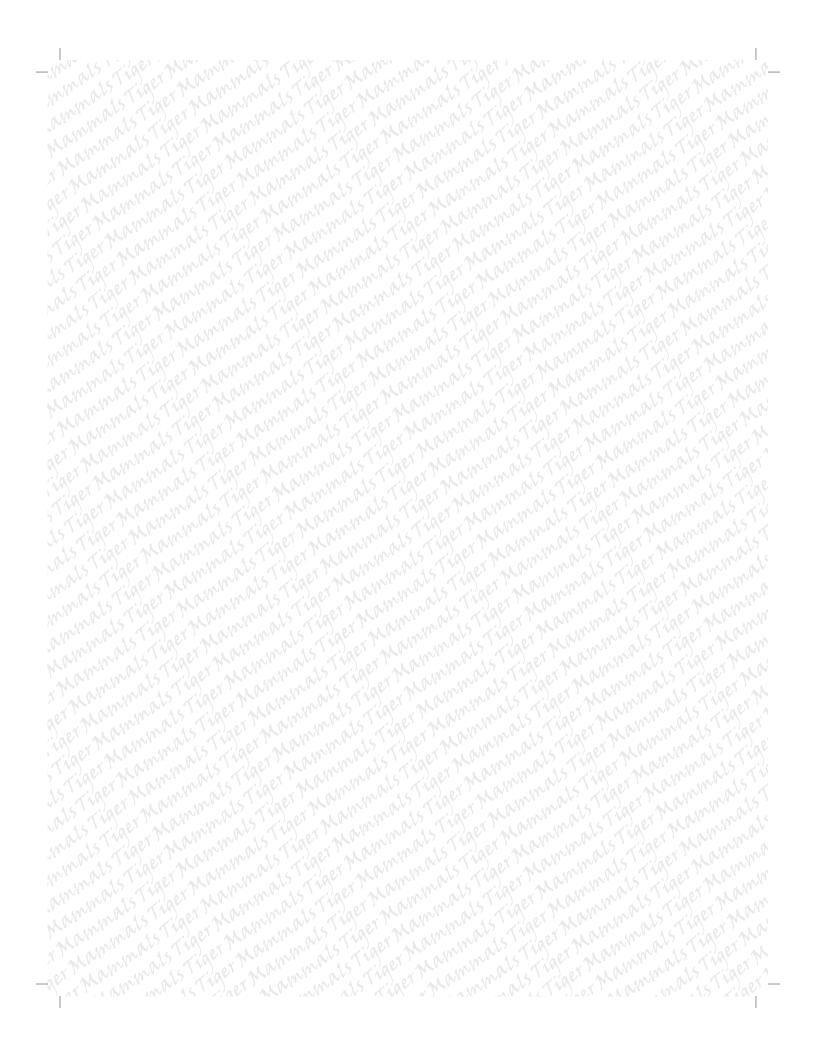
Habitat Fragmentation, Loss of habitat In Trade: Live Animal, Fur and Meat IUCN/WPA/CITES: Not evaluated/III/NC











Introduction

Fakes and counterfeits are the most dreaded things in the commercial world. They eat into the legitimate market share of the genuine businessmen, and divest the consumers of their hard earned money. The law expects the enforcement authorities to protect the interests of the businessmen and the consumers by taking action against the unscrupulous persons introducing fakes and counterfeits in the market. With a multi-billion dollar wildlife trade in the world, it is not surprising to find fakes of wildlife items in large quantities in the market. But the concerns of the enforcement authorities in this case are more for protecting the wildlife species in question than for safeguarding the interests of the traders and the consumers. Reckless trade has since long been identified as a great threat to the survival of wild fauna and flora. A large number of countries including India have enacted legislation that discourages both sale and purchase of wildlife items. Fakes are objectionable because they keep the demand for wildlife items alive. Fakes are dangerous because they can mislead the investigators and provide a cover to the clandestine wildlife trade.





Check for the presence of white Colour of the upper lip below and adjacent to the nasal openings



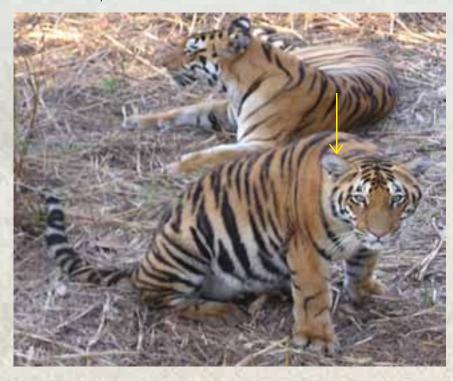
Check for the presence of Ocular Sun Spot



Check for presence of white colour on the maxillary cheeks

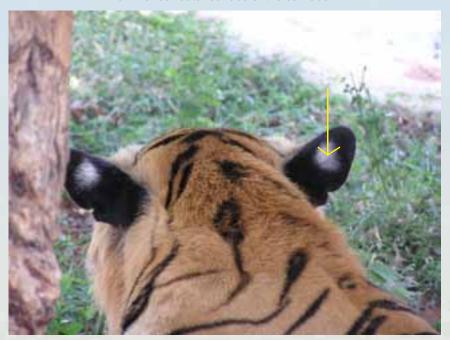


Check for presence of white hair on the front inner surface of ear lobe





Check for presence of black colour with white eyespot on the rear outer surface of the ear lobe.



Check for white colour on the portion below the mandible, chest and inner portions of fore legs



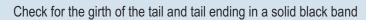
Check for neck stripes originating from the middle portion of the head and going out to front legs in an angular fashion



Check for white colour on the portions corresponding to the entire belly, insides of rear legs

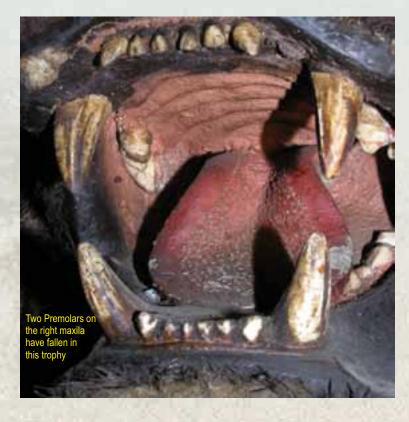


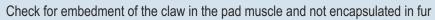






Check for Dentition in the order 2{I3.C1.P3.M1/ I3.C1.P2.M1} =30





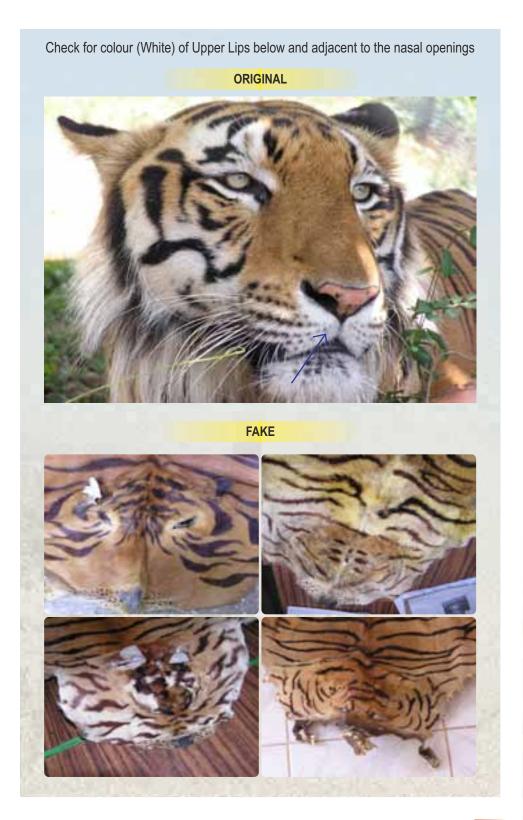


Check for presence of claws, 5 main and 1 dew on the fore paws and 4 main with dew claw absent on the hind paws





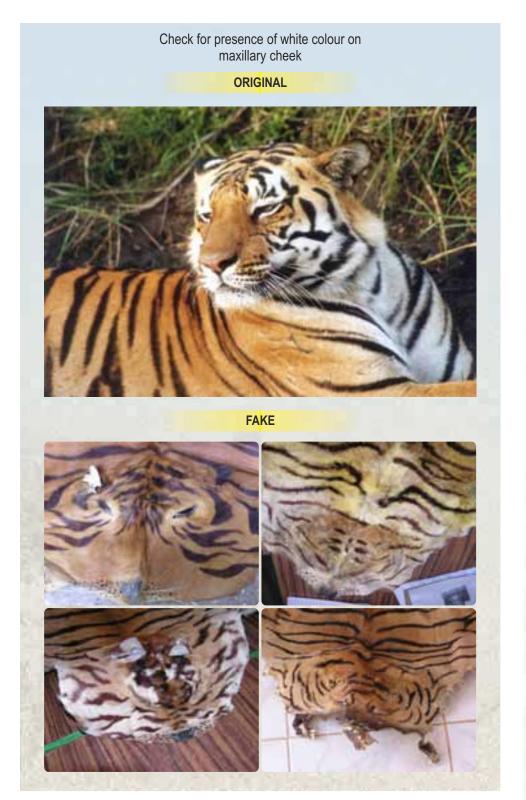
Check for black stripe overlapped by brown and not converse Recap of Identification of Salient Features







Check for presence of ocular sunspot ORIGINAL FAKE





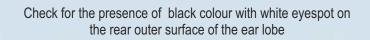
Check for the presence of white hair on the front inner surface of the ear lobe

ORIGINAL



FAKE





ORIGINAL





FAKE







Check for neck stripe originating from the middle portion of the head and going out to front leg in an angular fashion

ORIGINAL



FAKE



Check for the white colour on the portion corresponding to the entire belly, inside of rear leg ORIGINAL

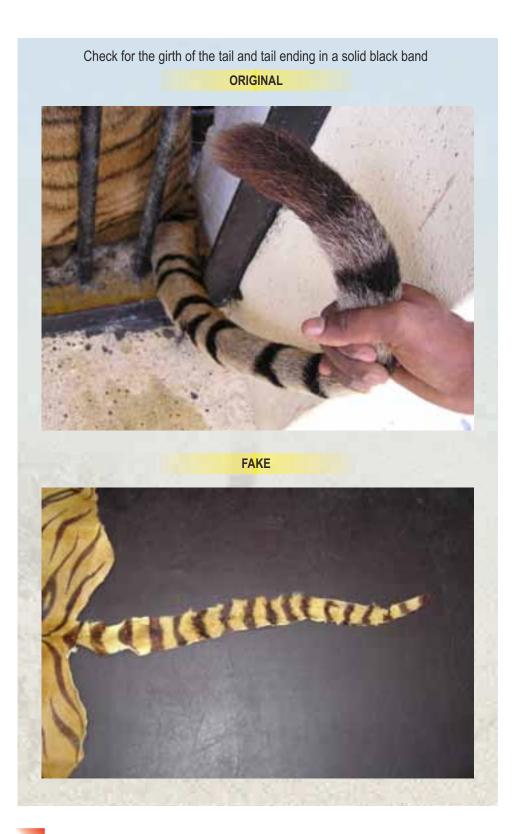


FAKE

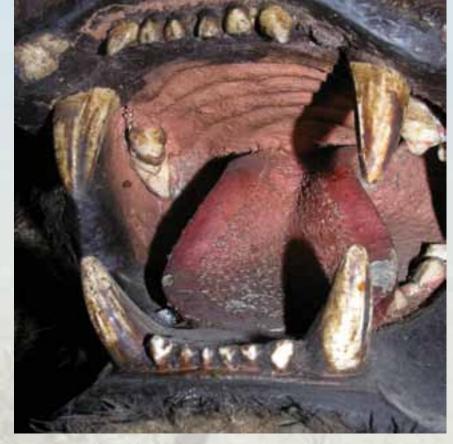








Check for Dentition in the order 2{I3.C1.P3.M1/ I3.C1.P2.M1} =30 ORIGINAL



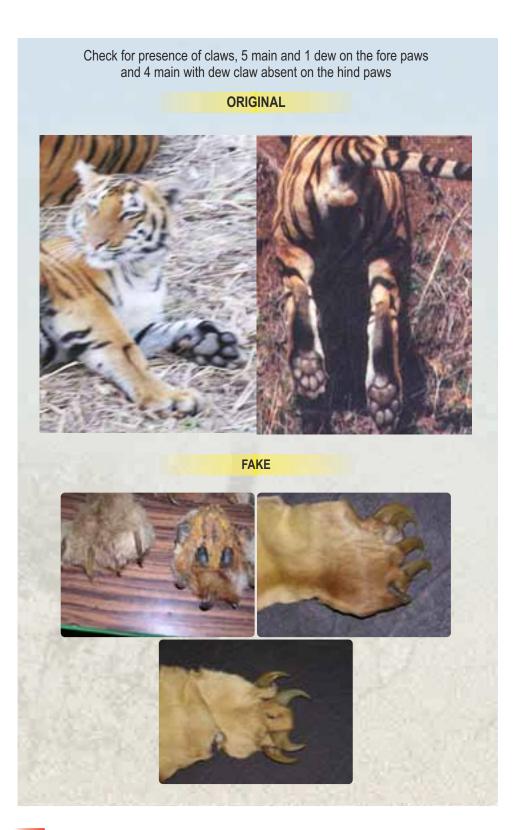










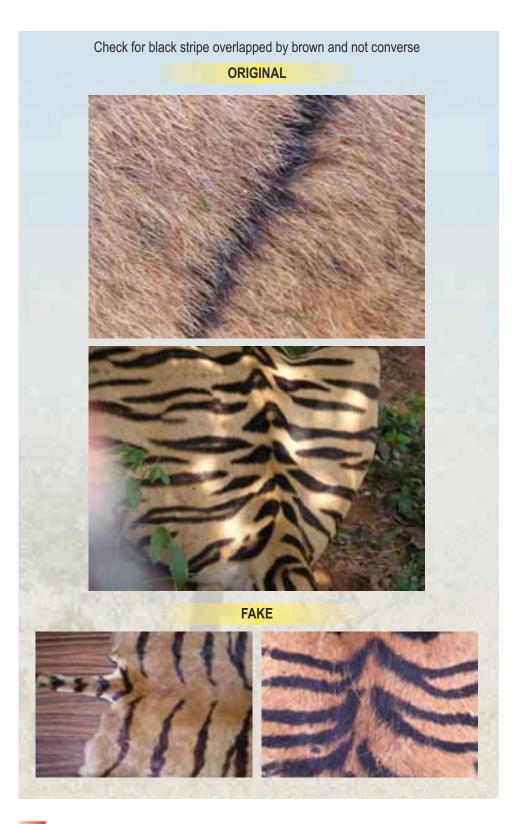


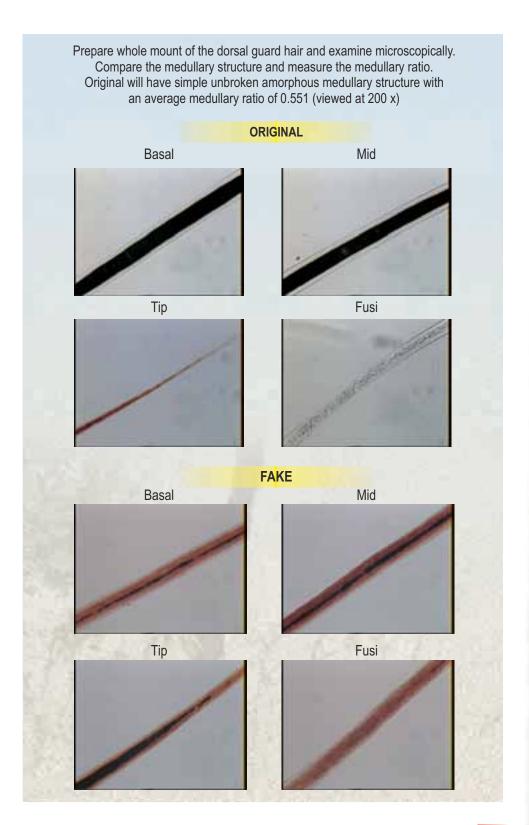
Check for embedment of the claw in the pad muscle and not encapsulated in fur ORIGINAL



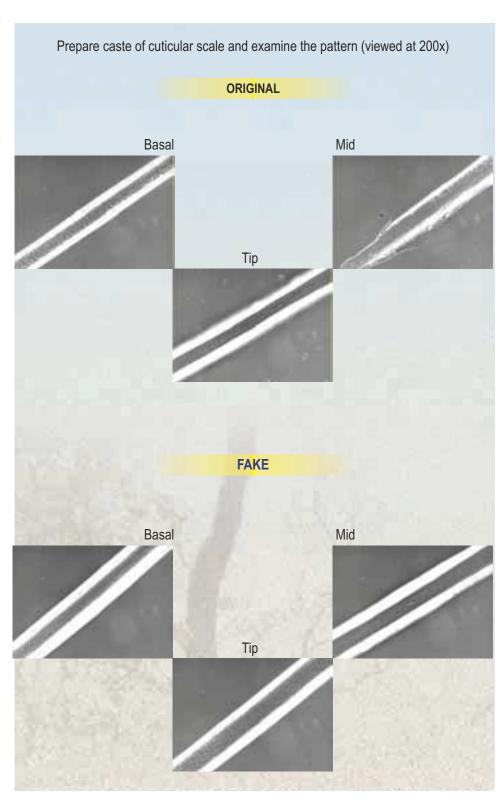


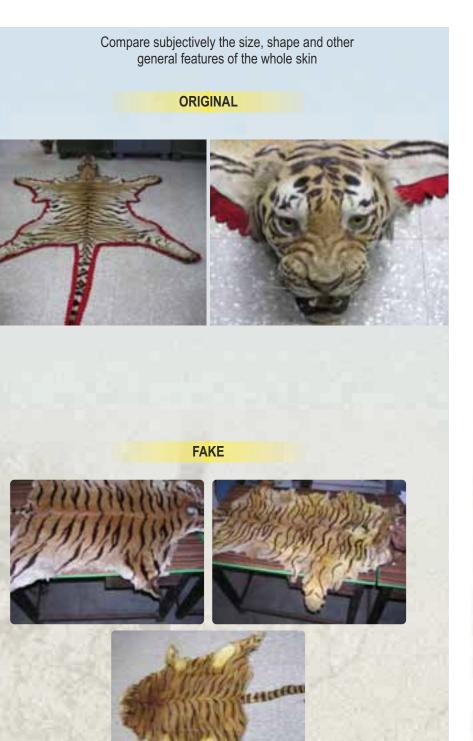




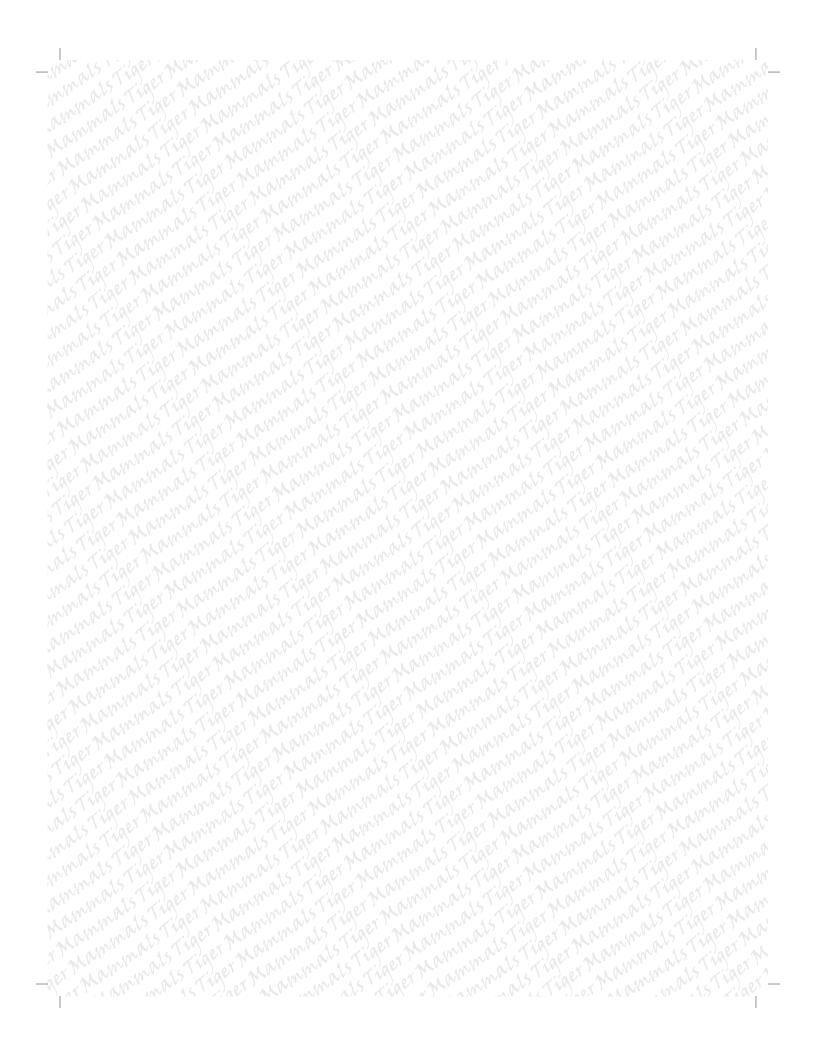








Identification note on Skull (Felidae)



Introduction:

The Family Felidae comprises: Seven species of 'Big cats' in 3 genera:

- The genus Panthera: lions (*P. leo*), tigers (*P. tigris*), leopards (*P. pardus*), jaguars (*P. onca*), snow leopards (*P. uncia*)
- The genus Neofelis: clouded leopards (N. nebulosa)
- The genus Acinonyx: cheetahs (A. jubatus).

Thirty species of 'Small cats' in the genus Felis. The felid family consists of two major subgroups, the saber-toothed and the feline cats, to which all extant species belong, and are the most anatomically derived of all carnivores for predation on large prey with a precision killing bite. The Felidae is made up of two distinct evolutionary lineages, the modern cats, often referred to as the Felinae or true cats, and the extinct sabretoothed cats.

Modern cats are characterized by being anatomically derived for predation with a powerful precision killing bite 3–5. Sabretoothed cats were often highly different from modern cats in cranio-mandibular morphology. The skull morphology in modern cats will divide these into two groups; large species, encompassing the Panthera cats (lion, jaguar, leopard, tiger, and snow leopard), and small cats, respectively, with some taxa (puma, Neofelis) occupying intermediate positions between the two

Skull: The skeletal framework of a vertebrate head is called a skull. The skull is bony case articulating with the cranial end of the vertebral column. The bones of the head are divisible in two groups; a) those which form the skull proper. b) those forming parts of the visceral skeleton or splanchnocranium, which are the mandible, the hyoid bone and the middle ear ossicles. The skull proper is divided into two parts: a) the cranium which surrounds and protects the brain; b) the facial portion which supports the nose and the eyes.

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The cranial portion of the skull proper is composed of eleven distinct bones, the occipital, the inter parietals, the two temporal, the two parietals, the sphenoid, the presphenoid, the two frontals and the ethmoid.

The facial portion of the skull proper contains thirteen bones: the 2 maxillaries, 2 premaxillaries, 2 nasals, 2 palatines, 2 lacrimals, the vomer and the 2 molar or zygomatic bones. The two halves of the mandible are often included in the bones of the face.





Tiger Skull:

General Information:

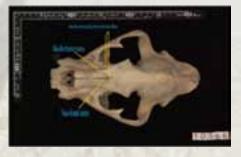
- The skull of the tiger is stout and rounded in shape which provides more support for their powerful jaws.
- Tigers' powerful jaw muscles are attached to a bony ridge that lay on top of the skull
 called the sagittal crest. These muscles function to rapidly clamp down on prey with
 crushing force. The sagittal crest is a bony ridge on top of the tiger's skull that
 attaches its powerful jaw muscles.
- Tigers have fewer teeth than other carnivores such as dogs (42 teeth) with only 30 teeth.
- Tigers have the largest canines of all big cat species ranging in size from 6.4 to 7.6 centimeters (2.5 to 3.0 in) in length. Tigers are capable of penetrating deeply into their prey because of the large gap between the carnassials (back teeth) and the canines hold prey tightly.
- The small incisors located in the front of the mouth (between the two top and bottom canines) enable the tiger to pick off meat and feathers from their prey.





Identifying Characteristics

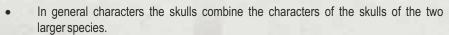
- Tigers have a reduced- s i z e d clavicle (collarbone).
- Tiger skull is more or less like a crown shape.
- The nasal bones are very convex throughout their length; Nasals projecting beyond maxillae.

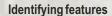


- The external opening of the nasal fossae is relatively narrower than that of Lion (the other big cat).
- The inter-orbital space is narrower and always convex; the forehead is also narrower and arched.
- Frontal area elevated, facial portion shorter as compared with cranial and I e s s
 massive.
- Inferior edge of lower jaw not convex in the middle. The jaw joints do not side to side movement, making the bite stronger and firmer

Leopard Skull General Information:

- In general characters the skulls combine the characters of the skulls of the two larger species.
- The development of the sagittal crest, and the inflation of the forehead, the highest point of which may be in front of the postorbital processes or behind them.
- The fore part of the cranial portion being more compressed so that the postorbital area or is lengthened and narrowed.
- The skulls of leopards will "rock " to a varying degree backwards and forwards like a lion's when on a horizontal plane; but sometimes, as
 - shown by an adult skull from Ashkote in Kashmir, they rest as steadily as a tiger's. (Pocock, 1939).





- The skull is elongated and sleek.
- It has convex dorsal profile due to the elevation of the frontal region.
- The nasal bones in leopard skulls may fall short of the maxillae as in lions or surpass them as in tigers, but they never

surpass them to the same extent as in typical tigers.

Prominent canine grooves

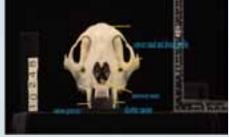












Lion skull frontal view

Leopard skull frontal view

Lion Skull General Information:

- The skull is massive with huge jaw-closing muscles.
- The morphology of the skull of Panthera leo is considered to exert powerful forces at the level of the canines when closing its jaws.
- The inferior border of the mandible has a rather

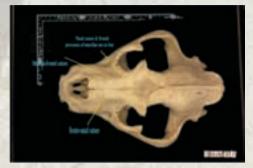


convex form; below the carnassial, this border presents a sort of tuberosity which is more or less pronounced

• The Lion skull (top) is generally flatter and the face is upturned

Identifying features:

- The nasal bones are flat or slightly convex, especially toward their frontal extremities.
- The external opening of the nasal fossae is relatively wider; it w i d e n s r e g u l a r l y beginning at the lower part.
- The inter-orbital space formed by the frontals is wider, flatter and even commonly excavated;
- The Lion has a forehead which is wide and flat, transversely as well as longitudinally.



Comparative Chart of 3 species of genus Panthera on Skull

Panthera tigeris	Panthera leo	Panthera pardus
Skull large, in adult of up to about 13 or 15 in. long (Pocock, 1939). Nasals projecting beyond maxillae; frontal area elevated; facial portion shorter as compared with cranial and less massive; inferior edge of lower jaw not convex in the middle, do not rock on flat surface. Lateral surface of maxillae is slanted and with a deep slope.	Nasals not projecting beyond maxillae; frontal area flatfish; facial portion longer as compared with cranial and more massive; inferior edge of lower jaw lightly convex in the middle can rock on flat surface; dorsal surface of the nasals are relatively flatter, less steeply	Skull smaller, in adult of up to about 9 in. (Pocock, 1939), typically in shape and proportions more like that of tigers, but nasals not projecting so far beyond maxilla. In general characters the skulls combine the characters of the skulls of the two larger species i.e. tiger & lion. The dorsal surface of the nasals are very convex; the lateral surface of maxillae is convex with very little slope or inclination.

Skulls in trade

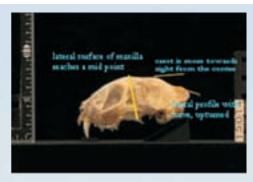
Parameters	Lion	Tiger	Leopard	Leopard Cat	Clouded Leopard	Jungle Cat	Pallas Cat	Dog	Cow
Width/Length (Frontal View)	1.347	1.396	1.03	1.614	1.49	1.661	1.467	1.609	.970
Width/ Length (Lateral View)	.691	.683	.659	.393	.371	.376	.474	.380	.269
C1/Skull Height	0.32	0.413	0.32	.36	.396	.34	.192	.22	Canines absent
Canine Width/skull width	0.25	0.275	0.234	.212	.235	.209	.214	.64	NA
Nasal length/Skull length	0.34	0.38	0.35	.27	.378	.33	.24	.25	.312

C1-upper canine;

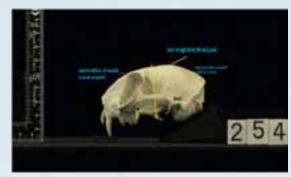
Canine width- minimum distance between the two upper canines;

Nasal length- full length from the ventral tip of the lateral extensions to the point of truncation.





Jungle cat



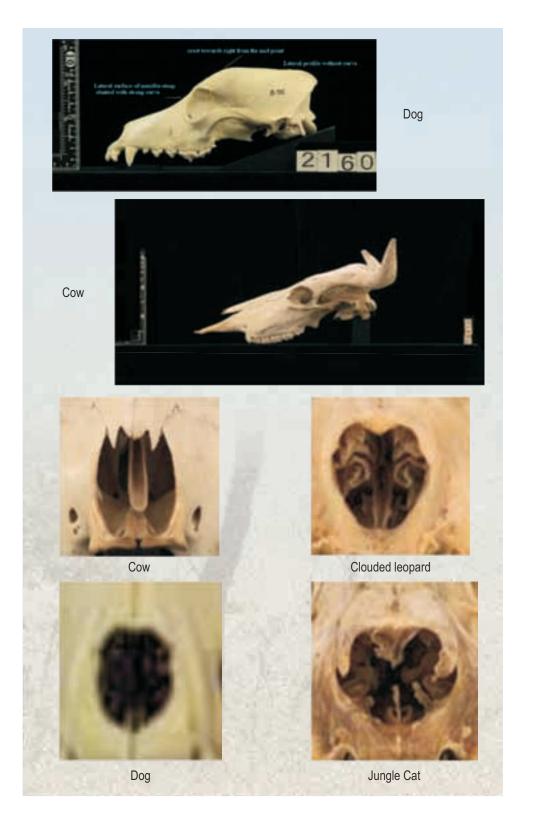
Leopard cat



Pallas Cat

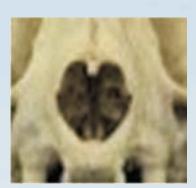


Clouded leopard









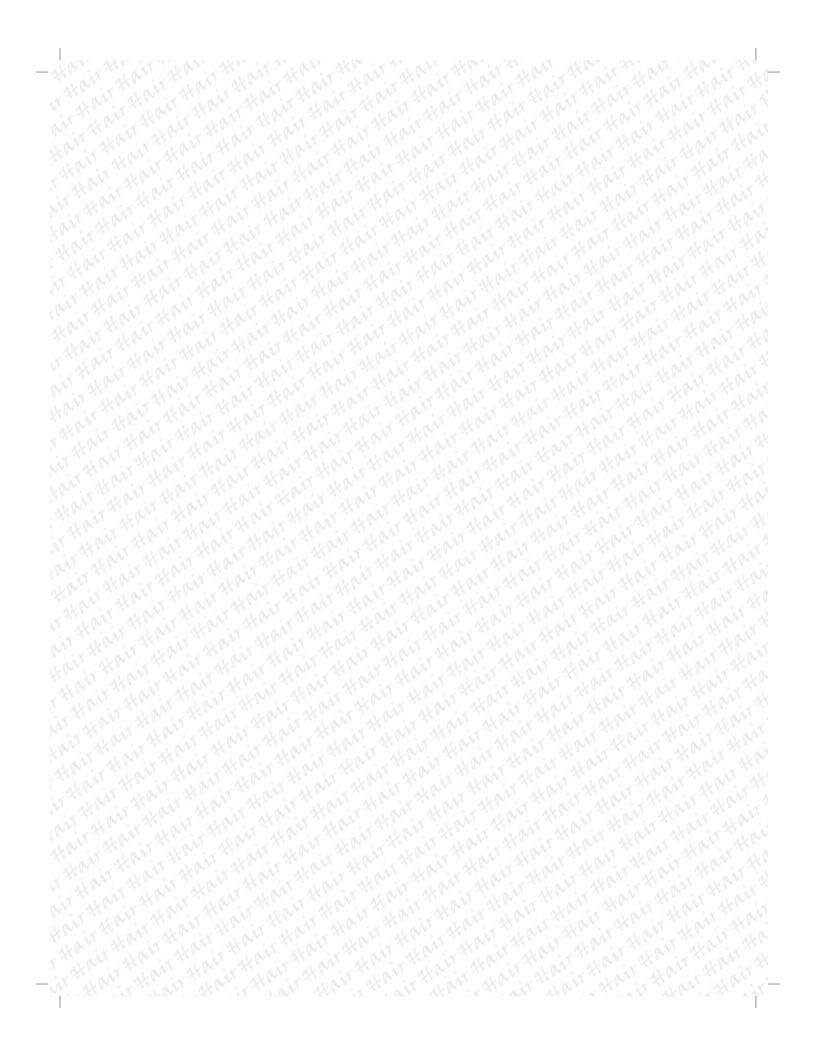


Leopard Cat

Pallas Cat

Parameters	Lion	Tiger	Leopard	Leopard Cat	Clouded Leopard	Jungle Cat	Pallas Cat	Dog	Cow
Lateral View	Skull profile relatively more flatter, snout, more upturned	skull profile rounder, snout, more downturned	Skull profile round without a curve	Skull profile round without a curve, lateral surface of maxilla is round, crest lies on right side of mid point	Skull profile is flat without a prominent crest.	Lateral surface of maxilla reaches the mid point and crest lies beyond the mid point, skull profile with curve, upturned	Skull profile snout, rounded, without a curve, rounded crest on right side from the center.	Skull profile without curve, lateral surface of maxilla slanted with a strong curve, crest on right side from the	Skull profile without curve, more or less flat

Microscopic HAIR Signature Pattern of Indian & Exotic Mammals



Index

- Introductory Note on Hair
- Documentation required- Trade of Exotic Wild Species
- Tools used
- Annexure
- Chapter 1
- Chapter 2
- References

Chapter-1 **EXOTIC SPECIES**

- 1. Badger (Mellivora capensis)
- 2. Cashmere (Capra hircus laniger)
- 3. European Rabbit (Oryctolagus cuniculus)
- 4. Gray Fox (Urocyon cineroagenteus)
- 5. Kangaroo (Macropus spp.)
- 6. Mink (Neovison spp.)
- 7. Opossum (Didelphis spp.)
- 8. Rabbit black (Pentalagus furnessi)
- 9. Raccoon-I (Procyon lotor)
- 10. Raccoon- 2 (Procyon lotor)
- 11. Spring Buck (Antidorcas marsupialis)
- 12. Vicugna vicugna
- 13. Weasel (Mustela nivalis)
- 14. Zebra (Equus burchelli)





Chapter-2 INDIAN SPECIES

- 1. Goat (Capra spp.)
- 2. Horse (Equus ferus caballus)
- 3. Jackal (Canis spp.)
- 4. Ox (Bos taurus)
- 5. Pashmina (Capra hircus)
- 6. Fake leopard impression on bovine skin
- 7. Fake zebra impression on bovine skin

Introductory Note on Hair

- Hair can be defined as a slender, thread-like outgrowth from a follicle in the skin of mammals.
- Composed mainly of keratin, it has three morphological region she cuticle, medulla, and cortex.
- Each region has certain characteristics which help in forensic examination.

Medulla and Medullary Index

- Central core of cells that may be present in the hair.
- If with air, appears as black or opaque structure under transmitted light.
- If with mounting medium, appears clear or translucent in transmitted light.
- In human hairs, the medulla is generally amorphous, whereas in animal hairs, its structure is frequently very regular and well defined.
- Medullary index (diameter of medulla/ diameter of hair shaft)
 - Humans < 0.33
 - Animals > 0.5
- Varies by species

Cuticle and Cuticular Structure

- The cuticle is a translucent outer layer of the hair shaft consisting of scales that cover the shaft.
- The cuticular scales always point from the proximal or root end of the hair to the distal or tip end of the hair.
- Cuticular scale structures are an important forensic characteristic.
- There are three basic scale structures that make up the cuticleoronal (crown-like), spinous (petal-like), and imbricate (flattened).
- Combinations and variations of these types are possible





Documentation Required- Trade of Exotic Wild Species

Export:

 Appendix I, II & III species of CITES- Prior grant and presentation of Export Permit by Management Authority.

Import:

- Appendix I of CITES-Import Permit and Export/Re-export Certificate
- Appendix II of CITES-Export/Re-export Permit.
- Appendix III of CITES-Certificate of origin & Export Permit.

Tools used

Apparatus -

 Olympus Microscope, glass slide, coverslip beaker, glass rod, dropper, forcep, magnifying glass, etc.

Chemicals -

Gelatin, Hydrogen Peroxide solution, Acetone,
 Distilled Water, Canada Balsam, etc.

Software -

Cool ruler to calculate Medullary Index

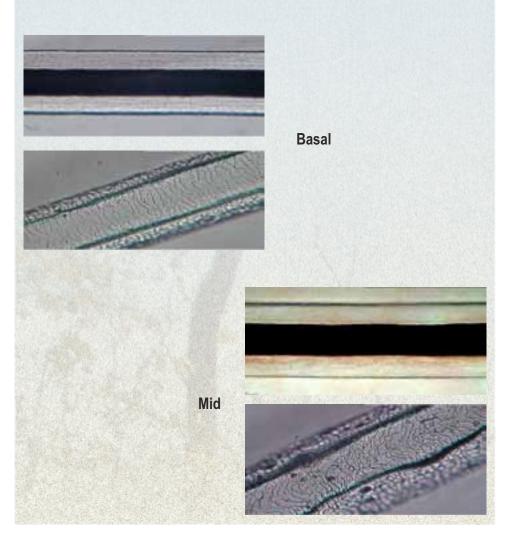


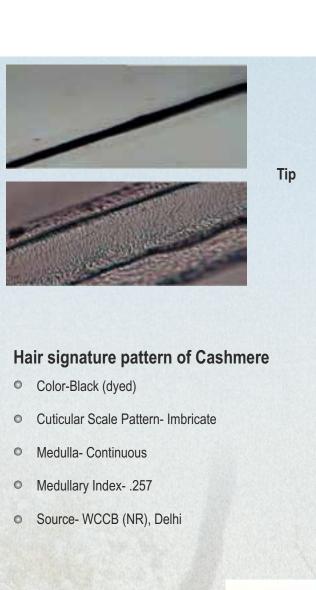
Chapter 1 EXOTIC SPECIES



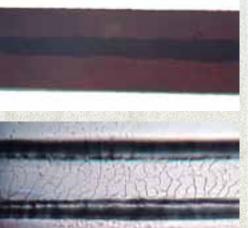
Hair signature pattern of Mellivora capensis (Badger) Hair

- Color- White, brown towards the tip
- Cuticular Scale Pattern- Imbricate or flattened scales Scales with narrow margin
- Medulla- Amorphous
- MedullaryIndex- 0.438
- Source- WCCB (HQ), Delhi



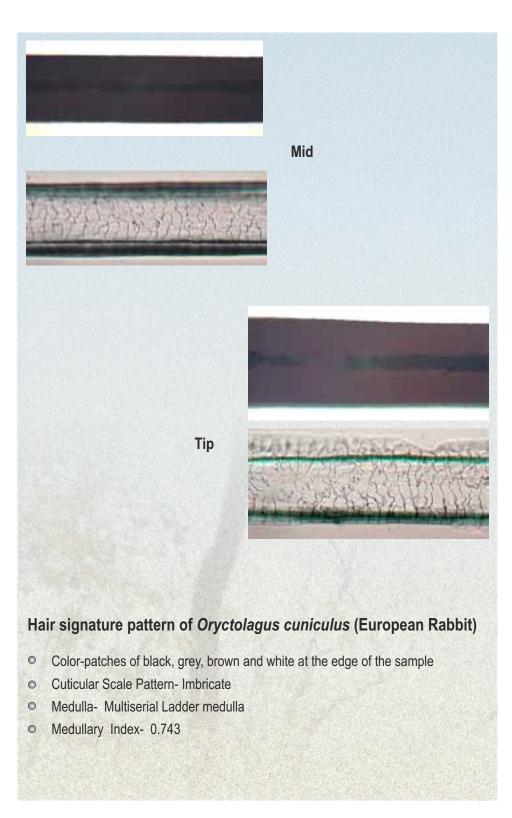


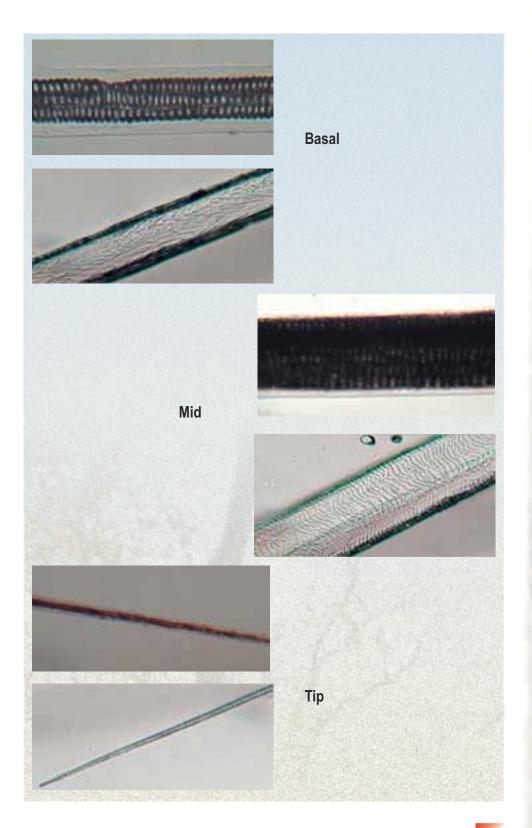










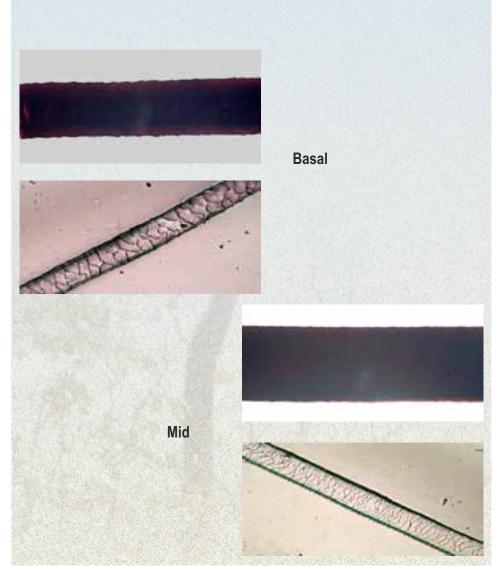


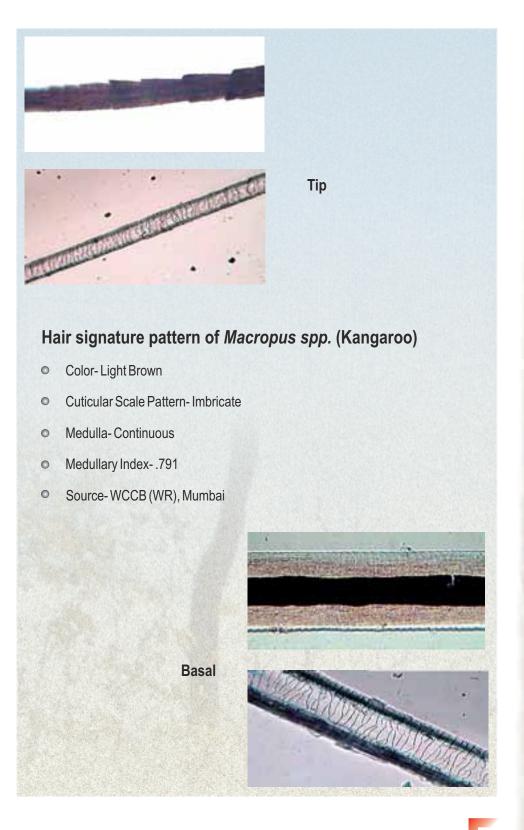




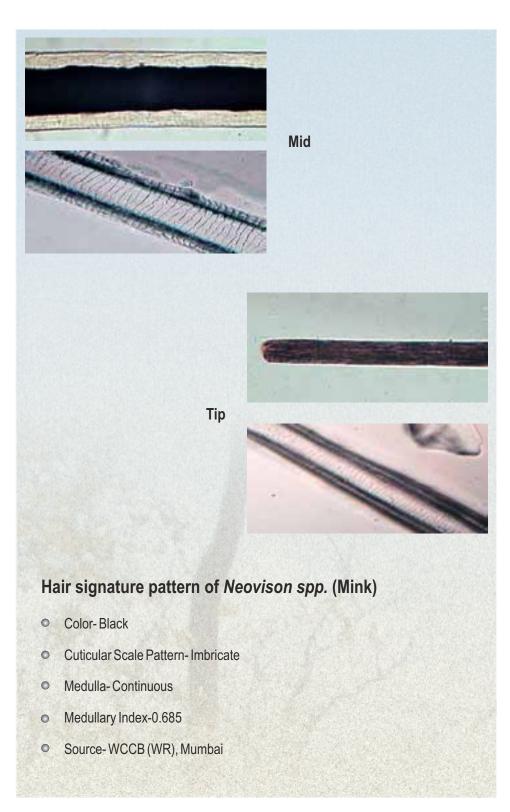
Hair signature pattern of *Urocyon cineroargenteus* (Gray Fox)

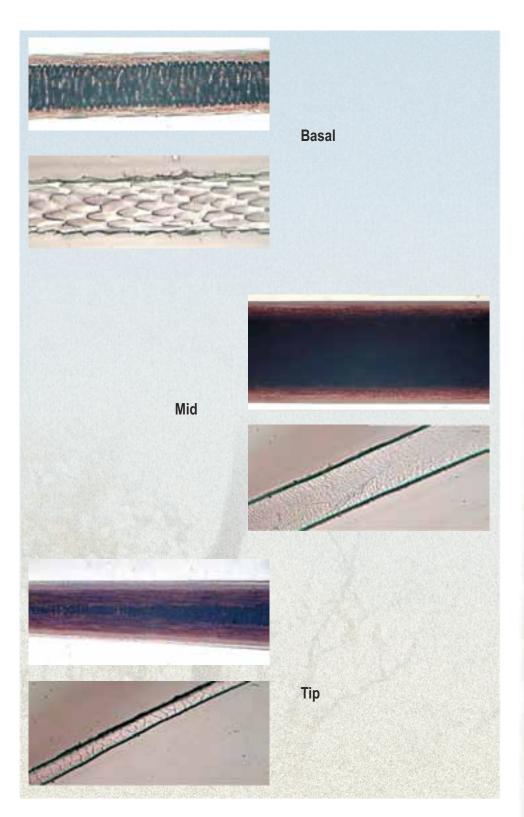
- Color- Gray with light brown patches (dyed)
- Cuticular Scale Pattern- Imbricate
- Medulla- Continuous
- Medullary Index- .710
- Source- WCCB (WR), Mumbai





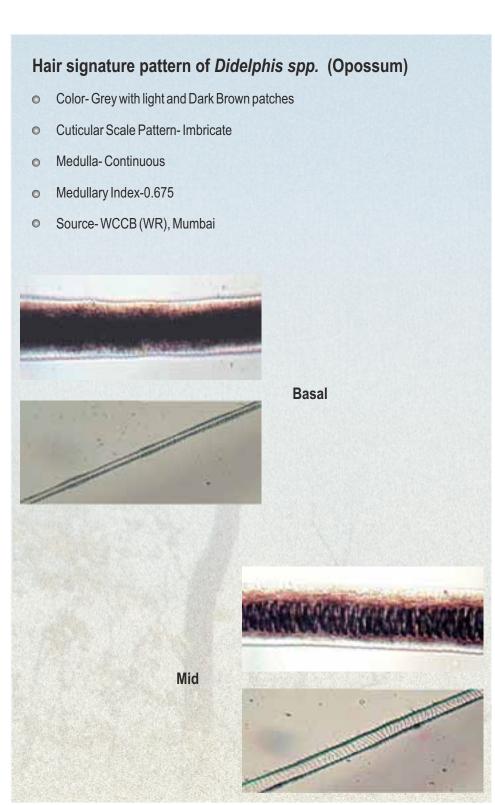


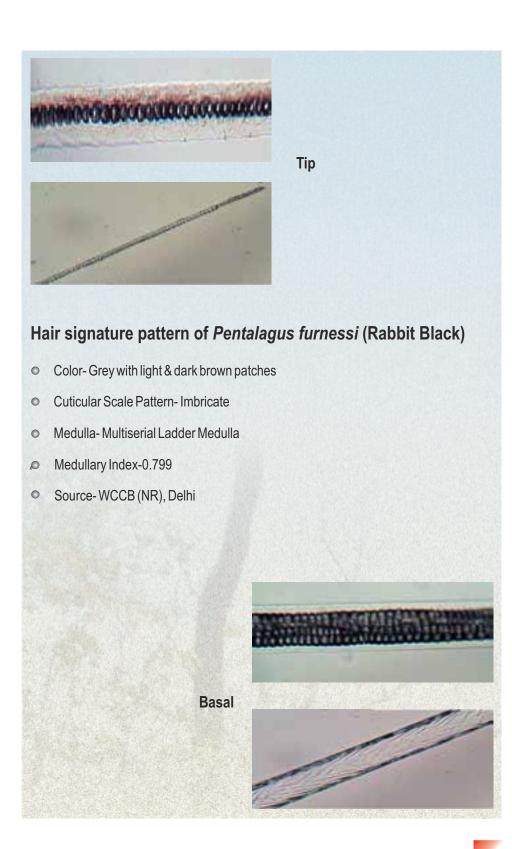




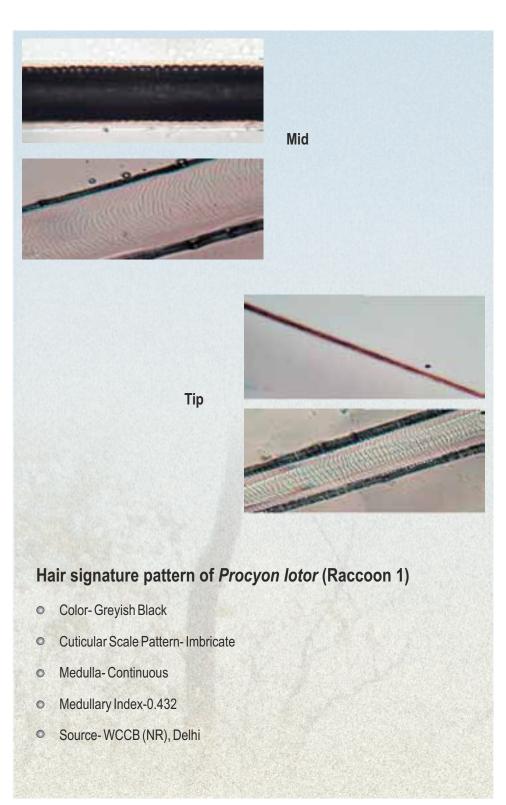


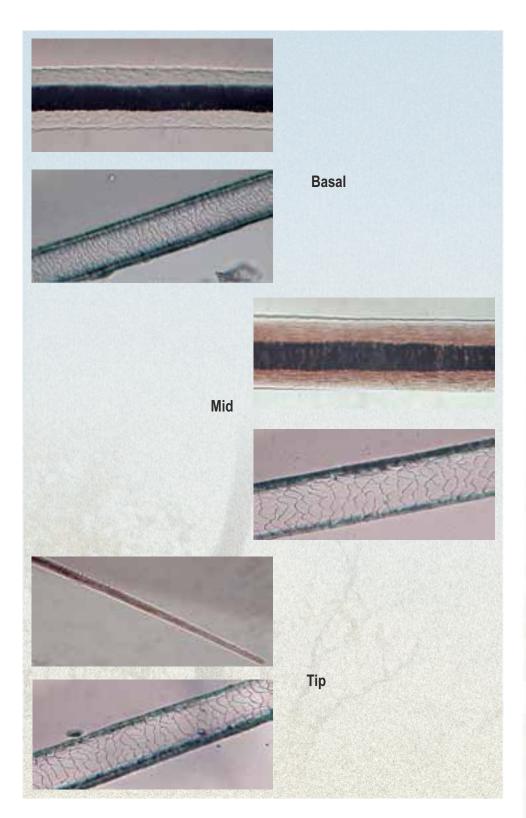










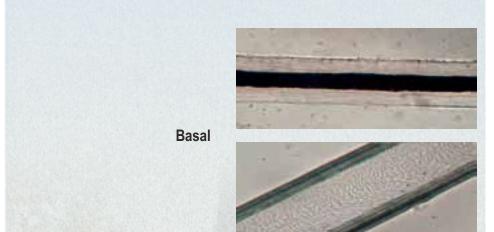


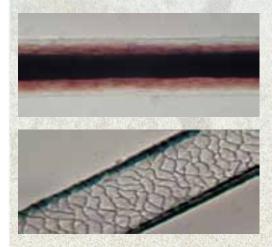




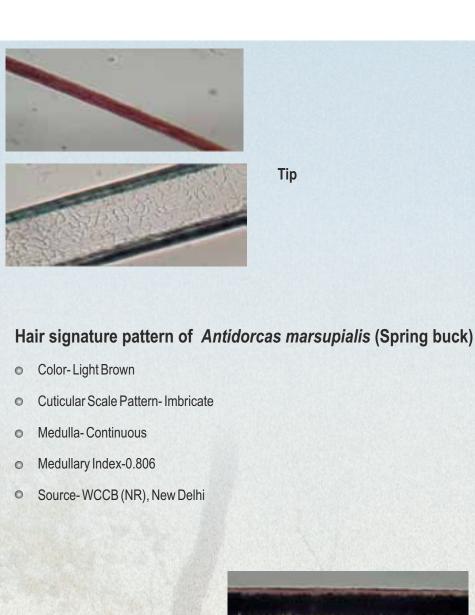
Hair signature pattern of *Procyon lotor* (Raccoon 2)

- Color-Light Brown
- Cuticular Scale Pattern-Imbricate
- Medulla-Continuous
- Medullary Index-0.425
- Source-WCCB (NR),Delhi

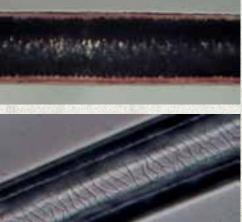




Mid

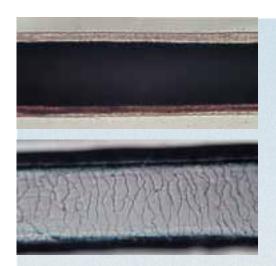












Mid

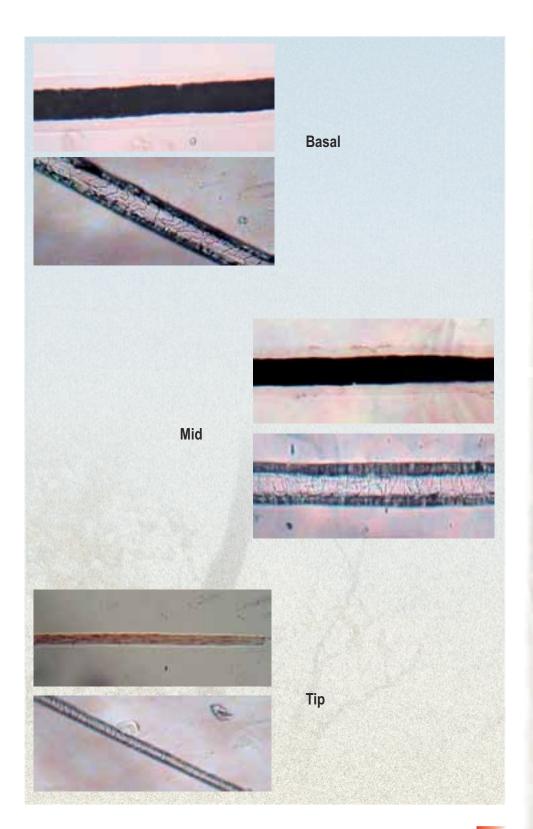






Hair signature pattern of Vicugna vicugna

- Color- Imbricate with irregular waves
- O Cuticular Scale Pattern- Pale brown, chestnut brown hair strand
- Medullary Pattern-Continuous
- Medullary Index-0.649
- Source-WCCB (HQ), Delhi





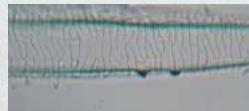


Hair signature pattern of *Mustela nivalis* (Weasel)

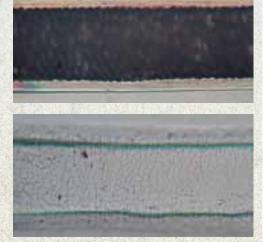
- Color- Light Brown
- Cuticular Scale Pattern-Imbricate
- Medulla-Continuous
- Medullary Index-0.704
- Source-WCCB (CR), Jabalpur

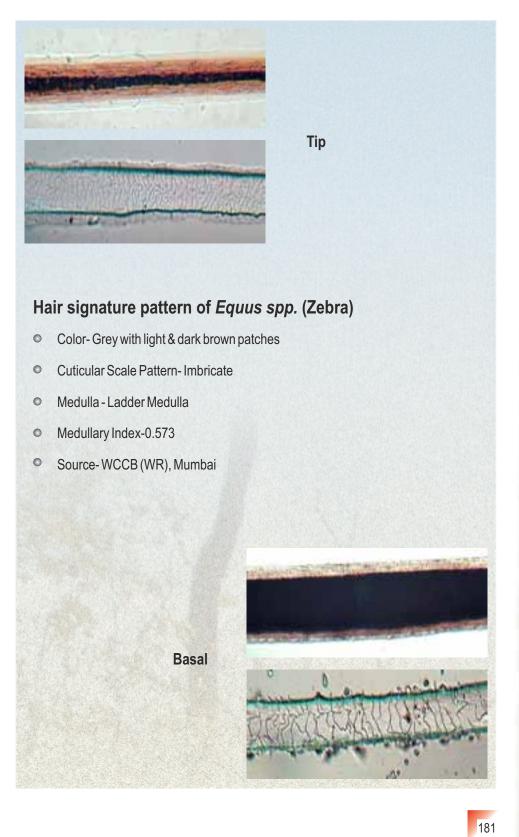


Basal

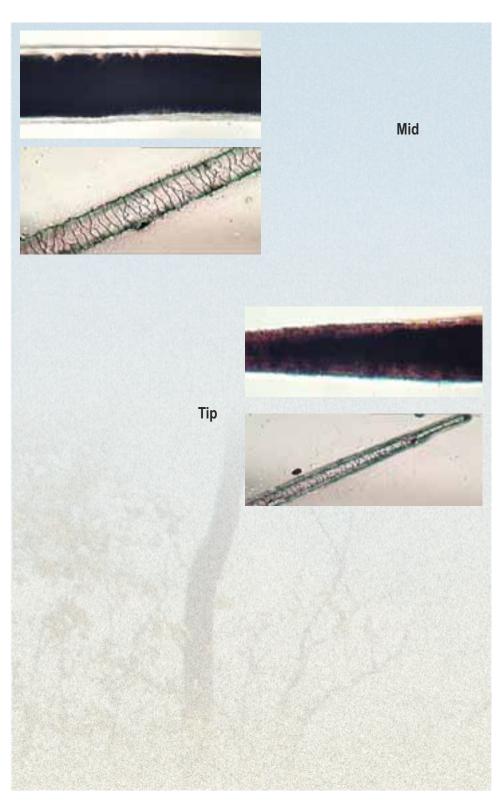


Mid





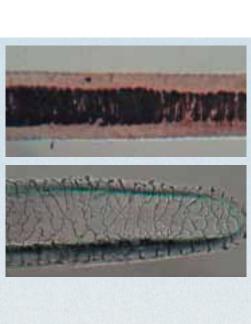




Chapter 2 INDIAN FAUNA



Hair signature pattern of Capra spp. (Goat) Color-Light Brown dyed Cuticular Scale Pattern-Imbricate Medullary Pattern-Continuous Medullary Index-0.646 Source-WCCB (CR), Jabalpur Basal Mid

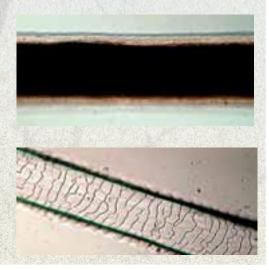


Tip

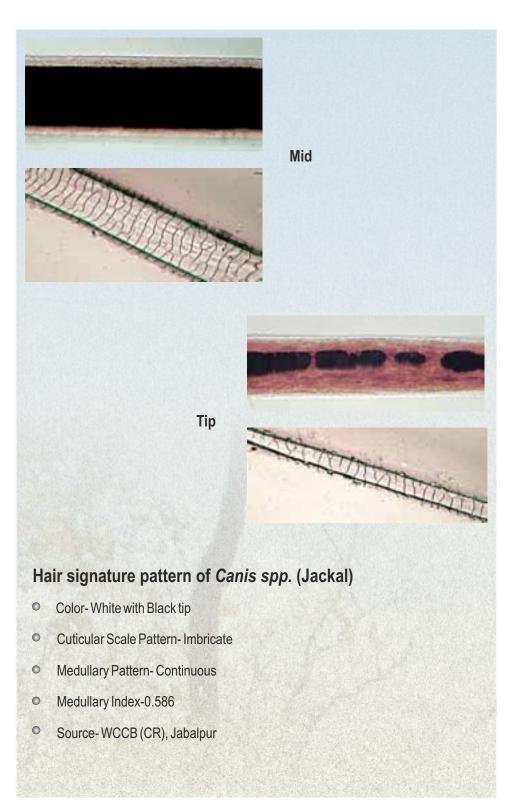
Hair signature pattern of Equus ferus caballus (Horse)

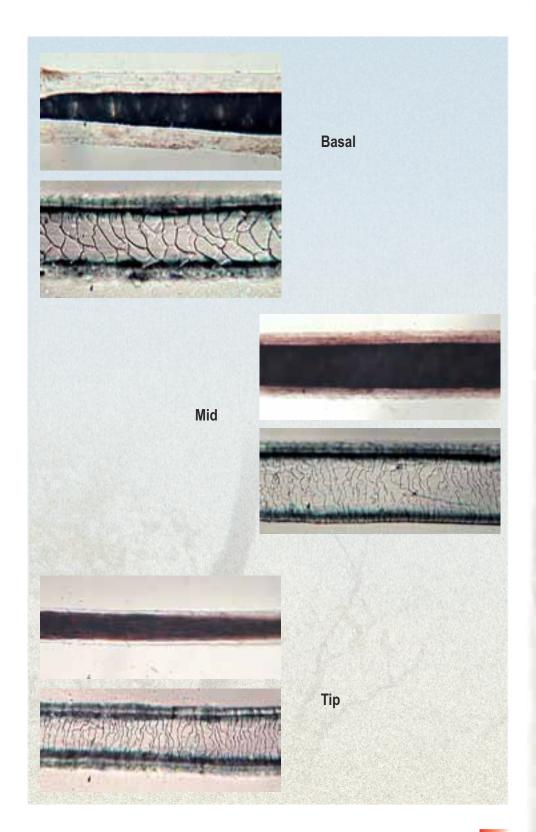
- Color-Buff Colour
- Cuticular Scale Pattern-Imbricate
- Medulla Continuous
- Medullary Index-0.474
- Source-WCCB (WR), Mumbai

Basal









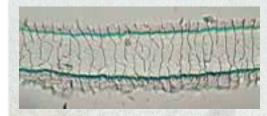




Hair signature pattern of Bostauraus (Ox)

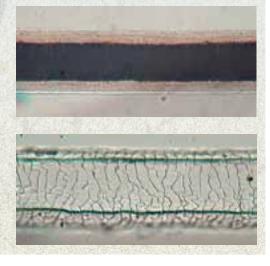
- Color-Black
- Cuticular Scale Pattern-Imbricate
- Medullary Pattern- Continuous
- Medullary Index-0.51
- Source-WCCB (CR), Jabalpur

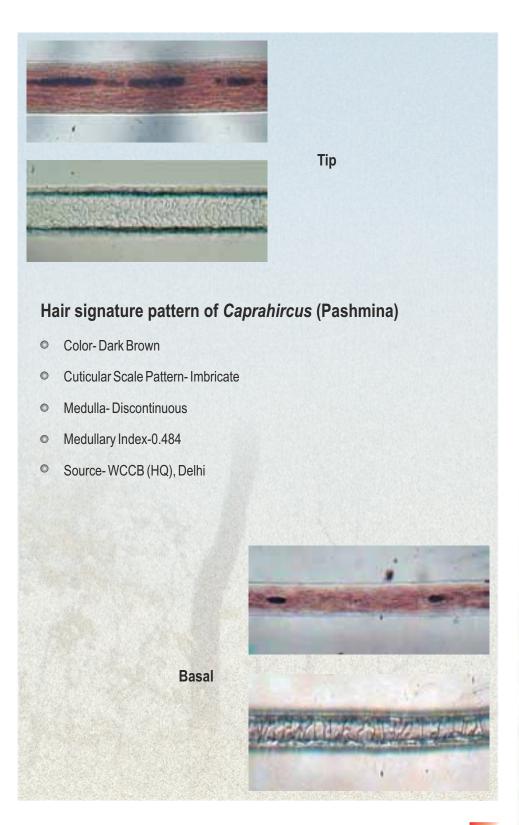




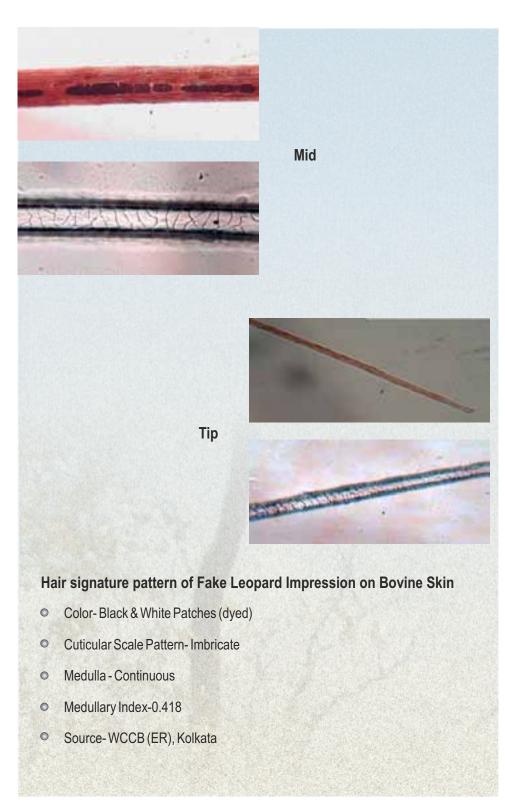
Basal

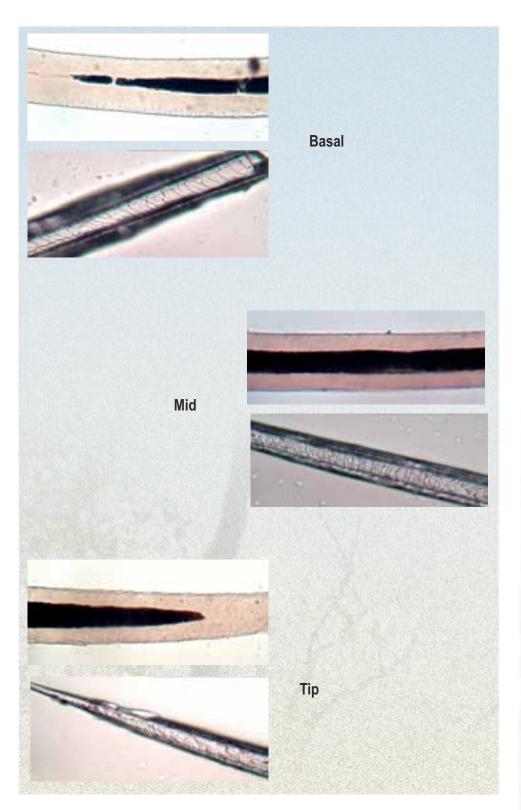














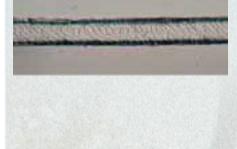


Hair signature pattern of Fake Zebra Impression on bovine skin

- Color-Black & White Patches (dyed)
- Cuticular Scale Pattern-Imbricate
- Medulla Continuous
- Medullary Index-0.724
- Source-WCCB (ER), Kolkata



Basal







Tip

Mid













Identification Manual on Birds



Exotic Birds



INTRODUCTION BIRDS

Kingdom: Animalia Phylum: Chordata Class: Aves (Evolution of birds)

Birds are warm-blooded bipedal vertebrates that lay hard-shelled eggs. They are characterized by bony beaks, hollow bones, feathers and forelimbs modified as wings. In short, birds can be called Feathered Bipeds. Since birds are warm-blooded, their body is covered with insulating feathers to maintain an even temperature. Size of the birds can vary from the tiny flower peckers & hummingbirds, to the huge Ostrich and the Sarus Crane. In India, other than the Sarus Crane, the Himalayan Bearded Vulture or Lammergeier is the biggest bird and the tiny Tickell's Flowerpecker is hardly bigger than a human thumb. Most birds are capable of flight, but some larger birds like Penguins, Ostrich and Kiwi are flightless. Depending on different scientific classifications, as of today there are over 9000 bird species (1250 in India), with almost 150 having become extinct after the arrival of Humans. The Sibley-Ahlquist taxonomy, based on extensive DNA-DNA hybridization, has resulted in the Sibley-Monroe checklist which has revolutionized the whole system of bird classification.

Birds have a keen eyesight and good hearing but their sense of taste and smell is poor. Birds are generally diurnal (active during the day), some are nocturnal (active during the night), some crepuscular (active during twilight hours) and some nocturnal & crepuscular both. Many birds migrate long distances with change in seasons to maximize feeding hours and/or to breed in suitable habitats. Arctic Terns migrate twice every year from Arctic to Antarctica and back (over 15,000 km one way!). Some birds, like the Wandering Albatross, spend most of their time at sea. Some, such as frigate birds, stay aloft for days at a time, even sleeping on the wing. The large variety of bird food includes honey, nectar, seeds, grains, vegetable matter, insects, larva, spiders, fish, molluscs, rodents, reptiles, small mammals, carrion or other birds.

Usefulness of birds

Birds are very useful as destroyer of pests. A big proportion of birds' diet consists of insects (and their larva), including many that are highly injurious to man. A large number of birds feed on rodents and mice, both very destructive for farmers all over the world. Vultures, Crows, Kites and Egrets feed on carrion and waste in garbage dumps. These birds play an invaluable part in keeping our environment clean and disease-free.

Birds are also an important food source for humans. The most commonly eaten species is the domestic chicken (a descendant of the Red Jungle fowl and its eggs, although geese, pheasants, turkeys and ducks are also widely eaten. Other birds that are used for food include partridges, grouse, quails, pigeons, emus, ostriches and doves. Along with bees, birds such as the Purple Sunbird, are important pollinating agents. Birds as seed dispersers play an essential for the propagation of many species of trees and plants. Other examples include Homing pigeons to carry messages, Falcons for hunting and Cormorants for fishing. Chickens and pigeons are used in experimental research in biology and comparative psychology.

Many species have become extinct through human activities like excessive hunting, logging, large scale use of insecticides and pesticides in agriculture and industrial pollution. Two birds that have become extinct in India in the not too distant past are Mountain Quail and the Pink-headed Duck.

Numerous species have come to depend on human activities for food and are widespread to



the point of being pests. They have adapted well to the rapid urbanization and growth in human population. For example, the House Crow and Rock Pigeon thrive near human habitation in large parts of the world. While in addition to these two species, the Common Myna, Bank Myna and Black Kite are thriving in India; Vultures (Aegypiinae) and the House sparrow are facing an inexplicable decline in their population.

BIRD TRADE:

Fluctuation in the population of wild fauna and flora is a natural phenomenon. There are no specific reports indicating about the population of birds which is dwindling in the country. Exotic bird trade is dominated by an increasing trend which exists to meet the demand of specialist collectors for some of the world's rarest species. In the garb of selling muniyas which are allowed for trade under law, the dealers are making the protected species such as Straw-headed Bulbul Pycnonotus zeylanicus, Palm Cockatoo Probosciger atterrimus, available to customers at exorbitant prices. The global demand is huge and hence trade is flourishing, threatening the renowned biodiversity hotspots in South-east Asia - as well as rising demand from countries within South-east Asia for endemic species from Africa, South America and Australasia.

In the garb of pet trade, several threatened and endemic species are being smuggled outside and in the country. Alexandrian and plum-headed parakeets, the trade of which is banned under the Wildlife Protection Act, 1972. Plus a pair of peacock chicks, and a mature male, protected as a Schedule I species, which means they have the same legal cover as the tiger.

India has a tremendous altitudinal variation; the climate of this country greatly varies from tropical heat to arctic cold of the snowy mountains. Because of this drastic change in climatic conditions, there is a different type of plant life in different parts of this country. The bird life primarily depends on the type of vegetation that exists in different climatic zones, which can be broadly divided into (1) Tropical and Sub Tropical (2) temperate, and (3) Alpine. India is home to some 1,200 different species of birds. The trade and trapping of all indigenous birds are banned under Indian law i.e. Wildlife (Protection) Act, 1972 (WPA) and the trade of exotic birds are regulated by the Convention on International Trade in Endangered Species (CITES).

In India, Northern States are more prone towards birds' trapping. Northern parts of Bihar and Uttar Pradesh are the hot spots for birds capturing- mainly around the Gangetic plain and in the foothills of the Himalayas. Other types of birds are found in the south in Orissa, Madhya Pradesh, Maharashtra and Deccan Plateau. Assam and the higher areas in the north east are also rich in bird species. A major component of bird trade consists of parakeets caught from wild, an act which is in direct violation of the Indian Wildlife (Protection) Act, 1972. As per the law caging and displaying parrots and parakeets, as fortune tellers which is very common in the country is a punishable offence which can fetch a fine and up to five years in prison to an accused. Despite this, bird markets continue to flourish openly in many places. Some of the main bird markets in India include the Nakhas in Lucknow, Hati Bagan and Hoga market in Kolkata and Crawford Market in Mumbai.

Birds are illegally transported on trains (recently such cases were detected). Poachers bring thousands of birds from the forests of India to the cities, packed into small boxes. Sixty percent of birds die on the journey because of broken wings and legs, thirst or fright. It is estimated that for every bird who reaches his her final destination, two die on route. Fledging birds are captured from their nests, and other birds are caught in traps and nets, which can cause serious injury or death to the innocent birds.

1 Hyacinth Macaw is the largest macaw and the largest flying parrot species in the world. Distribution: The hyacinth macaw is native to central and eastern South America and is found in lightly forested, seasonally flooded grasslands in Brazil, Bolivia and Paraguay. They are very sociable birds.





Identification: Bright blue plumage with yellow highlights. Mouth talks, neck bows, looks side to side, body sways. Illegal pet trade is one of its worst enemies.

Legal Status: Appendix II

Trade: The Birds' number is declining due to over collection for illegal pet (cage) trade from wild; for zoos & circus.

Affected States: Mainly West Bengal especially Kolkata.

 Rosella is one of five to eight species of colorful Australian parrots in the genus Platycercus Platycercus means "broadtailed" or "flat-tailed", reflecting a feature. Common to the rosellas and other members of the broad-tailed parrot tribe. Their diet is mainly seeds and fruit.

Distribution: Rosellas are native to Australia and nearby islands, where they inhabit forests, woodlands, farmlands, and suburban parks and gardens. They are confined to the coastal mountains and plains and are absent from the outback. Introduced



populations have also established themselves in New Zealand (notably in the and in north Dunedin) and Norfolk Island.



Size: 26-37 cm.

Identification: Rosella are medium sized parrots, long tails, distinctive cheek patches, sexual dimorphism is absent/slight, males & females have similar plumage.

The juveniles have green based plumage

Legal Status: Appendix II
Trade: Ornamental Cage Birds



3. The Rainbow Lorikeet, (Trichoglossus haematodus) is a species of Australasian parrot remains widespread and often common. It is therefore considered to be of Least Concern by Bird Life International.

Distribution: It is found in Australia, eastern Indonesia (Maluku and Western New

Guinea), Papua New Guinea, New Caledonia, and Vanuatu.

Size: 25-30 cm.

Identification: The Rainbow Lorikeet is very colorful-almost every color of the rainbow can be found on their feathers. Dark blue or violet blue head & stomach, a bright green back, tail & vent and an orange breast & beak. Rainbow Lorikeet often travels together in pairs & occasionally responds to calls to fly as a flock. Several subspecies have darker scalloped markings across the orange or red breast.

Legal Status: Appendix II of CITES.

Trade: As beautiful cage bird the illegal trade is flourishing in Indian market. Fetching good amount of money from the buyers.



4. The Cockatiel (Nymphicus hollandicus), also known as the Quarrion and the Weiro, is the smallest and genuinely miniature cockatoo endemic to Australia. They are prized as a household pet and companion parrot throughout the world and are relatively easy to breed

Distribution: Cockatiels are native to Australia where they are found largely in or semi-arid country, but always near water. Largely nomadic, the species will move to where food and water is available. They are typically seen in pairs or small flocks. Sometimes hundreds will flock around a single such body of water. To farmers' dismay, they often eat cultivated crops.





Size: 300-350 mm

Identification: Grey plumage with prominent white flashes on the outer edges of each wing. Male has yellow/white face while female is grey/light grey and a round orange area on both ear areas are often referred as "cheek patches" present in both genders. The bird has long tail feathers roughly making up half of its total length. The cockatiel is the smallest & only parakeet type of cockatoo species.

Legal Status: Appendix II of CITES

Trade: Illegal Pet trade; For Circus, kept in zoos &

travelling Zoos.

Affected States: West Bengal, Bihar & Kerala.

5. A Lovebird is one of nine species of the genus Agapornis. They are a social and affectionate small parrot. Eight species are native to the African continent, while the Grey-headed Lovebird is native to Madagascar. Lovebirds are small, stocky versions of parrots, with a large hooked upper beak.

Distribution: Eight of the nine lovebird species come from Africa, the remaining one from Madagascar.







Size: 13-17 cm.

Identification: Light weighted (40-60 gm). Love birds are smallest parrots, stocky build, short blunt tail, sharp beak. Wild love birds are mostly green with variety of other colors n their upper body, prominent white ring around their eyes.

Legal Status: Appendixx II of CITES.

Trade: Illegal Pet (cage) birds. High

demamds in Indian Market.

Affected States: West Bengal & Andhra Pradesh are the main hub for trade.

The Scarlet Macaw (Ara macao) is a large, colorful macaw. Distribution: Scarlet Macaws originate in the humid lowland subtropical rain forests, open woodlands, river edges, and savannas of Central and South America. The habitat of the Central American Scarlet Macaw runs through the extreme eastern and southern regions of Mexico and Panama, but also through Guatemala and Belize.





Size: 70-80 cm (approx.)

Identification: Crimson red plumage, blue rump & tail feathers, the upper wings are yellow, the upper sides of the flight feathers of the wing are dark blue; tail flight feathers and under sides of the wing are dark red with metallic gold iridescence.

Legal Status: Appendix I of CITES

Trade: Scarlet Macaw is having a very good market

value in India as pet (cage) birds, circus.

Affeted States: West Bengal, Bihar & Kerala are the

common places for the macaw trade.

7. **The Victoria Crowned Pigeon** is very different from the pigeon we see in towns and cities. The crowned pigeon is quite spectacular, being blue in color and as tall as a turkey (74 cm). It has a large rest of feathers on its head that can be raised - hence its name. It is the largest of all living pigeons and is found in the wild only in New Guinea and some smaller offshore islands nearby.





Distribution: The Victoria Crowned Pigeon is distributed in the lowland and swamp forests of northern New Guinea and surrounding islands. Its diet consists mainly of fruits, figs, seeds and invertebrates. The female usually lays a single white egg.

Identification: The Victoria Crowned Pigeon, Goura victoria, is a large, approximately 74cm (29 in) long and weighing up to 2.5 kg (5.5 lb), bluish-grey pigeon with elegant blue lace-like crests, maroon breast and red iris. The bird may be easily recognized by the unique white tips on its crests. Both sexes are similar.

Legal Status: Appendix II of CITES

Trade: Ornamental pet bird trade, for meat in some parts of country, zoos & circus

8. The African Grey Parrot (Psittacus erithacus) is a medium-sized parrot; Experts regard it as one of the most intelligent birds. They feed primarily on palm nuts, seeds, fruits, leafy matter, and have even been observed eating snails. This has led many to be captured from the wild and sold into the pet trade. The African Grey Parrot is listed on CITES appendix II, which restricts



trade of wild caught species, because wild populations cannot sustain trapping for the pet trade.





Distribution: The African Gray Parrot is endemic to primary and secondary rainforest of West and Central Africa.

Identification: The African Gray Parrot is a talkative parrot with bright red tail feathers these are smaller in size, have a darker charcoal gray coloring, African Gray Parrot (Psittacus erithacus) gets the name from its slate gray feathers. It has a very striking crimson tail and yellow eyes.

Legal Status: Appendix II of CITES

Trade: Illegal Bird Trade for circus, zoos, aviculture.

9. **Finches** are small, compactly built birds r a n g i n g i n l e n g t h f r o m 10 to 27 cm (3 to 10 inches). Most finches use their heavy conical bills to crack the seeds of grasses and weeds. Many species supplement their diet with insects as well. The nestlings are unable to crack seeds and so are usually fed insects. Many finches are brightly coloured, often with various shades of red and yellow.

Distribution: There are hundreds of finches. They have been enjoyed as pets all over the world, with some having been domesticated for over 500 years.





Identification:

The male House Finch has a length of about 5 1/2 inches, with red on the head, upper breast and flanks. In some regions the color red may be replaced with yellow or orange. This is due to the differences in regional diets. The female has a uniformly brownstreaked head with broad brown streaking on the breast and belly. The under tail coverts are usually unstreaked.

Indian Birds

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INTRODUCTION

BIRDS

Kingdom: Animalia Phylum: Chordata Class: Aves (Evolution of birds)

Birds are warm-blooded bipedal vertebrates that lay hard-shelled eggs. They are

1. **Alexandrine Parakee**t (Psittacula eupatria) It is a widespread resident in India. **Size: 53 cm**

Distribution: India, Sri Lanka, Afghanistan, western Pakistan, and Andaman Islands. Common in Northern India. In Sri Lanka numbers are declining and this parrot is now rare. Large flocks common on the Andaman Islands. Prefer woodland and forest, coconut plantations and trees in parks and gardens.





Identification: Male - General plumage green.Rose-pink collar. Purple patch on wings. Tail: green, tipped with yellow. Beak: red with a paler tip. Pale yellow eyes. Green-grey legs. Female - Duller than male. No pink collar. Shorter tail. Juvenile - Similar to female. Call: Screams and screeches.

Legal Status: Schedule IV of W(P) A, 1972.

Trade: Involved in Pet Bird Trade, ornamental cage bird, aviculture. Affected States: Throughout India for cage bird trade and in North East part of

India most species are eaten rather than pet trade.

2. **Plum-headed Parakeet** (Psittacula cyanocephala)

Size: 36 cm

Distribution: India, Sri Lanka, Nepal, and Bhutan. In Sri Lanka, is common along the foothills in open woodland. In India, is common near cultivated land and in parks and towns. Not as common in Nepal.







Identification: Male - Generally green. Deep red head. Lower cheeks and collar black. Blue-green band on neck. Greenblue under wing, dark red patch on upper wing. Blue tail tipped with white, yellow side feathers. Orange-yellow upper beak, brown-black lower. Pale yellow eyes. Green-grey legs. Female - Dull blue head. Yellow collar. No red wing patch. Upper beak pale yellow, lower grey. Juvenile - Green head. Orange forehead. Tail shorter than adult's. Yellow beak. Call: Shrill in flight, quieter notes when perching.

Legal Status: Schedule IV of W (P) A,

Trade: Ornamental cage bird trade in India and International markets.

3. Rose-ringed Parakeet (Psittacula krameri)/ Indian Ring-necked Parakeet- is a common resident in India.

Size: 42 cm

Distribution: India, Bhutan, Nepal, Afghanistan, Sri Lanka, Pakistan, Bangladesh, Myanmar and North Africa. Introduced to Mauritius, South Africa, Arabia, the Middle East, Hong Kong and Singapore. Feral populations in Britain, USA and Europe. Common near farms and plantations and where there are trees.





Identification: A parrot with generally green plumage. Yellowish under wing and lower abdomen. Long bluish-green tail, tipped with yellow. Sharp deeply hooked red beak. Pale yellow eyes. Green-grey legs. Male: Black across chin and lower cheek. Rose-pink collar. Female: No black on chin and cheeks. No rosepink collar. Shorter tail than male. Juveniles: Similar to female. Coral-pink beak. Grey-white eyes. Grey legs. Call: Screeching when flying or perching. Quiet whistles and chattering

when roosting.

Legal Status: Schedule IV of W(P)A, 1972.

Trade: Illegal pet trade for cage bird, zoos and as food in some parts of the country.

Affected States: Almost all the states are in the grip of its trade.

4. The Red-whiskered Bulbul (Pycnonotus jocosus) is a member of the bulbul family of passerine birds. It feeds on fruits and small insects and they conspicuously perch on trees and their calls are a loud three or four note call. The distinctive crest and the red-vent and whiskers make them easy to identify.

Size: 20 cms. Weight: 23-42 gms

Distribution: This particular bulbul has adapted well to trees and shrubs in large suburban areas or yards. These birds usually stay under cover of



vegetation, but occasionally perch in the open. This bird is native to India, Nepal, Bangladesh, Burma, and the South China coast. It has been introduced to the Malay Peninsula, Singapore, Nicobar Islands, Mauritius, Australia, North America, and the Hawaiian Islands.



Identification: Black head with red patch (the whiskers) behind the eye; slender beak, oval shaped nostrils with bristles, short legs 7 toes, wings short & rounded, rounded to squared tail shape, brownish above & white below the abdomen; loud & clear voices. Immature bulbuls resemble adults except that lack of the red marking on the head.

Legal Status: Schedule IV of W (P) A, 1972

Trade: These birds are frequently kept as cage pets; sports (bird fights).

Affected States: East Uttar Pradesh, Punjab, Bihar.

Peregrine Falcon (Falco peregrinus) is a winter

visitor in India. The species name, "peregrinus" (from pilgrim), means "wanderer", referring to their extensive world-wide range.

Distribution: They are found among high mountains, hills, stony semi-desert, ocean coasts and open wetlands near cliffs. The Peregrine Falcon is anatomically adapted for extremely swift flight. When pursuing prey, these falcons can swoop down at incredible speeds in excess of 300 km per hour!







Size: 40-50 cm.

Identification: Peregrine falcons are about the size of a crow, with slim wings that taper to pointed tips. In flight, the wings angle back at the wrists and the wing beats are rapid. The plumage of male and female adults is similar, females are always larger. Adults are black, white and slate gray overall, with a white breast and heavily barred under parts. Bold "cheek-wedges" below each eye form a distinctive black helmet over the head. Juveniles are brown and beige, with dark, heavily streaked under parts. The legs are yellow and tipped in razor sharp talons that along with

the toothed-beak are adapted to rip and tear meat. Calls: The Peregrine Falcon gives a slow, scolding and ascending "rehk, rehk, rehk" when alarmed.

Legal Status: Schedule IV of W(P)A; CITES Appendix I Trade: Illegal Bird trade for sports (bird fights & falconry).

Affected States: Uttar Pradesh, Bihar, Punjab.

Bank Myna (Acridotheres ginginianus) is a Myna/Starling occurring in South Asia from Sind, Pakistan to Bangladesh. It is similar in colouration and shares its range with the Common Myna, but is slightly smaller.

Distribution: Sind, Pakistan, on the West, covering the greater part of northern India, east to Bangladesh, south to approximate latitudes of Mumbai, Maharashtra (19N) / Balasore, Orissa (21N), except for drier regions in Rajasthan. Distribution is patchy, but most commonly in major river valleys.





Identification:

A stocky, bluish-grey mynah with a deep orange bill and eye patches. Noticeably smaller and greyer than the Common Mynah. Other differences include coloration: pale bluish grey instead of brown, also the black crown has a sharp boundary as opposed to a gradation, naked skin round eyes brick-red instead of yellow, wing-patch and tips of tail-feathers pinkish buff instead of white. Sexes are alike. Juveniles are paler and browner. Also seen in markets e.g. Old Delhi, surreptitiously hopping onto vendors' handcarts to steal scraps.

Legal Status: Schedule IV of W (P) A, 1972. **Trade:** To fulfill the demand of the hill myna in domestic market the bank myna is dyed and sold

as a substitute for the former. Illegal Pet Trade sometimes for food.

7. The Barn Owl (Tyto alba) is the most widely distributed species of owl. It is also referred to as Common Barn Owl, to distinguish it from other species in the barn-owl family Tytonidae. Owl can turn its head 135 degrees in either direction; it can thus look behind its own shoulders, with a total 270-degree field of view.





Size: 25-45 cm

Identification: The bird is a pale, long-winged, long-legged with short squarish tail. Barn owl has light face, black eyes with odd appearance like a flat mask. Tails in wavering motion and the open dangling feathered legs are the distinguishing features during flight. The ridge of feathers above the bill somewhat resembling a nose. Buff and grey (especially on the forehead and back) feathers in most subspecies.

Trade: Barn Owls are considered to be death Owl, Ghost Owl or Devil Owl. These owls are hunted and traded for

black magic.

Legal Status: Schedule IV of W(P)A, 1972.

Affected States: Bihar, West Bengal, Madhya Pradesh, Uttar Pradesh, Andhra Pradesh.

8. Indian Eagle Owl (Bubo bengalensis) also known as Rock Eagle Owl, Bengal Eagle Owl.

Distribution: They are found in hilly & rocky scrub forests. Humid evergreen forests & pure deserts are avoided. It spends the day under the shelter of a bush or rocky projection or in a large mango or similar thickly foliaged tree near villages.







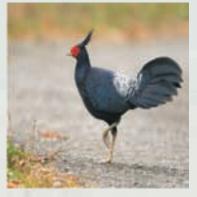
Identification: Large owls; tufts on head; they are splashed with brown & gray and have a white throat patch with black stripes. They have a deep resonant call that may be heard at dawn & dusk. The nesting season is November to April. The eggs number three to four & creamy white, ovals with smooth texture, laid on bare soil under the shelter of a bush on level ground.

Legal Status: Schedule IV of W (P) A, 1972.

Trade: Illegal bird trade for black magic and body parts. **Affected States:** Bihar, Uttar Pradesh, Madhya Pradesh, Andhra Pradesh for black magic & North Eastern States for body parts.

9. The Khalij Pheasant, Lophura leucomelanos, is a pheasant found all along the foothills of the Himalaya in a number of local populations with variations. They are also found (though somewhat rare) in the islands of Hawaii, where it is considered an invasive species because it consumes and disperses seeds of invasive plant species.

Size: 55-75 cm





Identification: Bare red face & grayish legs. Makes have partially glossy bluish black plumage with white rump & underparts in some subspecies & in others the tails & underparts are white with most feathers densely vermiculated with black. Females are overall brownish. In some subspecies the underparts are distinctly markd in whitish & balck, while in others most feathers are pale-edged, resulting in a scaly appearance.

Legal Status: Schedule IV of W (P) A, 1972.

Trade: Illegal Bird trade for meat/ table bird trade

Affected States: Most Indian states especially eastern, North East India/ Tamil Nadu

10. The Black-headed Munia, Lonchura atricapilla alsoknown as Chestnut Munia. The Black-headed Munia is a small gregarious bird which feeds mainly on grain and other seeds. It frequents open grassland and cultivation. The nest is a large domed grass structure in a bush or tall grass into which 4-7 white eggs are laid.

Distribution: The Bird is a resident breeding bird in Bangladesh, Brunei, Cambodia, China, India, Indonesia, Laos, Malaysia, Burma, Nepal, Philippines, Singapore, Taiwan, Thailand, & Vietnam.





Size: 11-12 cm

Identification: The Black-headed has a stubby pale grey bill, black head, and brown body. Some races also have a black belly. The sexes are similar, but immature birds have uniform pale brown upperparts, lack the dark head and have white to pale buff under parts.

Trade: Live Birds for pet (cage bird) trade, aviculture, bird release.

Affected States: Throughout India for cage bird trade and mainly Delhi, UP, Rajasthan & Gujarat for Bird release. Legal Status: Schedule IV of W (P) A,

1972

11. **Hill Myna** (G. religiosa typically found in forest and cultivation.

Distribution: Hill myna is a resident breeder from Kumaon division in India (80° eastern longitude) east through Nepal, Sikkim, Bhutan and Arunachal Pradesh, the lower Himalayas, terai and foothills up to 2000 m ASL. Its range continues east through Southeast Asia northeastwards to southern China, and via Thailand southeastwards across northern Indonesia to Palawan in the Philippines.

Size: 25-30 cm.







Identification: Glossy black plumage and large white wing patches which are obvious in flight. It has black plumage, purple-tinged on the head and neck. There are large white wing patches which are obvious in flight but mostly covered when the bird is sitting. The bill and strong legs are bright yellow, and there are yellow wattles on the nape and under the eye.

Trade: Live Birds for pet (cage bird) trade, aviculture; very high demand in International & Domestic Markets.

Affected States: Almost all the states of India are

affected by its trade.

Legal Status: Schedule I of W (P) A; CITES Appendix II

12. **The Indian Peafow**l is a resident breeder in the Indian subcontinent. The peacock is designated as the national bird of the Republic of India and the provincial bird. Peafowl are best known for the male's extravagant tail, which it displays as part of courtship. The male is called a peacock, the female a peahen.

Identification: The male (peacock) Indian Peafowl is about 2.12 m (7.3 ft) in length in full breeding plumage (107 cm/42 in when not) and weigh 4–6 kg (8.8-13.2 lbs) has iridescent blue-green or green coloured plumage. The so-called "tail" of the peacock, also termed the "train," is not the tail quill



feathers but highly elongated upper tail coverts. The female (peahen) Indian Peafowl is about 86 cm (34 in) long and weigh 2.75–4 kg (6-8.8 lbs), has a mixture of dull green, brown, and grey in her plumage. She lacks the long upper tail coverts of the male but has a crest.

Legal status: Schedule I of W (P) A, 1972.

Trade: Poaching for their feathers.

Identification Notes on Peacock Feathers

General Information:

- Feathers are one of the epidermal growths that form the distinctive outer covering, or plumage, on birds.
- Although feathers cover most parts of the body of birds, they arise only from certain well-defined tracts on the skin.
- They aid in flight, thermal insulation, waterproofing and coloration that helps in communication and protection.
- "The male peacock tail contains spectacular beauty because of the brilliant, iridescent, diversified, colorful eye patterns,"
- Male peacocks shed and re-grow tail feathers each year. The plumage is prized throughout the world as an exotic decoration
- The feathers' bright colors are ·produced not by pigments, but rather by tiny, intricate two-dimensional crystal-like structures.

Parts of a feather:

- 1. Rachis- The rachis is the central shaft of the feather;
- 2. Calamus- The calamus at its base inserts into the skin of the bird
- 3. Barbs Down or plumulaceous barbs are found at the base of the feather, and assist with insulation. Pennaceous barbs are found toward the tip of the feather, are most often visible to the observer, and provide protection to the bird by barrier and/or coloration.



- 4. Vane The vanes are the cumulation of the plumulaceous and pennaceous barbs on either side of the rachis
- 5. Afterfeather- The afterfeather is a structure attached to the undersurface of the rachis near the calamus, and its morphology varies with family.

Identifying Features:

- The iridescent plumage of the peacock originates in the fine side branches of the feathers.
- Every branch carries a series of brightly colored spots.
- The actual color depends on the exact position of the spot on the branch and on the angle of the incident light.





Naturally Shed Peafowl feathers:

- Naturally shed feathers are generally a fully grown and developed.
- Naturally shed feathers lack presence of blood on the root tip. Therefore, give negative test for blood.
- The tip of the naturally shed feathers is conical with a narrow end with upturned margins.

Plucked Peafowl feathers:

- The plucked feathers are generally not fully grown or developed. These are commonly the immature feathers.
- These feathers have comparatively a less conical tip and the with everted margins
- It may show the presence of blood on the root surface of the feather



Test for Blood: The presence of blood on the surface of the root can be depicted by the following:

- Leucomalachite green (LMG) color test: This chemical reagent undergoes a chemical interaction with blood, yielding a characteristic green color.
- Kastle-Meyer color test: Phenolphthalein is the active chemical reagent in this
 particular test. When blood, hydrogen peroxide, and phenolphthalein are mixed
 together, a dark pink color is developed. This color change is due to the hemoglobin
 (the oxygen-containing molecule within red blood cells) causing a chemical reaction
 between hydrogen peroxide and phenolphthalein.
- 13. **Green Avadavat or Green Munia** (Amandava formosa) This species is found mainly in the dry scrub regions and agricultural lands and is often found close to water.

Distribution: The key areas where they are well known are in central India, around southern Rajasthan, central Uttar Pradesh, southern Bihar and West Bengal extending south to southern Maharashtra and northern Andhra Pradesh. There are some records from further south from Wynaad in northern Kerala and it is unclear if these are wild populations.





Identification: Small bird with distinctive green and yellow avadavat, dark flank bars & reddish bill; upper plumage olive green; pale yellow chin & the lower breast; belly & vent are brighter yellow; waxy red bill; pale fleshy or brown legs. Both sexes have pale tips; female is slightly paler than male.

Legal Status: Schedule IV of W (P) A, 1972. **Trade:** The Green Avadavat has been a popular cage-birds and has been in the bird trade since the late 19th century.



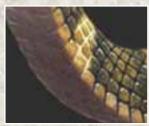














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INTRODUCTION

Reptiles form one of four classes of terrestrial vertebrates including mainly crocodiles, turtles/tortoises, snakes and lizards. Most reptiles play an important role as predators in the natural eco-systems as also against agricultural pests to help mankind but this is little appreciated. Yet they have been a part of folklore, religious beliefs, etc. The volume of trade in their skins, etc. has had serious repercussions on their populations in the wild thus forcing their inclusion for protection under the Wildlife (Protection) Act 1972. Enforcement has however been difficult mainly due to the problem in identification of these species especially in products where only a portion has been used.

Adequate technical/scientific knowledge as well as practical experience is required for correct identification of species, offence detection and handling of seizures by officials in all the enforcement agencies. This includes not only forest department fat also customs, central excise, coast guard, railways, postal and police department fat also customs, central excise, coast guard, railways, postal and police department for swell as the Directorate of Revenue Intelligence, Central Bureau of Investigation, Border Security Force, etc., who are normally not familiar with the species (or their products) being traded / smuggled illegally. The problem is compounded by the trade of fakes as well, so there is a need to not only distinguish between species but also between genuine items and fakes. A simplified and concise easy to handle identification manual cum field guide has therefore been a long tell need to assist all enforcement agencies in implementation of the legal provisions to control illegal trade in wildlife/wildlife articles and this book is an attempt to do so.

First of all, one must observe the patterns, shine, texture, etc. Burning a small portion would emit smell like that of burnt hair if it is organic (or natural) whereas it may smell like burning plastic / milk if made of synthetic materials. Nowadays, even cow skin can be embossed to give appearance of reptile skin or fur. However, a natural skin would not be as uniformly patterned as a duplicate whether synthetic or organic. In snake-skin imitations, an artificially embossed/etched item, it would not have proper scales that can be easily lifted or removed.



The information given above regarding general identification, commonly traded species and articles, places involved and modus operandi is meant as a basic guide for enforcement with details given under each species. The species covered are as per the Wildlife (Protection) Act 1972 as amended by the Wildlife (Protection) Act 2002 (w.e.f. 1-4-2003). Information has been compiled from several references for the purpose of this manual an unenviable and laborious task taken up with determined enthusiasm and diligence by our young technical assistant Shri Rakesh Burman. Our two wildlife inspectors Shri G.L. Purohit and Shri Sheshadri have also chapped in with tips based on practical experience. Thanks are also due to our UDC Shri N. M. Rane who initiated the work by collecting and storing photographs as well as photographing specimens available in this office and to English stenographer Shri Jawkar for typing the manuscript. Last but not the least a very special thanks to ZSI, Pune who have always supported us in our endeavours and given immediate response to our calls for help and to ZSI, Kolkata for permitting us the use of photographs from their excellent publications.

EASTERN HILL TERRAPIN (TERRESTRIAL) FAMILY - EMYDIDAE

W(P)A Schedule I

Scientific Name: Melanochelys tricarinata (Blyth)

CITES Appendix 1



Common Name : Bengali - Shila Kochop.

Identifying Features:

- Elongated and distinctly arched carapace with Tkeels.

 Colour black or brownish above with vellow

 Dark head, sometimes with
- Colour black or brownish above with yellow keels.
- Digits lack webbing almost entirely or half webbed.
- Undersurface vellowish brown.
- Maximum shell length upto 17 cm.

Distribution:

India Assam, Uttar Pradesh, North Bengal, Chhotanagpur (Bihar) Abroad Nepal and Bangladesh.

Remarks: Omnivorous in captivity. Inhabits hillsides of the deciduous forests. Its habits appear to be almost entirely terrestrial. Status indeterminate, probably vulnerable. Largely exploited for its eggs and meat by the local tribals. They are threatened due to their habitat destruction also.

* Also listed in Schedule IV as "Three keeled Turtle (Geoemyda tricarinata)"

KERALA FOREST TERRAPIN (TERRESTRIAL) FAMILY - EMYDIDAE

Scientific Name: Hoesemys silvatica Henderson

W(P)A Schedule I CITES Not listed



Common Name: Kannada - Battadh, Tamil - Vengal aamai.

Identifying Features:

- Depressed carapace with 3 keels (tricarinate), feebly reverted and non-serrated posterior margin.
- Colour brown above and yellow below. Two brown/yellow blotches on bridge. Upper portion of forehead and jaws bright yellow.
- Hooked upper jaw. Head large
- A red spot on top of snout. Large eyes with scarlet iris.
- Limbs and tail black or brown.
- Small terrestrial terrapin with length upto 12 cm.

Distribution:

India Kerala, Kamataka (Endemic).

Abroad No Records.

Remarks:

Species was recently rediscovered. Found mainly in the evergreen forest undergrowth and bamboo groves of lower altitude. Omnivorous in nature. Threatened mainly by loss of its rain forest habitat. The liver of this turtle is supposed to be an effective medicine to cure bleeding piles and that is why it is killed.

INDIAN TENT TURTLE (FRESHWATER) FAMILY-EMYDIDAE

W(P)A - Schedule 1 CITES - Appendix I

Scientific Name - Kachuga tecta tecta (Gray)

[Syn. - Emys tectum, E. trigibbosa, Pangshura dura, Kachuga tectum.]







Dursal view

Ventral view

Head & neck (enlarged)

Common Name - North Indian roofed turtle. Indian tent turtle. Indian sawback. bai

Identifying Features:

A rather small species with a relatively short tail.

Second vertebral shield is characteristically longer than the fixed.

- Third vertebral shield pentagonal, not too eloparated. Share midback keel is seen. arising on its posterior margin, ending its backward pointing spine.
- Sides are very elevated, flat and tent like.
- · Brown/olive green coloured carapace with a red median stripe (on first three vertebral shields) & small black spots.
- · Plastron is reddish of pinkish vellow with two or three black blotches on each shield that form a symmetrical pattern. The rim of the shell is pinkish-yellow.
- Typical red marking is present behind each eye. Head is blackish, temporal region orange or yellow.
- Many fine yellow longitudinal lines are present on blackish neck.
- Limbs are dark olive spotted with yellow. Digits are fully webbed.
- Maximum shell length 18-23 cm. Males smaller than the female ones.

India - Ganga, Brahmaputra & Narmada river systems. Abroad - Pakistan (Sind river system), Bangladesh.

Remarks: It is a fully aquatic species inhabiting freshwater bodies full of aquatic vegetation, its main food. It is not a great swimmer and comparatively less active species. It retracts the head and forelimbs, everting hind limbs to push itself forward in a peculiar defensive habit. This species has become extremely vulnerable due to over exploitation for eggs and meat as well as habitat destruction. Removing sand, hydro-electric projects, etc. destroy the nesting and feeding areas of this species.

SAIL TERRAPIN (FRESHWATER) FAMILY - EMYDIDAE

Scientific Name : Kachuga kachuga (Gray)

W(P)A Schedule I CITES Appendix-II



Common Name: Bengali - Adi kori katha, Hindi Sal, Sadhua.

Identifying Features:

- Carapace depressed and median keel prominent.
- Snout pointed, uptured and projecting much beyond lower jaw.
 Upper jaw alightly bicuspid in the adult.
- Limbs have broad, well-webbed digits. Forelimbs have 5 claws.
- Colour olive or brownish above, yellowish below.
- In breeding season males have seven red stripes along the neck.
 The head becomes red on top and bluish on sides.
- A pair of yellow or red oblong markings present on the throat.
- Second vertebral shield has a straight transverse posterior margin.
- Maximum shell length 50 cm. Weight 20-30 kg.

Distribution:

India Chambal National Park (Madhya Pradesh), Gangetic river system Rajasthan, Uttar Pradesh, Bihar, West Bengal. Abroad Nepal, Bangladesh.

Remarks: Species is extremely vulnerable. Entirely aquatic and found mainly in the freshwater bodies having plenty of aquatic vegetation. Large scale exploitation for food and habitat destruction are the two main causes of the declining population.

GANGES SOFT SHELLED TURTLE (FRESHWATER) FAMILY - TRYONICHIDAE

Scientific Name: Trionyx gangeticus [Syn. Aspideretus gangeticus (Cuvier)]

W(P)A Schedule I CITES Appendix I



- Common Name: Bengali Ganga Kachim, Hindi Patal, Kathawah.

 Identifying Features:

 Soft-shelled large turtle. Carapace oval, depressed.
- A slightly down turned snout on a large head.
- Colour dull olive / greenish with black reticulation / yellow spots.
- Head comparatively large, brood, green above with black, oblique stripes on the forehead and sides, which may be broken and in old specimens, entirely lost,
- Limbs have 3 claws. Tail short.
- Orbit nearer temporal than nasal fossa. Post orbital arch narrower than orbit diameter.
- Maximum shell length 70 cm. Plastron ivory white.

Distribution:

India Indus, Ganga, Mahanadi, Narmada and Tapi.

Abroad Irrawady Arakan (Myanmar), Bangladesh, South Nepal and Pakistan.

Remarks:

A large number are caught and sold for food. It has been endangered due to this trade and over-exploitation for eggs. Males are territorial. Adults omnivorous, cannibalistic and scavengers. Feed on other softshelled turtles, fish, frogs, crustaceans and waterfowl. Has been seen feeding on ficus fruit droppings that fall into the water.

RIVER TERRAPIN (FRESHWATER) FAMILY - EMYDIDAE

Scientific Name : Batagur baska (Gray)

W(P)A Schedule I CITES Appendix I



Common Name: Bengali - Porokatha, Borakatha, Sonakatha, Ram Kachim.

Identifying Features:

- Pointed and upturned (tilted) nose tip. Head black / brown, comparatively small.
- Carapace smooth, shining, flat, rounded posteriorly, snowmeated anteriorly, heavy and moderately depressed.
- Four clawed limbs with fully webbed digits
- Colour brown or grey or greenish. Miss part dull purplish.
- Both jaws with denticulate ridge. Upper jaw having notch in the middle.
- Tail extremely short in comparison with body.
- Male assumes brilliant coloration in breeding season i.e. pale blue nostrils, iris turning white from cream, head deep black and neck and front limbs deep crimson to black.
- Moderately large with maximum shell length 155 cm. Weight 18 kg.

Distribution:

India West Bengal (Sunderban), Orissa (Bhitarkanika & Subarnarekha river mouth).

Abroad Bangladesh, Myanmar, Indonesia, Kampuchea, Malaysia, Thailand and possibly Vietnam.

Remarks:

Distinguished from other terrapins by the presence of only 4 instead of 5 claws on the forelimb. The species is now endangered in India. It is reported that in the mid- nineteenth century it was over-exploited in Bengal for its fat which was used to make soap. It is also over-exploited for its eggs. Habitat destruction by way of mining, riverside sand/vegetation removal, bank erosion, urbanization, steamer traffic, damming, etc. are other important reasons for the decline in its population.

INDIAN SOFT SHELLED TURTLE (FRESHWATER) FAMILY - TRYONICHIDAE

Scientific Name: Lissemys punctata punctata (Lacepede) W(P)A Schedule I CITES Appendix II



Common Name: Hindi - Sundri, Gujarati - Pani ka kochbo, Tamil-Pal amai, Bengali - Til kachim, Mate kachim, Oriya - Panka kaincha.

Characteristic skin flaps present on the plastron for hiding him
limbs and tail. Plastron with seven callosities

More or less and decount of the plastron for hiding him

black-bordered yellow spots. Covered with smooth skin.

- Front and back margins of the shell can be bent down to completely hide the retracted head and limbs.
- Head oval with prominent, lateral eyes.
- Short and broad shout with tubular nostrils at the end.
- Digits fully webbed, 3 claws on each foot. Tail short.
- Maximum carapace length about 25cm in males, 35cm in females.

Distribution:

India Indo Gangetic plain and eastwards to Akyab in Myanmar. Abroad Pakistan, Nepal, Bangladesh, Srilanka, Myanmar.

Remarks:

The commonest of the Indian mud turtles, it usually inhabits shallow water. Omnivorous, it feeds on crustaceans(especially shrimps), frogs, fish, snails, water plants, etc. Widely used in the meat market throughout the country. Most commonly seen in the turtle markets of Kolkata, eastern India and Bangladesh. Suspected to be threatened due to over-exploitation for flesh and eggs. Another principal factor is habitat destruction. (especially barrages, dams, etc).

PEACOCK MARKED SOFT SHELLED TURTLE (FRESHWATER) FAMILY - TRYONICHIDAE

Scientific Name : Trionyx hurum

[Syn.- Aspideretes hurum Gray]

W(P)A Schedule I CITES Appendix-I



Common Name: Bengali - Dhum kachim, Assamese Bon kasso.

Identifying Features:

- Head with black/dark green educations and large orange patches behind the eyes. A pale yellow spot across snout.
- Snout strongly down turned and longer than the diameter of the orbit.
- Plastron ivory white/light gray with 5 large callosities.
- Three claws in both fore and hind limbs.
- Bright coloured carapace with prominent eye-like markings.
- Orbit nearer temporal fossa. Postorbital arch narrower than orbit diameter.
- Average size 60 cm.

Distribution:

India In North India, basins of river Ganga, Brahmaputra, Indus and Subarnarekha. Also in Assam, West Bengal and Bihar.

Abroad Nepal, Pakistan and Bangladesh.

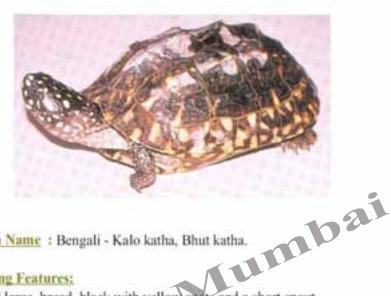
Remarks:

Third commonest species in the commercial food trade in Kolkata. Caught by fishermen using baited hooks, cast and bag nets in Brahmaputra River as well as in U.P. and Bihar for illegal trade to West Bengal. Border trade between Bangladesh and India and from Bangladesh to S. E. Asia reported.

SPOTTED BLACK TERRAPIN / POND TURTLE (FRESHWATER) FAMILY - EMYDIDAE

Scientific Name : Geoclemys hamiltonii (Gray)

W(P)A Schedule I CITES Appendix-1



Common Name: Bengali - Kalo katha, Bhut katha.

Identifying Features:

- Head large, broad, black with yellow spots and a short snout.
- Numerous white spots present on a grey neck and limbs.
- Carapace convex, clorented with 3 well-defined but interrupted keels. black with dail yellow blotches and wedge-shaped marks.
- Plastron almost equal in length to carapace, deeply notched at the back.
- Pale yellow plastron with dark markings.
- Digits well-webbed with transversely enlarged scales.
- Maximum shell length 35 cm.

Distribution:

India North West, North and North Eastern India.

Abroad Pakistan

Remarks:

Carnivorous, but also feeds on fruits. Said to feed on snails in nature. Inhabits ponds, marshes and rivers (Brahmaputra, Ganges and Indus), Extremely vulnerable. Like other turtles it is also under threat because of over exploitation and habitat destruction (barrages, sand mining, etc.).

GREEN SEA TURTLE (MARINE) FAMILY- CHELONIIDAE

Scientific Name : Chelonia mydas (Boulenger)

W(P)A Schedule 1 CITES Appendix 1



Common Name: Hindi - Dudh Kachua, Andamanese - Yadida Gujarati - Duryani kachbi, Malayalam - Kadalama,

Identifying Features:

- Carapace has 4 costal shields on each side, 5 central shields and 25 marginal shields which on not overlap.
- Body smooth, flan stream and heart-shaped.
- Limbs yellow with large dark patch and normally with a single claw each.
- Head bears a single pair of prefrontal shields. Jaws not hooked.
- Campace size 70-153 cm. Green, buff, brown or black.

Distribution:

India Mainly Gujarat coast, Lakshadweep and Andaman & Nicobar Islands, Tamil Nadu, Orissa, Andhra Pradesh.

Abroad Pakistan, Srilanka, South East Asia, African Coast and Australia.

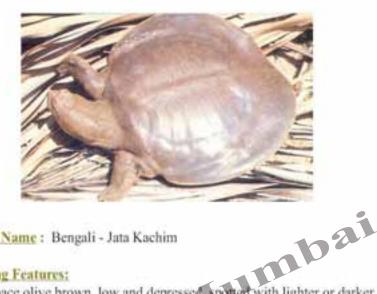
Remarks:

These are migratory in nature. Heavily exploited till recently for fat, cartilage (used for soups)and meat. Fishermen in Tuticorin and Lodhis in Gujarat Coast eat eggs or meat. Like the hawksbill turtles these are also killed for shells which are useful in making spectacle frames, boxes of cigarettes etc. Sometimes the entire shell is used as sounding boards for traditional music instruments. They mainly feed on sea grasses and algae.

ASIAN GIANT SOFT-SHELLED/AUDITHIA TURTLE (MARINE) FAMILY-TRYONICHIDAE

W(P)A Schedule I CITES Not listed

Scientific Name: Pelochelys hibroni (Gray)



Common Name: Bengali - Jata Kachim

Identifying Features:

- Carapace olive brown, low and depressed, sported with lighter or darker shades. Head small, broad.
- Head, outer surface of limbs and neck olive, plastron cream.
- Jaws white with darker sparkings.
- Snout short, that and rounded.
- Orbit nearer easal than temporal fossa. Postorbital arch slightly broader than orbit diameter.
- Total length 101 cm or more.

Distribution:

India Estuaries along coast-Hooghly (Calcutta), Orissa, Kerala, Tamil Nadu. Abroad Malay Peninsula, Indo-China, South-China, Bangladesh, Cambodia, Myanmar, Papua New Guinea, Philippines, Thailand, Vietnam,

Remarks:

It is a near threatened or low risk animal according to the IUCN Red List. It is threatened over much of its range due to direct exploitation for flesh and eggs. Habitat loss is also a main reason. It is found for sale in all markets of coastal areas of Bangladesh. In Indonesia it is traded at low but steady volumes.

HAWKSBILL TURTLE (MARINE) FAMILY-CHELONIDAE

Scientific Name: Eretmochelys imbricata Linnaeus W(P)A Schedule I
CITES Appendix I



Common Name: Hindi - Kangha kachua, Tamil - Seep amai, Gujarati - Daryani Moti kachab, Nicobarese - Kap sah.

Identifying Features:

- Strongly overlapping shields of carapace. Overlap decreases with age.
- Head shows distinct symmetric scales and two prefrontal shields,
- Small, narrow head with strongly looked jaws and strong horny beak.
- Limbs long, having 2 clave.
- Carapace length 90 cm. Narrow, strongly serrated behind, amber/greenish with purple-black markings and yellow mottlings.

Distribution:

India Lakshadweep, Tamil Nadu, Andaman Islands, Orissa, West Bengal, Andhra Pradesh and Maharashtra.

Abroad Circumtropical in coastal reefs, bays, estuaries and lagoons in tropics and subtropics.

Remarks:

In Andaman and Nicobars small scale industries of hawksbill turtles are found and in Kerala its articrafts are designed. Omnivorous. Feeds on sponges, coelenterates, bryozoans etc. The translucent horny shields (keratin layer) of these turtles are known as tortoiseshell, characterized by yellow marbling on a rich dark brown background. Spectacle frame, cigarette or tobacco boxes, earrings, bangles and pieces of art are often made of tortoise shell. The whole carapace is also stuffed and sold as souvenirs. Listed as endangered in IUCN Red List because of over-exploitation by trade.

LEATHERY / LEATHER BACK SEA TURTLE (MARINE) FAMILY- DERMOCHELYIDAE

Scientific Name: Dermochelys corlacea (Linnaeus) CITES Appendix I

W(P)A Schedule I





WIND 21 Common Name: Andaman - Sher kachhua, Car Nicobar - Kap chygot, Central Nicobar - Kap Heebu.

Identifying Features:

- Body triangular in shape.
- Flesh and skin are extremely oily.
- When young body and limbs covered with polygonal well marked shields/keels but in adults the carapace is smooth skinned and composed of 7 strong, nodelar and longitudinal ridges.
- Plastron composed of five longitudinal ridges.
- Slaty black carapace with white spots.
- Front limbs are modified into very large flippers and the smaller find limbs are paddle like. Limbs are clawless.
- Carapace length 140-200 cm, weight 295-600 kg.

Distribution:

India Widely distributed in tropical seas. Kerala, Andaman & Nicobars, Orissa, West Bengal, Tamil Nadu.

Abroad Atlantic, Pacific ocean.

Remarks:

Largest among the chelonian species. They are more oceanic than other species of marine turtles. It feeds on cold water jellyfishes (Cvanea capillata, Rhizostoma cuvieri etc.), small crabs and fishes. Poaching, mainly for eggs but also for shell, etc. Egg-laying period is the most vulnerable for this species since they come to the shore for the purpose. It is a good swimmer and has been known to travel in the open sea. It is one of the two turtles that are toxic to human beings. Among the marine turtles it is one of the most threatened by trade.

LOGGER HEAD TURTLE (MARINE) FAMILY- CHELONIDAE

Scientific Name: Caretta caretta (Linnaeus)

W(P)A Schedule I CITES Appendix I



Common Name: Tortuga Boba, Cayuma, etc.

Identifying Features:

- Head very large hence the name logger head turtle.
- Beak is prominent and the eyes are large brown.
- Carapace elongated, more or less serrated pusteriorly, reddish-brown.
- Two claws are present in each flipper.
- Plastron yellow with orange spots.
- Length 100 cm, weight 50 kg (adult).

Distribution:

India Tropical Regions of India. Mostly uncommon except Andaman

Asoad Temperate and Subtropical Oceans of the World. South Carolina, Albania, Australia, China, Indonesia, Italy, Madagascar, South Africa, Sri Lanka, USA.

Remarks:

World's largest hard shell turtle. Cosmopolitan species found mostly in warm waters. Omnivorous, diet includes fish, crustaceans, zooplankton, molluses, cnidarians, sea grasses, algae, etc. These are killed for skins, shells and meat. Worldwide population is declining. Artificial light on coasts causing disorientation of nesting females is also a threat. This species is considered to be "endangered" by IUCN in their red list. People are fond of their meat and eggs which are used to make turtle burger, turtle soup, etc. This species also provides oxidizing oil which acts like varnish. Pollution from tar, chemicals, mineral oil, etc. also causes death.

OLIVE BACK LOGGER HEAD TURTLE/OLIVE RIDLEY TURTLE (MARINE) FAMILY- CHELONHDAE

W(P)A Schedule I

Scientific Name: Lepidochelys olivacea (Eschscholtz) CITES Appendix 1



Common Name: Hindi - Gadha kachua, Tamil - Pul amai, Bengali - Samudrik katha, Telegu - Samudrum thabelu.

Identifying Features:

- Head large, triangular with symmetrical shields and 2 pairs of prefrontal shields. Top of head grey-brown.
- The orbits are large. Upper jaw hooked.
- Plastron with 4 pairs of intramarginal shreids, each with distinct pores.
- Plastron creamy white and flipper edges vellow brown.
- Each flipper with one claw.
- In comparison to the body the tail is quite short.
- Carapace arched, of we green/grey/rusty coloured, posteriorly serrated with juxtaposed shields, length 46.5 -75 cm, weight approximately 40-55 kg.

Distribution:

India Andaman & Nicobar Islands, entire east coast of India, Maharashtra, Karnataka, Goa, Gujarat, Kerala and Lakshadweep.

Abroad African Coast, Southern U.S.A., Northern Coast of South America, North Australian coast and South East Asia, Pakistan.

Remarks:

Traditional fishermen captured these by using trawler and fishing nets. Incidental catches are still a threat. Tuticorin in Tamil Nadu, Vizag in Andhra Pradesh and Puri in Orissa as well as Kolkata and Digha in West Bengal are known market places for this species. Maximum consumption has been in Japan and Europe. It is listed as Endangered in the IUCN Red List because of its commercial exploitation by man for flesh, skin, leather and eggs. It is most vulnerable during the breeding season. Olive Ridley Turtles feed on invertebrates and may play important roles in both open ocean and coastal ecosystem.

FAMILIES OF TURTLES AND TORTOISES LISTED UNDER SCHEDULE IV OF W(P)A, 1972

FAMILY TESTUDINIDAE

Scientific Name: Geochelone, Testudo species, etc.

Common Name : All Land Tortoises.

Identifying Characters:

- Head and neck completely retractile within the solid shell.
- Carapace dome shaped and covered with homy epidermal shields showing distinct growth rings.
- Marginal shields of campace connected to plastron by a broad bridge.
- Nuchal plate without well developed costiform process.
- Digits short and unwebbed, with not more than two phalanges.
- Hind feet are club shaped. Head shielded above.
- Scent glands are absent in all the testudines.

Remarks: This family comprises true land tortoices, which are heavy shelled, terrestrial herbivorous. There is bigh demand for the star tortoises (Geochelone elegans) in the pertrade Live tortoises are carried on the person or in baggage, with fruits (vegetables / fish are misdeclared as fish / crabs / souvenirs, etc.

this ific \me: Lissemys, Chitra, Dogania, Trionyx species, etc.

Common Name ; The Freshwater Turtles, Mud Turtles

Identifying Characters:

- Head and neck completely retractible. Neck exceedingly long and flexible, ear hidden.
- Jaws are sharp, hidden under fleshy lips.
- Snout ends in a proboscis and much elongated.
- Carapace and plastron covered by a continuous layer of soft skin, without epidermal shields.
- Plastron united to carapace by a ligamentous tissue.
- Marginal bones of the carapace are missing or form an incomplete series, also not attached to the ribs.
- Limbs are fully webbed, paddle-like, 3 claws in each foot.
- Phalanges elongate, 4th digit with 4 or more phalanges.
- Flatterend, soft-shelled, aquatic carnivores.





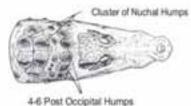
Chitra indica

MARSH CROCODILE FAMILY-CROCODYLIDAE

Scientific Name: Crocodylus palustris Lesson

W(P)A Schedule I CITES Appendix I





Common Name: Hindi, Marathi, Gujarati - Mugger, Oriya - Kuji Kumbhira, Bengali - Kumir, Tamil - Mudalai, Telegu - Mosali.

Identifying Features:

- Dorsally dark greyish olive with blackish speckles, ventrally white or yellowish white. Nostril & oblique slit a little nearer the tip of the snout than the orbit.
- Snout broad and lacking distinct ridges infront of the eyes (his greenish.)
- Just behind head, a row of 4, distinct, sharply raised calles called post occipitals distinguishing it from C. borosus.
- There are 16/17 transverse and 6 longitudinal series of scutes present dorsally and the ventral portion lacks scutes.
- Tail with two series of flattened, vertical scales merging and continued as a simple low till the tip.
- Toes webben
- Length upto 6 m, usually about 4 m.

Distribution:

India Throughout.

Abroad Bangladesh, Myanmar, Pakistan, Nepal, Bhutan and Sri Lanka.

Remarks:

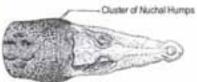
Adults eat larger fish, amphibians, reptiles (mainly snails and possibly turtles), birds and mammals. Locally killed for food and fat. Eggs collected for food. Centres for illegal skin trade are Madras, Mysore, Calcutta and Kanpur. It was threatened in the past by unregulated hunting for skins. But now this species is threatened due to habitat destruction, egg collection and illegal hunting. The skin is mostly used in making ladies' bags, hunting shoes and as mounted trophy. The meat, fat and eggs are used in some Ayurvedic and Unani medicines.

ESTUARINE OR SALTWATER CROCODILE FAMILY- CROCODYLIDAE

Scientific Name: Crocodylus porosus (Schneider)

W(P)A Schedule I CITES Appendix I





Post Occipital Humps Absent.

Common Name: Oriya - Baula Kumbhira, Rest same as for Crocodylus Probably the most largest, strongly built reptiles.

The snout is longer than in C. palutin.

6 - 8 longitudinal. palustris.

Identifying Features:

- 6 8 longitudinal series of scures present dorsally.
- A strong ridge in front of the eye, nearly half of the length of the snout.
- Post occipital scales indistinct.
- Adult crocodiles dark olive in colour interspersed with yellow.
- Length upto 10 m, usually about 5.5 m.

Distribution:

India Orissa, West Bengal, Andaman and Nicobars.

Abroad Bangladesh, Myanmar, south eastern China, Hong Kong, Indonesia, Kampuchea, Malaysia, Philippines, Singapore, Sri Lanka, Thailand, Vietnam, North Australia, Papua New Guinea, Fiji.

Remarks:

Inhabits brackish water. It feeds mainly on sharks, archer fish, barramundi, mullet, mudskippers, mangrove snakes etc. Its flesh traded for food and fat for medicine. The species became seriously endangered but threats from habitat destruction especially breeding sites still exist. Illegal trading is being stopped nowadays but killing due to fear is becoming an increasing problem. Hide is used in making shoes, bags, purses, etc.

GHARIAL FAMILY- GAVIALIDAE

Scientific Name: Gavialis gangeticus (Gmelin)

W(P)A Schedule I CITES Appendix I



Common Name: Hindi - Gharial, Bengali - Mechho Kumhir, Oriya - Thantia Kumhira, Bihari - Nakar, Bahsoolia Nakar.

Identifying Features:

- Long, narrow snout ending in a characteristic bulbous tip. Adult male has pronounced pot-like cartilage on snout tip. Hence the name "blurral".
- Body strongly armored with longitudinal and transverse scutes.
- Upper surface in adults almost grayish black, lower surface uniformly light without dark blotches.
- 27-29 undifferentiated teeth in the upper jaw, 25-26 in the lower jaw.
- First three teeth of the lower jaw fit into notches on the upper jaw.
- Length upto 7.2 m, usually about 4.5 m.

Distribution:

India Indus, Ganges, Bramhmaputra and Mahanadi river systems.

Abroad Irrawady Arakan (Myanmar), Bangladesh, South Nepal and Pakistan.

Remarks:

Oldest of the living crocodilians. Eats fish mainly. Sometimes it feeds on birds, dogs and other vertebrates also. The species is now rare and endangered. Its flesh is traded as food and fat as medicine. Skin mostly used in making shoes, bags, purses, etc. Overuse of river ecosystems by human population has also contributed to its downfall.

AGRA MONITOR LIZARD FAMILY-VARANIDAE

Scientific Name: Varanus griseus (Daudin)

W(P)A Schedule I CITES Appendix 1



Common Name: Trade - Baghdad small grain, Hindi - Gho.

Identifying Features:

- Nostrils oblique, 4 times further from muzzle.
- ,bai Whip like rounded tail distinguishes it from other monitor lizards.
- Dorsally pale greyish yellow with small spots. Yellowish ventrally,
- 2-3 longitudinal, distinct, brown cross bars on the back and tail.
- Moderately elongated digits are present.
- Maxillary teeth 27-29, mandibular teeth 25-26.
- Crown scales are usually larger than nuchal scales.
- Small and granular scales, caudal scales indistinctly keeled.
- Mid body scales in 110-125 rows.
- Total length: 1-3 m (appx)

Distribution:

India Rajasthan, Delhi, Uttar Pradesh, Haryana, Madhya Pradesh, Maharashtra. Abroad Egypt, Sudan, Syria, Lebanon, Israel, Jordan, Iraq, Saudi Arabia, Pakistan, Iran, Afghanistan, Russia.

Remarks:

Normally found in the rivers and deep pools. Hunted extensively for valuable skin, meat and fat. Lives in burrows in undulating sandy grounds. Chiefly feeds upon insects (locusts, grasshoppers, crickets), other lizards, snakes, birds, small rodents and eggs. Skin is very much used in making wallets, watch strap, bags, belts and footwear.

BARRED, OVAL OR YELLOW MONITOR LIZARD

FAMILY- VARANIDAE

W(P)A Schedule I CITES Appendix I

Scientific Name: Varanus flavescens (Hardwick & Gray)





SCALE PATTERN

Common Name: Bengali- Swarna Godhika, Hindi - Gho.

Identifying Features:

- Smallest monitor lizard.
- umbai Convex and short snout, nostrils are oblique slits closer to snout tip than eyes.
- Slightly compressed tail, keeled above.
- Crown scales are smaller than nuchal scales.
- Dorsally yellowish brown. Ventrally yellowish with dark brown crossbars.
- Dorsal scales small and strongly keeled. Abdominal scale count 65-75
- Digits are very short.
- Shows broad red cross bands on dorsal side prominent during monsoon, indistinct at other times.
- Total length 90 cm (appx).

Distribution:

India Haryana, Uttar Pradesh, West Bengal, Bihar, Orissa, Assam. Abroad Bangladesh, Myanmar, Pakistan and Nepal.

Remarks:

It is known as oval grain in semi trades. Feeds mainly on frogs, toads, turtle's egg, lizard egg, frogspawn, mammals, birds and their eggs and a range of invertebrates especially beetles and earthworms. Lives in burrows on muddy bundhs near ponds, lakes and canals. The items related with trade is mainly made up of its skin, like wallets, footwear, bags, straps for wrist watch, belts, dafri (musical instrument) etc.

WATER LIZARD FAMILY-VARANIDAE

Scientific Name: Varanus salvator (Laurenti)

W(P)A Schedule I CITES Appendix - U.





SCALE PATTERN

Common Name: Trade - Ring lizard, Bengali - Ram Godhika.

Identifying Features:

- Dorsally blackish with yellow spots, this pattern fades with age.

 Ventrally yellow, abdominal scales forbly bested.
- Ventrally yellow, abdominal scales feebly keeled
- Nostril oval, at least twice as far from orbit as from the muzzle.
- Eyes having eyelid and with round pupils.
- Sharp, long and recurved teeth present.
- Long protrusible tongue present
- A black temporal streak bordered by a yellow band.
- Head scales moderate size.

Distribution:

India Orissa, West Bengal, Andaman & Nicobars, Meghalaya, Nagaland and Mizoram.

Abroad Bangladesh, Bhutan, Myanmar, Sri Lanka, Brunei, South China, Hong Kong, Singapore, Thailand and Vietnam, Northern Australia.

Remarks:

Traded for meat and fat. It is the most aquatic monitor species in India. Second largest of all the monitors in the World. Found in fresh as well as in salt waters. Feeds on crustaceans and molluses. It is fond of eggs and can destroy the poultry farms. Also feeds upon tortoises, baby crocodiles and snakes.

COMMON INDIAN/LARGE BENGAL MONITOR LIZARD FAMILY- VARANIDAE

Scientific Name: Varanus bengalensis (Linnaeus)

W(P)A Schedule I CITES Appendix - 1





SCALE PATTERN

Common Name: Hindi - Gho, Bengali Krishna - Godhika, Gho sap, Gujarati - Patla Gho, Oriya - Godhi, Marathi - Ghorpad.

Identifying Features:

- Nostrils are oblique slits a little nearer to the orbit than the muzzle.
- Scales on the crown of the head larger/than the scales of neck.
- Dorsally yellowish, brownish or ofive with many black spots, a distinct dark temporal streak. Ventrally yellowish, uniform or dotted with black.
- Caudal scales keeled
- Long, forked and protrusible tongue.
- kong, harp, acute and recurved teeth.
- Abdominal scale count 90-110.
- Small, sleek, diurnal monitor lizard. Total length 1.7 m (approx.).

Distribution:

India Throughout India.

Abroad Afghanistan, Pakistan, Iran, Nepal, Bangladesh, Myanmar, Srilanka, Indonesia, Laos, Malaysia, Thailand, Vietnam.

Remarks:

The skin is used for making musical drums (dafri). Finished leather is used in making footwear, wallets, bags, straps etc. Some tribals also eat it. Lives usually in burrows, crevices. Good swimmer. Often steals eggs from bird nests by destroying it. Also feeds on small terrestrial vertebrates, arthropods and fishes.

GOLDEN GECKO FAMILY-GEKKONIDAE

W(P)A Schedule I

Scientific Name: Caloductyloides aureus (Beddome) CITES Not listed



Common Name: Golden gecko.

Identifying Features:

- A pair of internasal, upper and lower labrals 12-13.
- Finger and toes are dilated and sevoid of any cutaneous appendage.
- Ear opening is an oblique slit.
- Dorsal scales assiformly granular, belly scales are small, squarish and juxtinosed.
- Two plate like expansions on the terminal phalange of the slender digits.
 - Eyes large with vertical pupil.
- Colour brilliant golden yellow, brownish black.
- Size 185 mm (head + body =85 mm and tail 100 mm)

Distribution:

India Rocky ravines in Eastern Ghats up to Vizag Ghats, Western Ghats of Karnataka and south Arcot District (Tamil Nadu).

Remarks:

Largely insectivorous. Endemic to India. Large monotypic gecko. Due to habitat destruction it is becoming an Endangered species now. No skin trade is recorded.

INDIAN CHAMAELEON FAMILY-CHAMAELEONIDAE

W(P)A Schedule II(part II)

Scientific Name: Chamaeleon zeylanicus Laurenti CITES Appendix II





Common Name: Hindi - Girgit, Bengali - Bahuroop, Tamil - PachchaiOhnan, Gujarati - Sarado.

Identifying Features:

- Head and body compressed laterally. Body scales covered with granules or tubercles. granules or tubercles.
- On the top of the head a helmet like conical casque seen.
- Highly extensile tongue with club shaped tip.
- Tail fully prehensile. Digits in two opposed sets two outward, three inward in forelimb and three outward, two inward in hindlimb.
- Eyes large and covered by granular, scaled lid leaving out small space for vertical pupil.
- Lower portion basically green, with yellow/black spots.

Distribution:

India Throughout. Abroad Pakistan.

Remarks:

Arboreal in nature. It has a rare camouflaging quality, being able to change normal green body colour frequently in response to light, heat, environment, emotion, etc. Prefers wooded and semi desert areas. It is an endangered species.

SPINY TAILED LIZARD OR SANDA FAMILY-AGAMIDAE

W(P)A Schedule II(part II)

Scientific Name: Uromastyx hardwickii Gray CITES Appendix II



Common Name: Punjabi - Salma, Hindi - Sanda, Gujarati - Sandho.

Identifying Features:

- Yellowish brown in colour with dark dots or vermiculations.
 Skin is loose and wrinkled on flattened body.
- Skin is loose and wrinkled on flattened body
- Presence of blackish patch on anterior part of thigh.
- Distinct fold across the throat. Mead small, rounded.
- Limbs very strong.
- > Spiny tail, thick at the base, with cross rows of enlarged spiny scales on the tail. The spiny rows are separated from each other by 4-6 pows of smaller scales.
- Length averaging 415 mm in males 375 mm in females.

Distribution:

India Uttar Pradesh, Rajasthan, Gujarat,

Abroad Pakistan.

Remarks:

Absolutely terrestrial and diurnal in habit. Inhabits sandy places and tends to live in colonies. Easy to eatch and tame. Normally herbivorous but feeds on locusts also. This species is exploited in trade for oil extraction from its fat, which is said to have medicinal value (mostly aphrodisiaes) for which they are boiled alive in oil. They are often starved for some days and their backs are broken to prevent them from escaping.

Snake & Snake Venom

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Reptiles form one of the four classes of land-dwelling animal groups with backbone (the other three: amphibians, birds, mammals). Reptiles evolved from amphibians. Birds and mammals evolved from reptiles. Generally speaking, reptiles differ from amphibians by their dry scaly skin, from birds by absence of feathers and from mammals by absence of fur or hair. The first reptiles evolved 300 to 269 million years ago. All these except the tuatara lizard of New Zealand became extinct. The tuatara is called a 'living fossil'. The present-day reptiles evolved 70 million years ago. There are about 6,000 living species of reptiles, almost double the number of living species of mammals. The four orders of reptiles are (I) Crocodiles (II) Turtles (III) Lizards and (IV) Snakes.

Orders	World	India
Crocodiles	22	3
Turtles	242	32
Lizards	2800	155
Snakes	2750	244

Most reptiles are carnivorous. Snakes are exclusively carnivorous. A few reptiles such as the land turtles (tortoise), the marine green turtle and the green iguana are vegetarians. Crocodiles, lizards and turtles lay eggs which lie buried in the earth for incubation. Most snakes lay eggs. Some snakes (e.g. vipers) give birth to live young.

All egg-laying reptiles lay the eggs on land. Most reptiles (e.g. crocodiles, snakes) replace their teeth throughout life. Turtles and tortoises have no teeth. The brain in reptiles is small. Reptiles have low intelligence and are ruled mainly by instinct. But even in instinct, they are inferior to birds. They eyes of reptiles are well-developed except in the burrowing forms. Reptiles are cold blooded. This does not mean that the blood is cold but that there is no internal mechanism for regulating the temperature as in the case of birds and mammals. The reptile regulates its temperature by choosing its environment. Reptiles produce and use less energy than birds and mammals. They can go without food for long intervals, sometimes for months. For various reasons, reptiles are destroyed ruthlessly.





SNAKES

Snakes evolved from lizards in the late Jurassic age, 135 million (135,000,000) years ago, that is, more than 100 million (100,000,000) years before our human-like ancestors appeared on the earth. There are about 2750 species of snakes in the world. Of this, 244 are found in India. The longest snake in India (and the world) is the reticulated python – maximum length: 840 cm. The longest poisonous snake in India (and the world) is the king cobra – maximum length: 540 cm. The smallest snake in India (and the world) is the common worm snake or common blind snake – maximum length: 17 cm. The Indian egg-eating snake (Bengal, Bihar) is the rarest Indian snake. Most snakes are oviparous, i.e. they lay eggs (e.g. cobra, rat snake, kraits, pythons).

Some are viviparous, i.e. they give birth to live young (e.g. all vipers, green vine snake). Some are ovoviviparous, i.e. the embryo in the egg develops inside the body of the mother and the young are born (e.g. sand boas). The shell of snake eggs is not hard but leathery. The common worm snake or common blind snake is believed to be parthenogenetic, the female reproducing without a male. Only female specimens have been found. Once the eggs are laid, most snakes do not take care of them. The Indian cobra guards the eggs. The king cobra builds a nest of leaves on the ground into which it deposits its eggs and then coils round and incubates them. It is the only snake that builds a nest.

Most snakes hunt prey by sight. Some snakes which hunt at night have heat-sensitive areas on their face (e.g. pythons, pit vipers). They can detect and strike prey in the dark by sensing the warmth given off by the animals. The forked tongue of the snake is not an organ of taste but of smell. It transfers scent particles from the air to an organ inside the mouth (Jacobson's organ) which responds to chemicals and distinguishes smells. Snakes have no external or middle ears and cannot generally hear sound waves in the air. They hear vibration on the ground picked up by the lower jaw and transmitted to the inner ear. Research shows that, in some species of snakes, the lower jaw can also pick up sound waves in the air in the low frequency range of 100 to 700 Hz. or cycles per second. The teeth in snakes are curved backwards so that, once caught, the prey cannot escape. Snakes cannot chew food. They swallow food whole. The skull bones of the snake are loosely connected together. This and the flexibility of the skin make it possible for the snake to swallow animals much bigger than

itself. Snakes have no eyelids. The eye has a transparent cover which changes every time the skin is shed. Snakes shed their skins periodically. Snakes are exclusively carnivorous. They do not eat vegetables. The king cobra mainly eats snakes. The Indian egg-eating snake (Bengal, Bihar) eats only eggs.

SEASNAKES

Present-day sea snakes evolved from land snakes 25 million years ago. Almost all sea snakes are in the warmer waters tropics & subtropics – Indian & Pacific oceans. Some of them live in estuaries. There are 60 species of sea snakes, 20 are found on the Indian coast. The species vary in length: 45 to 180 cm. Sea snakes live in shallow waters. But they can dive down to about 100 m.

Unlike fishes, sea snakes come to the surface to breathe. They remain under water only for about half an hour at a time. The lung is the principal organ of respiration. To a limited extent, they respire through the skin also. The lung of sea snakes also functions as a hydrostatic organ to help it to float or submerge as in the case of the swim-bladder in fish. They mostly eat fish. Eels are a favourite food. Sea snakes detect prey mostly by smell and vibration in water and not so much by sight. Sea snakes have salt glands in the mouth. These absorb excess salt from the body fluids in the form of concentrated salt solution which is ejected from the mouth. Most sea snakes have flattened tails which help movement in water. Except for the laticaudids (sea-kraits-total: 4 species), all sea snakes give birth to live ones. The laticaudids lay eggs. The live-bearing species of sea snakes are the only reptiles that bring forth their young in the sea. The eggbearing sea snakes and the other two sub orders of reptiles (The crocodilians and the turtles) lay their eggs on land.

Most sea snakes are highly venomous. The venom is 4 to 10 times more potent than cobra venom. In one bite, *Enhydrina schistosa* can deliver enough poison to kill 50 humans. But sea snakes generally do not bite humans. They should, however, be handled with care.





SOME FALSE BELIEFS

False Belief	Fact
The cobra sways its hood in response to the snake-charmer's music	The cobra sways its hood in response to the movement of the snake-charmer's pipe.
The cobra and the rat snake are the male and the female of the same species	They belong to different species and mate only with snakes of the same species.
The cobra sometimes carries a jewel on its head.	No such thing.
When a snake is killed, its mate will appear to seek revenge.	A snake may be attracted to the site where another is killed by the scent exuded from the anal glands of the killed snake. It does not come to seek revenge.
Snakes are slimy to the touch.	They have dry skins.
Snakes have a liking for milk.	They do not.
The red sand boa has heads at both ends.	The tail is blunt and is mistaken for a head.
The bite of the common sand boa causes skin disease.	It does not.
The green vine snake strikes at the eye.	This is an exaggeration. If held in front of the face, this snake sometimes does lunge at the face.
The bronzeback tree snake, after it bites and kills a man, will climb a tree to watch the victim's funeral pyre.	It is non-poisonous, does no such thing.

Identification of snakes:

Most laymen make the mistake of trying to identify a snake entirely by colour or patterns on the body. Colour in many species of snakes is variable even though some of the colour form may be predominant. The patterns on the head or the body can also be variable. Added to these is the problem that in some species the

young are different in colour and marking from the adults. The general body configuration and the head shape are important diagnostic features. In any particular species of snakes, the number shape size disposition and nature of scales on the head and the body are fairly constant. In closely related species, when difference in scalation may not be marked, dentitional characters i.e. the arrangement of teeth are important. Some idea of the general colour forms and the predominant patterns on the skin may be rough and ready guide for laymen to avoid gross error. Apart from the appearance the behavior of the snake particularly its threat display the place where it is seen are also helpful in recognizing the snake.



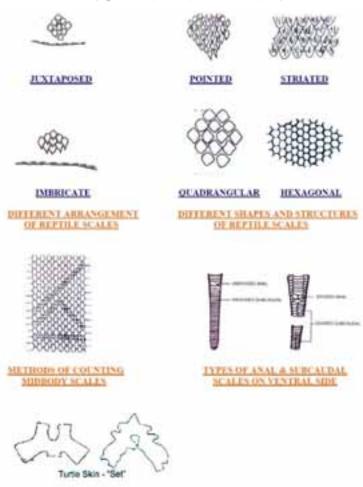








Snakes are probably the most traded reptiles. Ratsnake skins commonly referred to as 'whips' are the most commonly traded. Other species include cobras, saw-scaled vipers, Russel's vipers, pythons, etc. Tanning / processing centers are concentrated in Chennai, Mysore, Agra, Kanpur, Puri, Indore and Pune and collection is by specific tribals like Irulas. Identification calls for a close examination and counting of scales. Dorsal scales (over back and sides) are counted diagonally at mid body as shown in figure while ventrals (large shields/scales over belly) are counted from enlarged scale under the head till cloacal opening. Ventral scales counted may be less than that for the species since often the heads are cut off alongwith a few ventral scales. Shape of scales (e.g. hexagonal, roundish / granular, quadrangular, pointed, etc.) is an important identifying feature as also arrangement (overlapping i.e. 'imbricate' or independent i.e. 'juxtaposed') and surface structure (e.g. smooth, keeled, with tubercle, etc.).



Snake venous is also very precious, mainly obtained in Maharashtra and Tamilnadu. It may be samaggled in person or through parcel, in powder/crystalline form, often in glass tabes and misdeclared as homoeopathic medicine or some chemical, etc. To identify, cobra venous is faint transparent yellow turning turbid in sunlight. Russel's viper venous is white or yellowish and acidic to Litmus paper. When dry it forms fine needle-like crystals that dissolve in water more easily than salt or sugar.

SNAKE-BITE

Most snakes are harmless. Some are deadly venomous, but even they generally bite only when provoked. Of the 244 species of snake s in India, about 52 are venomous — some mildly venomous and some highly venomous. The common species in Indian which are deadly to man are only 4: The Indian cobra, the Russell's viper, the saw-scaled viper and the common Indian krait. The most dangerous snake in the world is the taipan of Australia.

The venom gland is a modified salivary gland. The snake has its venom for killing or paralyzing its prey. The venom also helps in its digestion. Snake venom is a rich source of important enzymes which are valuable in medical research. Snake venom has different characteristics. Cobra and krait venom paralyse the nervous system and the respiratory centre. Viper venom paralyses the heart tissue. Snake venom also prevents clotting of blood and destroys red blood cells. Not all bites by poisonous snakes are necessarily fatal. It depends on the condition of the snake, the quantity of venom delivered etc. Snake venom acts when it gets into the blood stream. It can be safely swallowed if there is no injury in the mouth or the digestive system. But if swallowed in large quantities it may get absorbed into the blood stream in which case it is dangerous. Antivenin or antivenom serum, a drug prepared using snake venom, is the only reliable treatment for snake venom, is the only reliable treatment for snake bite. Chanting of incantations, use of 'snake stones' etc. have no effect except to give confidence to the patient. Giving the patient confidence and keeping him calm is, however, important since, in many cases, the death is not from the poison but from shock. There is as yet no scientific proof for the claim that some herbs are effective against snake poison. But this calls for further research.





FIRSTAID IN SNAKE-BITE CASES

- 1. See that the patient does not get excited or exert himself.
- 2. Tie a piece of cloth above the bite site. Tighten it to restrict but not totally prevent blood flow. (You should be able to insert one finger under the band). Take the patient immediately to the nearest hospital where antivenin is available.



Extraction of Snake Venom for preparation of Anti-Venin



ALGORITHM FOR A ROUGH IDENTIFICATION OF THE MAJOR KINDS OF (3) Snokins other than in (1) or (2): VENOMOUS AND NON - VENOMOUS SNAKES OF INDIA Should pildess covering the antitre width of the belly: Venomocs or Non-ve Shields on the hard. Cylindrical tail ii.e. not comp Belly scales not extendin fully across the belly Send scales on the head Flat blangular head. No pits on the hear Pillers vipora chi SMAKES apots on the belly No hood . Cord cales or shelds on the head Two pits on the head. between nose and eyes (f) Scales on the back are until 3rd Upper-tip schield touchs the eye and note-chield Sebcaredals, undivided. Cobras & Coral snak Cobess & Ning col Patholica



THE RETICULATED PYTHON (Non Poisonous) FAMILY - BOIDAE

Scientific Name: Python reticulatus (Schneider)

W(P)A Schedule I CITES Appendix II





Common Name: Reticulated python.

Identifying Features:

- Appears similar to the rock python except that the body colour is a mixture of yellow brown and black on the dorsal side.
- On dorsal side a series of large dark brown, circular, oval or rhomboidal spots present.
- Each spot edged with black and outside again with yellow,
- Whitish or yellowish below.
- Dorsal body scales are smooth and are in 70-80 rows. Scale count-ventrals are 297-332, subcaudals 75-102. Anal shield undivided.
 Attains length of upto 10 m.

Distribution:

India North Eastern side, Nicobar Islands. Abroad Burma to South Eastern Asia.

Remarks:

Largest and heaviest of all Indian snakes. Feeds mostly on fowls, ducks, cats, dogs, pigs, etc. Occasionally eats wild boar, deer also. Found mainly in wet evergreen forests. Semi aquatic in nature. Most threatened and endangered/vulnerable species. Meat is said to tastes like that of deer costs \$ 20.00 per kilo. Skin is being used in making articles like shoes, wallets, bags, patches on leather jackets, skirts, pants etc. It has a demand in the pet trade too as well as with snake charmers. Both live specimens, skins or products are traded.

INDIAN ROCK PYTHON (Non Poisonous) FAMILY - BOIDAE

Scientific Name: Python molurus (Linnaeus)

W(P)A Schedule I CITES Appendix-1





SCALE PATTERN

Common Name: Hindi - Azgar, Malaylam - Malam Pambu, Tamil - Periya Pambu, Telegu - Pedda Poda.

Identifying Features:

- A heavy bodied smooth scaled snake with bright yellow or dark brown blotched pattern. This helps in identification even in finished products made from its skin.
- Spurs, which are vestigial legs seen on either side of the anal vent.
- Small slits near the nostrils.
- Eyes moderate, with a vertically elliptic pupil.
- Body rounded in outline and thickest in the middle, tapering towards head and anus.
- Head lance shaped and flattened with a spear shaped mark.
- Dorsally dark brown and ventrally dirty whitish or yellow.
- Scale count: neck-60-75; body 60-75; ventral-245-270; caudal-58-73.
- Average length: 3 m-6 m. Maximum weight recorded 91 kg.

Distribution:

India Throughout most of India (estuary, mangrove forest, arid jungle, cool dense rain forest, marshes, rocky ledges).

Abroad Pakistan, Nepal, Myanmar, Bhutan, Sri Lanka, Thailand and Malaysia.

Remarks:

The second largest of the Indian snakes. It is present in trade mainly for its skin. Skin is mainly used in making long-shoes, bags, purses, belts, garments, etc. It was also reported that between 1977 to 1983 nearly 50000 live Indian pythons were imported by USA alone. In Southern India, its meat is consumed by tribals and the fat favoured for purported medical uses. They are easily smuggled out with consignments of leather, garments, shoes, other fashion accessories etc. Being rare it is a sought after skin in trade. Live snakes are in great demand for the pet trade and smuggled hidden in clothing, on the person or in passengers' hand or cabin baggage.

DOG FACED WATER SNAKE (Non Poisonous) FAMILY - COLUBRIDAE

W(P)A Schedule II(part II)

Scientific Name: Cerberus rhynchops (Schneider) CITES Appendix III



Common Name: Dog faced water snake, Pani ka saanp.

Identifying Features:

- Frontals partially and parietals entirely broken up.

 Distinguished from other water snakes has the special supralabials and 23.27 Distinguished from other water snakes by the presence of 2 internasals, and strongly keeled, lateral seales are slightly larger than median dorsal. Ventral shields 122-159, subgradal shields 50-68. Anal shield is divided.
- A rather stout, rough skinned snake with pear shaped head, broad at the occiont.
- Shout narrow in profile with prominent lower jaw, eyes small, papils vertical.
- Dorsally grayish, brownish or olivacious with dark spots or cross bars.
- Belly coarsely spotted or dappled with greenish black.
- A conspicuous postocular streak running to the sides of forebody.
- Length 850 mm(Avg) in males and 1180 mm (Avg) in females.

Distribution:

India Coastal India including Andaman & Nicobar Islands. Abroad Bangladesh.

Remarks:

A fairly common estuarine species found in the littoral zones of sea, muddy and rocky areas i.e. mangrove swamps, salt pans and creeks. Good climber. Feeds on several piscine species namely Tilapia sp. and Clarias sp. (Cat fish). Excellent and agile swimmer and possesses a curious "side water" movement on land. Affected by loss of coastal habitat and pollution of brackish waterways. Skins are used in making wallets, bags, straps, etc.

CHECKERED KEELBACK (Non Poisonous) FAMILY - COLUBRIDAE

W(P)A Schedule II(part II)

Scientific Name: Xenochrophis piscator (Schneider) CITES Appendix-III





SCALE PATTERN

Common Name: Hindi - Pani ka sap, Dhoria, Gujarati - Dendu, Bengali - Jal Dhora, Tamil - Thaneer Pambu.

Identifying Features:

- 2 (4^a and 5^a) supralabials (upper lip scales) touching eye.
 Has 2 internasals, 1 preocular and 9 supralabials.
- Fairly robust snake with oval head, slit like nostrils and moderately large upwardly faced eyes.
- > Tail one-third to one-fourth of total length.
- Anal shield undivided.
- Generally olive, yellow or brown above and white or yellow below.
- Scales round the body strongly keeled and devoid of apical pit. Ventrals more or less rounded, subcaudals paired. Scale count: neck - 19, body - 19, ventral 140-154, caudal 63-76.
- Longest measured 1.48 m. Usually 99-121cm.

Distribution:

India Areas throughout India.

Abroad Nepal, Bhutan, Pakistan, Bangladesh, Sri Lanka.

Remarks:

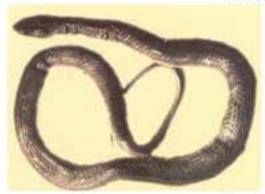
One of the commonest freshwater snakes of India. A curious behaviour of this snake is the habit of shamming death when attacked by a predator like mongoose. The secretion of the large parotid glands is fatal to small mammals, birds, lizards and frogs in laboratory experiments, but has no effect on man and larger mammals. They generally swallow their prey alive. It can hold and puncture the frogs by its long "Frog Teeth". Generally a snake of the plains but found in the hills upto 2100 m. Found also in paddy fields, pools and rivers. Its skins are prominent items in skin industry. Used in making wallets, ladies bags, straps, belts, sandals, chappals, etc.





OLIVACEOUS KEELBACK (Non Poisonous) FAMILY - COLUBRIDAE

Scientific Name: Atretium schistosum (Daudin) W(P)A Schedule II(part II)
CITES Appendix- III



Common Name: Telegu - Nalla Wahallagillepam, Kannada - Barmmya.

Identifying Features:

- Single internasal, 19 costals at midbody and 8 or 9 supralabials.
 Prefrontals divided. Loreal subquadrangular.
- Small slit like nostrils placed rather high as in water snakes.
- Uniform deep olive-green above and uniform yellow below.
- Body rough due to keeled scales.
- Upper lip yellow or pinkish.
- Scales keeled and lacking apical pits. Ventrals rounded and subcaudals pitted. Scale count: on ventral 129-160, caudal 53-85, anals 2.
- Length averaging 73 cm in females, 55 cm in males.

Distribution:

India Peninsular India south of 15°N latitude and along east coast. Uttar Pradesh, Karanataka, Tamil Nadu, Andhra Pradesh (from sea level upto 1000 m). Abroad Sri Lanka.

Remarks:

Lives either in water or among the surrounding vegetation. Largely diurnal and feeds mainly on frogs, fish and crabs. It also takes mosquito larvae as food. Usually buries itself in loose soil or mud near pools or lagoons. Inoffensive but when alarmed flattens the fore part of the body. It is called as "water cobra" and it is a well camouflaged snake.

DHAMAN OR COMMON RATSNAKE (Non Poisonous) FAMILY- COLUBRIDAE

Scientific Name: Pryas mucosus (Linnaeus)

W(P)A Schedule II(part II) CITES Appendis- II





SCALE PATTERN

Common Name: Hindi, Bangla, Marathi - Dhaman, Tamil - Sarai Pambu, Assamese - Machoa Gom.

Identifying Features:

- Head rather elongate. Top of the head is without any spot.
- Eves large and lustrous.
- Nostrils large, occupying the whole depth of the suture between nasals.
- Neck distinctly constricted.
- Body robust, feebly keeled, compressed, tapering towards both ends.
- Tail cylindrical about one fourth of total length.
- Dorsally olivaceous brown, belly grayish white.
- Scales overlapping, glossy with a pair of apical pits. Scales of the anterior portion of the body are smooth, some with yellow or light tam edges. Posterodorsal scales feebly keeled. Many posterior scales have black tip and feebly keeled,
- Scale count: neck 17-19, body 16-17, ventral 190-213, caudal 100-146. Rhomboid / squarish scales in their skin products quite distinct and helps in identification.
- Ranges 1.65 to 2 m. Males are longer than females.

Distribution:

India Throughout India including Andaman & Nicobar Islands
Abroad Sri Lanka, Myanmar, Afghanistan and Turkistan, China, Java & Sumatra.

Remarks:

Possesses a rare quality to adapt to any environment. Basically a plain dweller, but recorded upto 1,800 m. Diurnal. It is eaten in some parts of Malabar in Kerala. The cooked flesh is served as "Parambu wala" or "Kara wala." Often referred to as Whip snake, it is the most commonly exploited snake in trade. Maximum use of skin is in leather industries where the skin is used in making wallets, bags, belts, briefcases, boots etc. Decline in the population of rat snakes is causing serious grain storage problems because it is a good pest controller. Their impressive length also makes them a favourite with snake charmers next only to cobras.

INDIAN EGG EATING SNAKE (Non Poisonous) FAMILY-COLUBRIDAE

Scientific Name: Elachistodon westermanni

Reinhardt

W(P)A Schedule I(part I) CITES Appendix II



- A small, ofive brown to black snake. Lips yellow.

 Vertebral scales yellowish white, forming a transfer of the scales yellow.

 A yellow A yellow stripe along the top of the head from snout to angle of mouth.
- Lacking clear deparcation between the head and the neck.
- Scales smooth, in 15 rows at mid-body, 19 rows on neck.
- Sease count : ventrals 208-217, subcaudals 59-65, anal single.
- Length 80 cm (Approx). Tail length 13 cm.

Distribution:

India North Bengal, Bihar, Northwest U.P. (Corbett National Park) Abroad Nepal (Chitwan Dist.). Bangladesh.

Remarks:

Occurs mostly in moist deciduous tropical forests. Non-aggressive in nature. Closely resembles the African egg eating snake. The throat vertebrae are typically enlarged like that of African egg eating snake because it helps in breaking the shells of eggs after it has been swallowed. A rare snake in nature.

RUSSELL'S VIPER (Poisonous) FAMILY-VIPERIDAE

Scientific Name: Vipera russelli (Shaw)

W(P)A Schedule II(partII) CITES Appendix-III





Common Name: Bengali - Bora, Chandrabora, Hindi - Daboia, Gujarati - Chitalo, Marathi - Ghonas, Tamil - Retha Aunali.

Identifying Features:

- Flat, triangular head covered with small irregularly arranged scales and without shields. 27-33 costals at mid body. Subcaudals divided.
- Large eyes with vertical pupil. Large open crescent shaped nostrils.
- Snout short and bluntly pointed. Lips white or pink.
- Ground colour brown of varying shades with 3 series of large ovate spots, one vertebral and two costal, spots brown in the centre and margined successively by black and white or buff.
- Belly rounded white or yellowish, with a few dark half-moon marks on the margins of the anterior ventral.
- Dorsal scales keeled but not serrated. Scale count. Neck. 27-33, Body. 21-23, Ventral. 153-180, Caudal. 41-64.
- Length 120 cm (Approx.).

Distribution:

India Indian sub continent.

Abroad Baluchistan, Myanmar, Thailand, Indo-China, Formosa, Indo-Australian Archipelago and Sri Lanka.

Remarks:

Strikes only when being irritated. Viviparous in nature. Found both in plains and hills. It frequents bushy areas, grasslands, farmland, cultivated fields and rocky piles. Young are often cannibalistic. Main food is murid rodents. Also eats mice, squirrels, shrews, Kittens, small birds, lizards and frogs. When becomes annoyed emits a loud his to indicate it. Different items made of skins are also found in the market. The venom is useful in making medicine.

INDIAN COBRAS (Poisonous) FAMILY-ELAPIDAE

W(P)A Schedule II(part II)

CITES Appendix- II

Scientific Name: Naja naja naja (Linnaeus) [Spectacled/Binocellate cobra]

Naja naja kaouthia Lesson [Monocellate cobra]

Naja naja oxiana (Eichwald) [Black cobra]





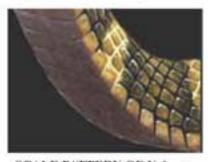


Naja naja naja

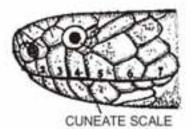
Naja naja kaouthia

Naja naja oxiana

Common Name: Bengali - Naja Gokkura (Gokhro), Tamil - Nalla Pambu, Malayalam - Moorkan Sarpam.







CUNEATE SCALE OF Naja sp.

Identifying Features:

- These three species are recognized on the basis of hood pattern.
- Wide, expanded, heavy head with moderately large eyes having round pupil.
- Snout short and rounded.
- The most distinguishing feature is the presence of a small "cuneate" (a tiny angular shield) scale between 4th and 5th infralabials.

- Preocular touching the internasal.
- Seven supralabials, the 3"(the largest) and 4" of which are connected with eye.
- Hood formed by the elongated ribs of the 3rd and following 27 vertebrae.
- Anterior portion of the body dorsoventrally flattened and the posterior portion is cylindrical.
- Nostrils large.
- Strongly oblique, smooth, oval scales with gap between scales. Vertebral scale row not enlarged. (In kraits, of the same family and also commonly used in skin trade, vertebral scale row distinctly enlarged and hexagonal.)
- Scale count :

Naja naja naja: neck 25-35, body 21-25, ventral 176-200, caudal 48-75

Naja naja kaouthia: neck 25-31, body 19-21, ventral 164-196, caudal 43-58

Naja naja oxiana: neck 23-27, body 21-23, ventral 186-213, caudal 62-75

Hood characteristics:

Naja naja kaouthia - Single yellow or orange O- shaped mark / oscicle.

Naja naja naja - Two spots / oscicles on hood.

Naja naja oxiana - No spot, Head black.

Length usually from 1,371 to 1,652 mm.

Distribution:

India Indian subcontinent. (Found almost anywhere mainly in the plains, open fields, holes of embankments, hollows of trees, old termite mounds, ruins, rock piles, etc.)

Abroad Sri Lanka, Transcaspia, Southern China, Philippines.

Remarks:

Usually not aggressive except under extreme provocation. Main foods are rats, mice, frogs, birds, eggs and snakes. The main reason for the decline in population is the habitat destruction for urbanization. Mainly traded for its skin to make various articles like wallets, purses, belts, bags, etc. The venom is also extracted to manufacture anti-snake venom serum.

KING COBRA OR HAMADRYAD (Poisonous) FAMILY-ELAPIDAE

Scientific Name: Ophiophagus hannah (Cantor)

W(P)A Schedule II(part II) CITES Appendix- II





SCALE PATTERN

Common Name: Oriya - Ahiraj, Bengali - Shankhachur, Shakhamufi Tamil - Krishna Nagam.

Identifying Features:

- Dorsally yellow, olive green, olive brown, blackish or totally black with distinct yellowish or whitish cross bars on the body. Throat light yellow or cream coloured.
- Head has a pair of large occipital shields, which is absent in common cobrat Head flat and wider than neck, with 4 distinct bars.
- Proof is relatively less dilatable.
- Distinguished from common cobra by the absence of cuneate scales.
- Scales glossy, smooth and arranged obliquely. Scale count: Neck 17-19, Body 15, Ventral 240-254, Caudal 84-104. Anal shield undivided.
- Length upto 5.5 m (18 ft. 4 inches). Males longer than females.

Distribution:

India Western Ghats, Orissa, West Bengal, Assam, inhabits hilly jungles. Abroad Philippines, Hong Kong, Thailand, Laos, Vietnam, Mayanmer, Kampuchea, Malay Peninsula.

Remarks:

Largest venomous snake and third longest snake in India. Feeds mainly on snakes, monitor lizards. Good climber and fond of water. Extremely vulnerable due to over-exploitation for its skin.

SCHEDULE IV - Snakes (Other than those listed in Schedule I; Pt II; Schedule II; Pt II)

L. FAMILY AMBLYCEPHALIDAE This family is now included under family Colubridae

 FAMILY ANILIDAE. The representatives of this family were found in Ceylon (Now Sri Lanka) previously. But there is no such record from India nowadays.

3 FAMILY BOIDAE

Scientific Names: Python and Eryx species.
Common Names: Pythons, sand boas etc.

Identifying Characters:

- Most primitive groups having a pair of internal hind limbs near the vent.
- Massive body. Mouth large and flexible. Mandibles with distinct coronoid bone.
- Dorsal scales small and smooth, ventral scales transversely elongated.
- Large with vertical pupil in pythons and small eyes with boas.
- Prefrontal is in contact with the nasal.
- Supratemporal attached scale like to cranium.
- Jaws with teeth which are long, curved, backwardly pointed, needle sharp.
- Labial pits present in pythons, it functions as heat receptors to locate the worm blooded prey.
- Head broad, somewhat triangular, quite distinct from neck.
- Short and partly prehensile tail.

Remarks: Feed mainly on birds, small mammals, lizards and amphibians that killed by constriction and swallowed whole. Pythons prefer marshes, gallery forests and rocky areas near marshes, streams and other water bodies. Largely exploited for skin and flesh.

4. FAMILY COLUBRIDAE

Scientific Names: Pareas, Stolickzkaia, Elaphe, Ptyas, Zaocys, Argyrogena, Sphalerosophis, Opheodryas, Leopeltis, Coronella, Oligodon, Calamaria, Dendrelaphis, Chrysopelea, Lycodon, Dinodon, Dryocalamus, Sihynophis, Amphiesma, Xenochrophis, Rhabdophis, Natrix, Pseudoxenodon, Macropisthodon, Atretium, Trachischium, Rhabdops, Blythia, Xylophis, Boiga, Psammophis, Ahaetulla, Enhydris, Homalopsis, Cerberus, Gerardia, Fordonia, Cantoria, Bitia, Herpeton, etc.

Common Names: Trinket snakes, Rat snakes, Racers, Kukri snakes, Bronzebacks, Wolf snakes, Keelbacks, Cat snakes, Egg eating snakes, Snail eaters, etc.

Identifying Characters:

- Facial bones movable.
- Prefrontal not in contact with the nasal.
- Supratemporal loosely attached to the skull.
- Mandible without coronoid bone, teeth solid.
- Scales on the head large and regularly arranged.
- Belly scales as wide as body.
- No trace of hind limbs.
- Colouration highly varied.
- Tail long. Eyes large.
- Dorsal scales small, rhomboidal and overlapping.



Oligodon arvensis

Remarks: Widely distributed snakes. Some terrestrial, some arboreal, some fossorial, some aquatic. Small species feed on worms and insects. Larger ones feed on birds and mammals which are killed by rapid constriction. Traded mainly for skin and for flesh also.

5. FAMILY DASYPELTIDAE It is now included under family Coldbridge.

6. FAMILY ELAPIDAE

Scientific Names: Bungarus, Callophis, Nata, Ophophagus, etc.

Common Names: Kraits, Cobras, Coral snakes, King Cobra, Mambas, etc.

Identifying Characters:

- Characters are like columndae, except the dentition pattern
- Mandible without coronoid bone.
- Posson fangs attached to the anterior end of the maxillary bone, followed by one or more solid teeth (Proteroglyphus condition of teeth).
- Head shield normal, loreal absent.
- Tail cylindrical.



Bungarus fasciatus

Remarks: These are terrestrial and have fixed fangs on either side of the upper jaw. Extremely poisonous

7. FAMILY GLAUCONIIDAE It is now included under family Leptotyphlopidae.

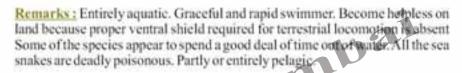
8. FAMILY HYDROPHIDAE

Scientific Names: Laticauda, Aepyurus, Kerilia, Praescutata, Enhydrina, Hydrophis, Thalassophis, Kolphophis, Lepemis, Astrotia, Pelamis, Microcephalophis, etc.

Common Names: Seasnakes

Identifying Characters:

- Cranial characters are very much similar as in the elapidae.
- Mandible without coronoid bone.
- Anterior most maxillary teeth large, erect fang, which is grooved and connected with the poison gland.
- Nostrils situated on the upper surface of the snout.
- Tongue short with protrusible cleft portion.
- Loreal absent. Body scale small, rhomboidal and overlapping.
- Body more or less compressed posteriorly.
- Tail strongly compressed and paddle shaped.
- The pad springs from the anterior margin of the nostril. It consists of dense spongy tissue and has no external orifice.



9. FAMILY ILYSHDAE Synonym of family Amilidae.

10. FAMILY LEPTOTYPHLOPYDAE

Scientific Names Lepyotyphlops macrorhynchus Jan, Leptotyphlops blanfordi (Boulenger)

Compron Names: Thread snakes.

Identitying Characters:

- Maxilla bordering the mouth.
- No teeth on the upper jaw.
- Prefrontal forming a suture with the nasal.
- No supratemporal.
- Mandible with coronoid bone.
- Pelvis with ilium, ischium and pubis.
- Body cylindrical of equal diameter throughout.
- Body fully covered with uniform cycloid scales.
- Eyes vestigeal under the shields.

Remarks: Small degenerate burrowing snakes. The Indian species are distinguished by the presence of nasal and ocular shields bordering the lip. This is not seen in the *Typhlops*. Oviparous, feeding mainly on the termites and other soil arthropods.

II. FAMILY TYPHLOPIDAE

Scientific Names: Ramphotyphlops and Typhlops species, etc.



Hydrophis cyanocinetus

Common Names: Blind snakes, Worm snakes.

Identifying Characters:

- Small, degenerate, secretive forms.
- Elongate, cylindrical bodies and having short stubby tails, tail ends in a spine.
- Uniform, closely fitted polished cycloid scales covered the body uniformly.
- Tiny specks like eyes concealed beneath the head scutes/shields.
- Small, crescent shaped mouth and it is not distendable.
- Upper jaw bears few teeth. Toothless mandible with coronoid bone.
- Vestigial pelvis fused to a single bone or entirely absent.
- Prefrontal forms a suture with the nasal.
- Supratemporal absent.

Remarks: Expert burrowers in soft soil. By the use of the blunt snout and spiny tail they can dig rapidly. Feed on worms, ants and their eggs, termites, soft bodied soil arthropod. Mainly insectivorous. Oviparous, burrowing earthworm eating wormlike snakes.

Scientific Names: Melanophidium, Platyplectrurus, Teretrurus, Pleetrurus, Uropeltis, Rhinophis, Pseodotyphlops, etc.

Common Names: Uropelts, Rough tails, Shieldtails, etc.

Identifying Characteristics.

Identifying Characters:

- Skull solidly united.
- Small uniform teeth on the maxilla and mandible.
- Prefrontal forming a suture with the nasal.
- Suprateorporal, postorbital, loreal small or absent.
- Mandible with coronoid bone.
- Body short, cylindrical of equal diameter throughout.
- Body covered with uniform cycloid scales. Scale smooth, larger on ventral side.
- Eyes small with round pupil
- Tail very short, ending in a large, rough, naked, file-like shield.

Remarks: These are small burrowing snakes found in South Indian hills. Viviparous and secretive snakes. Show fossorial adaption. Also dig soft soil. Feed on soft bodied soil arthropods & worms. Major snakes of this family are brightly coloured. Quiet and inoffensive.

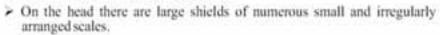
13. FAMILY VIPERIDAE

Scientific Names: Vipera, Echis, Hypnale, Trimeresurus, etc.

Common Names: True vipers, Pit vipers, etc.

Identifying Characters:

- Cranial characters like that in Elapidae, but maxillary bone vertically clongated, no other maxillary teeth except the poison fangs, which are large, erectile, tube like and greatly developed.
- Broad, flat, triangular head, eye pupil elliptical.
- Thick body, tail short, often prehensile.





- Series of blotches or wavy bands both on the dorsum and the belly.
- Dorsal scales small, rhomboidal and overlapping.
- Ventral scales transversely enlarged.



Trimeresurus monticola

bai

Remarks: Possesses long poison fangs. Mostly ground dwellers and found in the rocky, mountainous regions. Sluggish creatures and can not chase their prey. Small mammals form their chief article of diet, but also feeds on lizards, frogs and toads, birds, their eggs and other snakes.

14. FAMILY AF SOPELTIDAE

Scientific Natures: Xenopeltis unicolor Reinwardt, etc.

Sunbeam snake.

Identifying Characters:

- Bones of the skull united. Tail short, subcaudals paired.
- Prefrontal is in contact with the nasal.
- Supratemporal intercalated in the cranial wall.
- Head covered with large shields. No coronoid bone.
- Body cylindrical, scales smooth, in 15 rows throughout, ventrals well developed and enlarged.
- Auditory bones are completely different from other groups of snakes.

Remarks: Snakes having polished scales. Inhabits chiefly the rice fields, gardens in the vicinity of human habitations, living in the earth or hiding beneath logs or stones. Feed on other snakes and small rodents, frogs or birds. Nocturnal, burrowing, gentle creatures. Found only in the Andaman Islands in India.

GLOSSARY

- Armour Protective covering.
- Callosities An abnormal hardness and thickness of the skin.
- 3. Cannibalistic Eating one's own kind.
- Carapace Bony upper shield of a tortoise or turtle.
- 5. Carinate Having a keel.
- 6. Carnivorous Feeding on animal matters only.
- Casque Cephalic head appendage.
- 8. Caudal Pertaining to the tail region.
- 9. CITES Convention on International Trade in Endangered Species of Wild Fauna & Flora.
- Costal Rib or ventral body scales. Side shields of carapace.
- 11. Cuneate Wedge shaped.
- 12. Denticulate Having small tooth-like projections.
- 13. Diurnal Belonging to the daytime.
- 14. Dorsal Pertaining to the upper surface.
- 15. Endemic Restricted or indigenous to a particular area.
- Flipper Limb adapted for swimming.
- 17. Frontal Head shields between orbits.
- 18. Herbivorous Feeding on the plant matters only.
- Hood Expansible region just behind the head in snakes.
- 20. Infralabini Beneath the lip.
- 21. Insectivorous Feeding on the insects only.
- 23. IUCN International union for the Conservation of Nature and Nature

 24. Juxtaposed Placed side by side or placed in approxition to the state of the state
- 24. Juxtaposed Placed side by side or placed in apposition to, not include 25. Kerl Elongated ridge on the scale.
 26. Labrial Of the lip.
 27. Lorral Space between the snout and the eye.
 28. Marginal Plates forming the edge of the parameter.

- 28. Marginal Plates forming the edge of the exceptor
- 29. Muzzle Tip of the snout.
- 30. Notch Deep cleft on the shell
- 31. Nurhal Scale Scales of the took of the neck.
- 32. Occipit A coloured spot on the body of the snake.

 33. Occipital occipital registrof the vertebrate skull forming the back of the head.
- 34. Omnivers Feeding both on animal and plant matter, 35. Parolid Clause An important salivary gland of animals.
- 36 Pharmers Bones of the digits (fingers and toes).

 37 Pharmers Bony ventral shield of a tortoise or turtle shell.
- 38. Post orbital Scale or structure behind eye.
- 39. Prefrontal Head shield preceding the frontal shield.
- 40. Prehensile Able to grasp.
- 41. Preocular In front of the eye.
- 42. Protrusive Thrusting or impelling forward.
- 43. Scavengers Animals that feed on garbage.
- 44. Scute A horny epidermal shield.
- 45. Snout The elongated nose.
- 46. Spura Needle like.
- 47. Subcaudal Below the tail.
- 48. Supralabial Of the upper lip.
- 49. Temporal Of the temple region.
- 50. Terrestrial Living on the ground.
- 51. Truncate Cut short.
- 52. Tympannun Membrane separating the outer ear from the middle ear (in reptiles there is no outer ear and tympanum is exposed at the skin surface).
- 53. Venom Poison of reptiles.
- 54. Ventrals Belly shields.
- 55. Verrebral scale / shirid Central scale / shield pertaining to backbone.
- 56. Viviparous Animals giving birth to young ones.
- 57. Webbed Toes connected by membrane.
- 58. W(P)A Wildlife (Protection) Act

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Amphibia







SUBJECT

INTRODUCTION
AMPHIBIA LISTED IN W(P)A
Himalayan Newt or Salamander (Tylototriton verrucosus)
Viviparous Toads (Nectophrynoides sp.)
Freshwater Frogs (Rana spp.)
Comparison of identifying features of Rana with other genera of Ranidae.
List of species currently under Genus Rana in India
Status of different species of Rana in India
i) Endemic Species
ii) Non Endemic Species

INTRODUCTION

The word "amphibia" means "double life" referring to aquatic tadpole and the terrestrial adult stages. Amphibians are vertebrate poikilotherms having part of their life cycle in water and part on land. They include over 5000 species. They breathe through gills in water, developing lungs later and using them after metamorphosis. Respiration may also be cutaneous, occurring through osmosis.

ORDERS OF LIVING AMPHIBIANS:



Anura - It includes frogs and toads. Found all over the world, in nearly every habitat, anurans are a highly diverse group of amphibians. Frogs are likely the most recognisable group of amphibians.



<u>Caudata</u> - Salamanders, newts, amphiuma, etc. are amphibians of the order Caudata (Urodela), commonly referred to as the "tailed amphibians". Tail is lacking in frogs and often overlooked in caecilians.



<u>Gymnophiona</u> (Apoda) - Also called Caecilians, these are long, segmented, limbless amphibians, making them distinct from any other amphibian order. Some species are aquatic and some terrestrial, or more accurately, fossorial/burrowing.

Anura - The term "anura" roughly translates to "without a tais" and refers to the lack of tails in adult frogs. There are exceptions to the "typical" frog, as some have developed adaptations for fossorial, aquatic and arboreal lifestyles. Some may be magnificently colored in bright reds, oranges, blues, pinks and just about every other color, while others may be subtle browns or greens. Many species can change their colors to better blend into their environment or by chemical cases. Frogs can be as small as 1/2 an inch or as big as 12 inches in length (in Conrava goliath, the Goliath frog from Cameroon, which is the largest known frog) and can jump up to 20 times their length. The skin is smooth, unkeratinized and hangs loosely on the body because of the lack of loose connective tissue.

Generally, frogs have long legs with webbed toes. The true frogs have a tongue with two lobes on its free end; it is attached in front. The frog catches insects with the sticky end of its long tongue that extends faster than is visible to us and then retracts its eyeballs to help push the food down its gullet. Frogs have three eyelid membranes: one transparent to protect the eyes underwater and two which are transluscent to opaque like human eyelids. They have a tympanum on each side of their head, which is involved in hearing. Externally, anurans differ from caudates and caecilians by the presence of four limbs, of which the hind limbs are typically larger and modified for leaping or climbing. Anurans are also unique in that they are capable of vocalizing and produce an array of sounds from squeaks to barking noises.

Caudata - Members of the order Caudata, often called Urodela, include salamanders, newts, waterdogs, mudpuppies, sirens and amphiuma. There are 10 recognised salamander families, with just more than 500 species. Typical caudates have four limbs of similar size that are used for terrestrial walking. Caudata display an array of physical appearances, some with highly reduced appendages and others with advanced structures. Adult salamanders and newts possess four limbs and a tail. Forelimbs have 4 toes and hindlimbs have 5 toes.





Gymnophiona - Caecilians, order Gymnophiona or Apoda, are perhaps the least studied amphibians and definitely the most alien form. Caecilians are long, segmented, almost worm-like amphibians that live underground and in aquatic habitats. Most species are found in tropical and subtropical environments in South America, Asia and Africa. Caecilians lack appendages and have powerful heads and highly ossified skulls for burrowing, highly acute olfactory systems and are the only amphibians to possess dermal scales. Head and tail are not distinct from the body. Eyes are small, rudimentary and concealed beneath the skin.

So, what defines an amphibian? Although highly diverse, all amphibians are quadrupedal (four-legged) vertebrates or were at some point in the evolutionary process, possessing two occipital condyles on the skull and no more than one sacral vertebra. Amphibian skin is mostly soft and moist, naked, lacking hair, feathers or "true" scales and is highly glandular with mucous glands.

TYPES OF COMMON IDENTIFYING FEATURES

DEYES

Salamanders have large pupils and smaller iris compared to frogs. The iris of the eyes of some frogs may have such shapes as a heart, a star or a triangle. The colored part of the eye is called the iris. They can be brown, green, silver, red, bronze and even gold in amphibians. The pupils (black in colour) come in all kinds of shapes too.

 Round pupils: Some-frogs have round pupils just like human beings. Newts and salamanders also have round pupils.



(2) Vertical pupils: Vertical pupils that look like a cat's eye are really good for night vision and respond quickly to changes in light, (eg. Painted frogs)



(3) Horizontal-shaped pupils: These are the more common pupil, good for normal daylight and found in tree frogs and true frogs.



(4) Heart-shaped pupils: Oriental fire-bellied toads have this type of pupil. Some frogs have Triangular pupils and some even have Star-shaped pupils!



IDTONGUE



a) Entire, oval; (b&c) bifid (with and without papilla); d) entire, pyriform

HIDTEETH

Most frogs have a ridge of very small cone teeth around the upper edge of the jaw. These are called Maxillary Teeth and can be felt with a finger if not visible. Frogs often also have what are called Vomerine Teeth on the roof of their mouth. They don't have anything that could be called teeth on their lower jaw in Indian species, so they usually swallow their food whole. The so-called "teeth" are mainly used to hold the prey and keep it in place till

they can get a good grip on it and squash their eyeballs down to swallow their meal. Toads, however, do not have any teeth. Maxillary teeth are present in salamanders/newts and both jaws are toothed.

(V) FEET

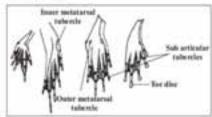


Fig: Foot webbing in frogs

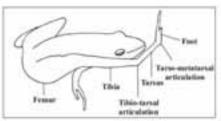


Fig: Parts of the leg in frogs

V) EARS

Frogs can hear using big round ears on the sides of their head called tympanum. Tympanum means drum. The size and distance between the ears depends on the wavelength and frequency of a male frog's call. On some frogs, the car is very hard to see. Actually, frogs have special ears that are connected to their lungs. When they hear noises, not only does the eardrum vibrate, but the lung does too. Scientists think that this special pressure system is what keeps frogs from hurting their ears with their noisy ealls. Tympanum and eardrums are absent in Caudata.

DIFFERENCE BETWEEN FROGSAND TOADS

Most are surprised to hear that all Toads actually are Frogs!

Frog



Generally speaking, though, when we think of frogs, we generally picture what are called "True Frogs" i.e. members of the family Ranidae, containing more than family includes 25 genera. These 400 species. These frogs have the following characteristics:

- · two bulging eyes
- · strong, long, webbed hind feet that are adapted for leaping and swimming

Toad



The term toads tends to refer to "True Toads" i.e. members of the family Bufonidae, containing more than 300 species. Besides Bufo, the types of frogs are characterised by:

- · stubby bodies with relatively shorter hind legs (for walking instead of hopping)
- warty and dry skin





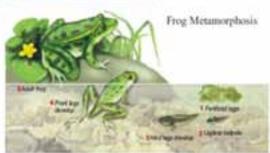
- · smooth or slimy skin
- tendency to like moister environments
- · usually no parotoid glands
- · tendency to lay eggs in clusters.
- teeth maxillary & vomerine may be present
- · bilobed tongue
- · free fingers; webbed toes
- terminal phalanges of various shapes & sizes

- · usually prefer dryer climates
- parotoid (or poison) glands behind the eyes
- tend to lay eggs in long chains. (There are some toads i.e. genera Nectophrynoides, that are the only types of anurans to bear live young)
- maxillary & vomerine teeth absent
- · oval tongue
- terminal phalanges of fingers & toes obtuse or T-shaped

NB: Species of Ranidae can be distinguished from all other Indian amphibia except Rhacophoridae by the presence of teeth on upper jaw and bifid tip of tongue.

The physical distinctions, however, can easily get blurred because sometimes the features appear mixed or less obvious and certain species even legitimately fall into both categories. It is not uncommon, for example, to find a warty skinned frog that isn't a toad, or even a slimy toad. Even the more invisible stuff like cartilage structure has been found to sometimes fit both categories.

LIFE CYCLE OF AMPHIBIA



Life cycle of Frog



Tadpole



Salamander Larva

Amphibian life cycle shows "metamorphosis" wherein eggs laid in water develop into a distinctive tadpole / larval stage which transforms into adult form. Frog tadpoles feed on algae and small organisms; larval salamanders and newts are carnivorous and feed on aquatic arthropods. Larvae of most species possess gills and fins, acquiring legs and lungs during metamorphosis.

TRADEINAMPHIBIANS

Although frogs have poisonous skin glands, these toxins do not usually protect them from predatory mammals, birds and snakes. Edible anurans have to rely on more than just poison glands which tend to work too late (i.e. after the predator has it in its mouth). Frog legs are consumed in various parts of the world especially in China for medicinal purpose. Bufo toxins are used in Chinese traditional medicines. Many of these substances are

hallucinogenic. New discoveries are also made eg. nicotine and morphine like substances from Ecuadorean poison dart frog leading to development of painkiller ABT - 594. Most of the frog legs served as gastronomic delicacies in Europe are made from Asian bullfrogs. The majority of these frog legs are imported from Bangladesh, Malaysia, India and most recently Indonesia. Indonesia has become the largest suppliers of frog legs to Europe. The European Community imported 6,202 tonnes of frogs' legs in 1990. Belgium and Luxembourg consumed 44% of the imports while 42% went to France.







Frog legs (raw)

Fried frog legs

Although many species of anurans are consumed locally throughout the world, only Rana catesheiana, Rana hexadactyla and Rana tigrina are harvested for export. Rana tigrina was earlier exported from Bangladesh, India and Indonesia; Rana hexadactyla exported only from India. China has recently banned the harvesting of Rana tigrina. Rana catesbiana, native to North America, has been introduced into South America, the islands of the Pacific, Europe and Japan. The species is commercially exploited in the United States, Brazil and Japan for its flesh and/or skin.









Rawa crassa / Hoplobatrachus crassus Rana hexadactylus

Euphlyctis hevodactyles/

Rana tigerina/ Hoplobatrachus tigerina

Anurans are commonly used as biological specimens while larvae are used in scientific laboratories for work related to endocrinology, developmental physiology, etc. Toad skin is used to make leather articles. The skin of Rana tigrina is fashioned into luxury items in Thailand. The indiscriminate broadcasting of insecticides in the Indian subcontinent has contributed further to the destruction of the environment and the interdependent fauna.

LEGISLATION

International trade is regulated through Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and requires presentation of CITES permits / other documents at the time of export/import. Amphibian species listed in CITES are :-

Appendix - 1: Altiphrynoides spp, Atelopus zeteki, Bufo periglenes, Bufo superciliaris, Nectophrynoides spp., Nimbaphrynoides spp., Spinophrynoides spp., Dyscophus antongilii, Andrias spp.



Altiphrynoides sp



Ateloma zereki



Bido periplenes







Dyscophur antongilii



Andrian



Appendix - II: Dendrobates spp., Epipedobates spp., Minyobates spp., Phyllobates spp.,
Mantella spp., Scaphiophryne gottlebei, Rheobatrachus spp., Euphlyctis hexadactylus,
Hoplobatrachus tigerinus, Ambystoma dumerilii, Ambystoma mexicanum.



Indian amphibians, which are about 205 taxa in number have a very high representation of endemics. Nearly 63% of the amphibians are endemic to India. Western Ghats is the richest region in India in terms of amphibian endemicity. Ninety-three taxa are endemic to this biogeographic region with 2 more taxa sharing their distribution with adjacent areas. Northeastern India, which has a very high diversity among amphibians does not have many endemics within the Indian context because of the jagged political boundary of the country. Keeping in view the importance of amphibia, threats faced and large scale trade in some species, protection is provided to some amphibia through Wildlife (Protection) Act.

This manual is meant for identification of species of amphibia listed in Wildlife (Protection) Act 1972, viz. Himalayan Newt or Salamander (Tylototriton verrucones) - schedule II, Fresh water frogs (Ranu spp.) - schedule IV and Viviparous toads (Nectophrynoides sp.) - schedule IV. The matter has been diligently collected and collated by Shri Rakesh Burman, Technical Assistant of this office, helped and guided by Wildlife Inspectors Shri G. L. Purohit & Shri S. V. Sheshadri. Our grateful thanks are due to Dr. Kaushik Deuti, Senior Zoological Assistant, ZSI, Kolkata for his enthusiastic contributions as well as others in ZSI and BNHS for assistance with respect to photographs, etc.

HIMALAYAN NEWT OR SALAMANDER

Scientific Name:

Tylototriton verrucosus Anderson, 1871

W(P)A Schedule II (Part I) CITES Not listed

Synonym:

Burmese Crocodile Newt





Larva

Adult

Identifying Characters:

 A lizard like amphibian with a broad, flattened, obtusely triangular head showing lateral cranial ridges curving inwards, rounded snout and tuberculated/glandular skin.

 Length 15-20 cm (Including tail which is half its total length).

- Eyes have conspicuous, granular upper cyclid.
- iv) Nostrils semi-circular, covered with valvular flap of skin and widely separate.
- Parotoid glands on both sides of the head are large, somewhat concave and distinct.



Head & upper body (enlarged view)

- About 15 knob-like porous glands on both sides of the body, three of which extend past the leg when held at right angles to the body.
- vii) A broad, prominent, glandular, median ridge present all along back of body and tail.
- viii)Limbs are of moderate size with four fingers and five toes with no webbing on them.
- ix) Underside transversely wrinkled.
- Tail laterally compressed with a sharp-edged upper crest and lower margin rounded.
- xi) The anal opening is a longitudinal slit.
- xii) Colour blackish or dark brown on the upperside but paler on the underside of the lips, chin, throat and limbs. Underside of the tail is orange-yellow.

<u>Distribution:</u> Darjeeling hills of West Bengal, Sikkim, Manipur, Arunachal Pradesh.





VIVIPAROUS TOADS

Scientific Name:

Nectophrynoides sp.

W(P)A Schedule IV CITES - Appendix 11

The viviparous toad - One of the most intriguing species is a viviparous toad, the only amphibian in the world to give birth to fully developed baby toads. Other amphibians lay eggs. In frogs and toads, eggs become tailed tadpoles with external gills and then metamorphose into tailless frogs/toads with lungs and in salamanders eggs develop into larvae with gills which in turn become tailed salamanders with lungs. Nectophrynoides can be found in the grasslands at 1,200-1,600 m and is the world's only known tailless amphibian that is totally viviparous. Nectophrynoides is a genus under Bafonidae, features of which are listed under Toads in Introduction. Photographs of some species are given below.



Nectophrymoides spp.



No tophymalder stylnomer



Nectophrynoides vistergaanli



Necrophrymoides tornieri



Nectophrymoides occidentalis



Kihansi Spray Toad (Noctophrynoides asperginis)

NB: In this regard it should be mentioned that Nectophryne (currently Pedostibes) is another genus of family Bufonidae found in India and is not listed in the Wildlife (Profection) Act 1972. Nor is it viviporous in nature. But the genus is confused with that of Nectophrynoides which is viviparous.



Nectophryme tuberculosus / Pedostibes tuberculosus (Malabat tree toud)

FRESHWATER FROGS

Scientific Name: Rana spp. Linnaeus 1758

W(P)A Schedule IV CITES Not listed

Identifying Characters:

- Lacks smooth skin.
- Deeply notched, free tongue, bifid behind & attached in front.
- Pupil horizontal.
- Eardrum distinct, sometimes hidden. iv)
- Parotoid gland absent.
- Fingers free, toes webbed. vi)
- vii) Tips of fingers and toes are simple or dilated.
- viii) Discs on toes/fingers without transverse grooves.
- Terminal phalanges obtuse or T-shaped.
- Vomerine teeth present in most species.

SOME Rana spp. FOUND IN INDIA:-



Rana unirantiaca Status - LR-nt



Rana leptoslactylus



Status - Unknown



Rana malabarica Status -LR-nt



Rana nigrovittata Status - EN



Rana curtipes Status - LR-nt



Rana kuhlii Status -Unknown



Rana livida Status - LR-nt



Rana temporalis Status -Unknown



Rana chalconata Status - EN



Rana leptoglassa Status - EN



Rana nicobariensis Status - LR-nt



Rana tvtleri Status - Unknown



COMPARISON OF IDENTIFYING FEATURES OF Rang WITH OTHER GENERA OF RANDAE:

Lincoln WIPA*	Not in W(P)A	Miritahy Notin W(P)A	Northern school	Not in William	North W(P)A	Kerimbes Norin WiPJA	Somegreene North WIPA
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room	Herzontal	Horamaly	Vertical	Bround	Horzonally sval	Herzomally eval	Bernotal
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*WiPJA - Wildlife (Prototton) Act.

Rana aurora Status - NT Rana boylii Status - NT Rana capito Status - NT Rana nigromu uluta Status - NT **Rana muscosa** Status - VU Rama Inctiona Status - Unknown

Rana stalicu Status - Unknown



Rana busana Status - VU











Rana epeirotica Status - VU







Rana pyrenaica Status - VU



Status - Unknown













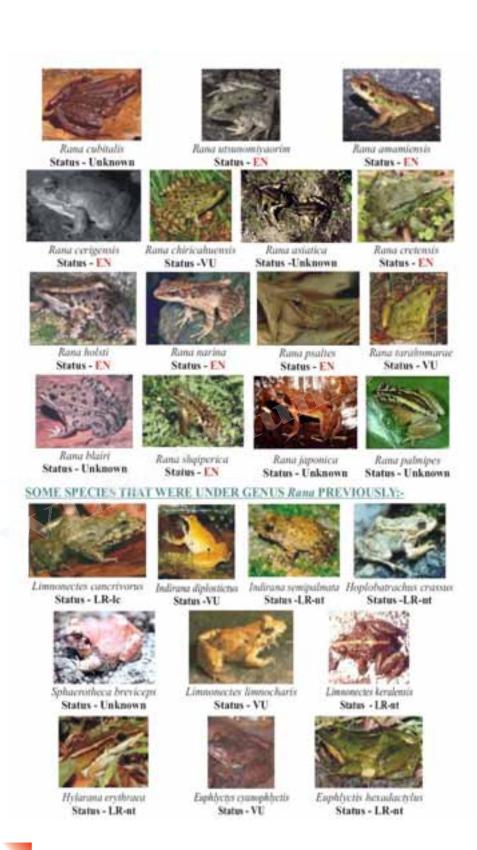




Rana iberica Status - NT







LIST OF SPECIES CURRENTLY UNDER GENUS Rana and found in India*:-

1. Rana alticola (Boulenger 1882)	Ranidae	LR-nt
2. Rana annandalii Boulenger 1920	Ranidae	Not known
3. Rana assamensis (Sclater 1892)	Ranidae	LR-nt
4. Rana aurantiaca (Boulenger 1904)	Ranidae	LR-nt
5. Rana blanfordii Boulenger 1882	Ranidae	Not known
6. Rana chalconata (Schlegel)	Ranidae	EN
7. Rana charlesdarwini Das, 1998	Ranidae	Not known
8. Rana chitwanensis Das, 1998	Ranidae	Not known
9. Rana chloronota (Günther, 1876)	Ranidae	Not known
10. Rana curtipes Jerdon 1854	Ranidae	LR-nt
11. Rana danieli Pillai & Chanda 1977	Ranidae	LR-nt
12. Rana doriae Boulenger 1887	Ranidae	Not known
13. Rana garoensis Boulenger 1920	Ranidae	EN
14. Rana hascheana (Stoliczka, 1870)	Ranidae	DD
15. Rana himalayamıs Boulenger 1888	Ranidae	Not known
16. Rana humeralis Boulenger, 1887	Ranidae	Not known
17. Rana khare (Kiyasetuo & Khare 1986)	Ranidae	EN
18. Rana kuhlii Tschudi 1838	Ranidae	Not known
19. Rana leptodactyla Boulenger 1882	Ranidae	Not known
20. Rana leptoglossa (Cope, 1868)	Ranidae	EN
21. Rana livida (Blyth 1855)	Ranidae	LR-nt
22. Rana mulabarica Tschudi 1838	Ranidae	LR-nt
23. Rana minica Dubois 1975	Ranidae	Not known
24. Rana nicobarensis (Stoliczka 1870)	Ranidae	LR-nt
25. Rana nigrovittata (Blyth)	Ranidae	EN
26. Rana semipalmata Boulenger 1882	Ranidae	Not known
27. Rana senchalensis Chanda 1987	Ranidae	CR
28. Rana xikkimensis Jerdon 1870	Ranidae	Not known
29. Rana taipchensis Van Denburg	Ranidae	LR-nt
30. Rana temporalis (Gunther, 1864)	Ranidae	Not known
31. Rana tenuilingua Rao 1937	Ranidae	Not known
32. Rana travancorica Annandale 1910	Ranidae	DD
33. Rana tytleri (Theobald, 1868)	Ranidae	Not known
34. Rana vicina Stoliczka 1872	Ranidae	Not known

EN-Endangered, VU-Vulnerable, DD-Data Deficient, LR-nt-Lower risk (nearly threatened), LR-le-Lower risk (least concern), CR-Critically Endangered.

Sources: (1) ZSI Publications., 2) The IUCN Red List of Threatened Species, (3) Report based on Biodiversity Conservation Priorotisation Project (BCPP) Endangered Species Project Conservation Assessment and Management Plan (CAMP) workshops, Amphibians of India, hosted by Utkal University, Bhubaneshwar, 22-26 April, 1997 (Source: Zoo Outreach Organisation Website), (4) Database of American Museum of Natural History

^{*} List not exhaustive



STATUS OF DIFFERENT SPECIES OF GENUS Rana IN INDIA (i) ENDEMIC SPECIES*

SPECIES NAME	FAMILY	IUCN STATUS	
Rana aurantiaca (Boulenger 1904)	Ranidae	LR-nt	
Rana curtipesJerdon 1854	Ranidae	LR-nt	
Rana danieli Pillai & Chanda 1977	Ranidae	LR-nt	
Rana garoensis Boulenger 1920	Ranidae	EN	
Rana khare (Kiyasetuo & Khare 1986)	Ranidae	EN	
Rana malabarica Tschudi 1838	Ranidae	LR-nt	
Rana senchalensis Chanda 1987	Ranidae	CR	
Rana travancorica Annandale 1910	Ranidae	DD	
Species renamed (Formerly under genus Rana)	10	.22.	
Euphlyctis ghosi (Chanda 1990)	Ranidae	EN	
Indirana beddomii (Gunther, 1876)	Ranidae	VU	
Indirana brachytarsus (Gunther 1876)	Ranidae	VU	
Indirana diplostictus (Gunther 1876)	Ranidae	VU	
Indirana leithii (Boulenger 1888)	Ranidae	LR-nt	
Indirana leptodactylus (Boulenger 1882)	Ranidae	VU	
Indirana semipalmatus (Boulenger 1882)	Ranidae	VU	
Indirana temilingua (Rao 1937)	Ranidae	DD	
Limnonectes andamanensis (Stoliczka 1870)	Ranidae	LR-le	
Limnonectes brevipalmatus (Peters 1871)	Ranidae	LR-nt	
Limnonectes keralensis (Dubois 1981)	Ranidae	LR-nt	
Linnonectes khasiensis (Anderson 1871)	Ranidae	DD	
Limnonectes mawlyndipi (Chanda 1990)	Ranidae	CR	
Limnonectes mawphlangensis (Pillai & Chanda 1977)	Ranidae	CR	
Limnonectes murthii Pillai 1979	Ranidae	EN	
Limnonectes mysorensis Rao 1922	Ranidae	CR	
Limnonectes nilagirica (Jerdon 1854)	Ranidae	EN	
Limnonectes sauriceps (Rao 1937)	Ranidae	DD	

^{*}List not exhaustive

(ii) NON-ENDEMIC SPECIES*

SPECIES NAME	FAMILY	IUCN STATUS	
Rana alticola (Boulenger 1882)	Ranidae	LR-nt	
Rana assamensis (Sclater 1892)	Ranidae	LR-nt	
Rana chalconata (Schlegel)	Ranidae	EN	
Rana erythraea (Schlegel 1837)	Ranidae	LR-nt	
Rana leptoglossa (Cope 1868)	Ranidae	EN	
Rana livida (Blyth 1855)	Ranidae	LR-nt	
Rana nicobarensis (Stoliczka 1870)	Ranidae	LR-nt	
Rana nigrovittata (Blyth)	Ranidae	EN	
Rana taipehensis Van Denburg	Ranidae	LR-nt	
Rana hascheana (Stoliczka, 1870)	Ranidae	DD	
Species renamed (Formerly under genus Rana)			
Euphlyctis cyanophlyctis (Schneider 1799)	Ranidae	LR-nt	
Euphlyctis hexadactylus (Lesson 1834)	Ranidae	LR-nt	
Hoplobatruchus crassus (Jerdon 1853)	Ranidae	LR-nt VU	
Hoplobatrachus tigerinus (Daudin 1802)	Ranidae		
Limnonectes cancrivorus (Gravenhorst 1829)	Ranidae	LR-lc	
Limnonectes doriae (Boulenger 1887)	Ranidae	VU	
Limnonectes limnocharis (Gravenhorst)	Ranidae	VU	
Limnonectes syhadrensis (Annandale 1919)	Ranidae	LR-nt	
Paa annandalii (Boulenger 1920)	Ranidae	EN	
Paa blanfordi (Boulenger 1882)	Ranidae	LR-nt	
Paa hazarensis (Dubois & Khan)	Ranidae	DD	
Paa liebigii (Gunther 1860)	Ranidae	LR-nt	
Paa minica (Dubois 1975)	Ranidae	DD	
Paa sternostignata (Murray 1885)	Ranidae	DD	
Paa vicina (Stoliczka 1872)	Ranidae	DD	

Report based on Biodiversity Conservation Priorotisation Project (BCPP) Endangered Species Project Conservation Assessment and Management Plan (CAMP) workshops, Amphibians of India, hosted by Utkal University, Bhubaneshwar, 22-26 April, 1997 (Source: Zoo Outreach Organisation Website),



^{*}List not exhaustive



Identification Manual on Fishes

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FISHES



SUBJECTS

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Anoxypristis cuspidata (Knifetooth Sawfish)	
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INTRODUCTION

A fish is a poikilothermic (cold-blooded) water-dwelling vertebrate with gills and includes 27000 species. They are divided into 3 main classes viz Agnatha (jawless fish), Chondrichthyes (cartilaginous fish) and Osteichthyes (bony fish). Species from the latter two classes are included in the Wildlife (Protection) Act. Some other aquatic animals are often referred to as fish such as jelly-fish, cuttle-fish, etc. which are actually invertebrate species while whales and dolphins that look like fish are actually mammals.

Cartilaginous fish have jaws, paired fins, paired nostrils, scales, two-chambered hearts and skeletons of cartilage. They are divided into two sub-classes

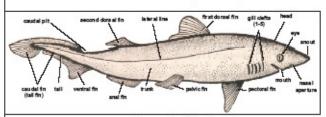


Diagram 1 - Shark

Elasmobranchii and Holocephali. The elasmobranchii consist of sharks, rays, skates, electric rays and sawfishes some of which are protected under the Wildlife

(Protection) Act 1972. They lack in swim bladder and rely on large livers saturated with oil for buoyancy.

Most bony fish are ray finned fish (sub-class Actinopterygii) while the rest are

lobe-finned fish (sub-class Sarcopterygii) including lungfish and coelacambs. Bony fish have operculum that enables them to breathe without having to swim and also have lung or swim bladder. They have "replacement" bone i.e. cartilage is replaced by bone and ossified internally. Head and pectoral girdles are covered by large dermal bones.

Identification of species in fish is based on certain characteristic morphological features such as number and position of different types of fins, teeth, etc. The diagrams 1 and 2 indicate different features and terms associated with them.

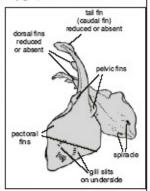


Diagram 2 - Ray

FISHING



Elasmobranchs/cartilaginous fish are among the largest of marine fish with great significance in international market. Every part of their body is useful. Annual fishing records indicate a figure of 100 million tonnes of yield worldwide. The journal Nature reported in 2003 that all oceanic fish species worldwide had been so

systematically overcaught that fewer than 10% of 1950 levels remained. Sharks are among those most threatened. Elasmobranchs are long-lived but attain sexual naturity late and produce very few offspring. Thus, unplanned fishing can only have disastrous consequences. It is concern for survival of the much traded or otherwise threatened species that resulted in species being listed for protection under the Wildlife (Protection) Act 1972 amended in the year 2002.

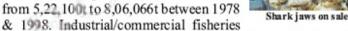
In India, bulk of the shark catches comprised of Carcharhinus limbatus, C.sorrah, C.dussumieri, C.macloti, C.melanopterus, C.brevipinna, C.hemiodon, Rhizoprionodon acutus, R.oligolinx, Scoliodon laticaudus, Galeocerdo cuvieri and Loxodon macrorhinus. Gujarat contributed 22,899t of elasmobranch landings between 1990-2000 (10-15 thousand tonnes in 1980s) and



Tamilnadu contributed 16766 t. Landings of sharks increased from 59%(1981) to 67%(2000) while catches of rays remained constant and that of skates increased then decreased. In 2000, 72% of shark catches and 66% of skate landings in India were from the west coast, particularly north-west coast(58%). Major portion (67%) of rays were from southeastern coast.

Elasmobranch catch from Atlantic Ocean fluctuated between 244100t (1971) to 302666t (1998) while it doubled in Indian Ocean from 110,000t (1971) to 225,566t 1998), main contributors being Indonesia, India and Pakistan. World elasmobranch production also increased







& 1998. Industrial/commercial fisheries use larger vessels and sophisticated gear such as miles long drift nets or long lines while smaller fisheries may use handlines. Gillnets are commonly used i.e. panels of mesh floated on the surface and allowed to drift or fixed at the bottom. Longlines consist of main lines even 80 miles long, hung with smaller lines

with hooks, baited or otherwise. Most shark catches are incidental while fishing for more commercially beneficial species.







lolding teeth of shark Shark teeth trinkets

Shark teeth implement

Specialized shark teeth

ELASMOBRANCHS AND THEIR PRODUCTS IN TRADE

Different cultures have relied for centuries on a variety of products from clasmobranchs such as meat, skins for leather & abrasives (for sanding wooden boats, porcelain, etc), liver oil for textile and tanning industries, lubricants,

cosmetics, cartilage for use in fishmeal preparations and cancer treatments, teeth



and jaws as souvenirs for tourists, etc. The livers of most of the shark species have a high percentage of oil with high vitamin A content. Glyphis gangeticus, Carcharhinus melanopterus, Carcharhinus limbatus, Scoliodon sorrakowah, Scoliodon palasorrah, Scoliodon walbeehnii, Sphyrna zygaena, Pristis microdon, Pristis cuspidatus and Galaecerdo cuvieri are much sought after for made from Shark extraction of liver oil. Shark liver oil especially of



Shark liver oil gelcaps

tiger shark, hammerhead shark, dogfish and catsharks, is a rich source of vitamin A and therefore very much in demand. Recently though, availability of synthetics has brought down the market for vitamin A from shark liver oil. Squalene, which is widely used in products such as bacteriocides, skin moisturizers, etc. is also obtained from shark liver. Crude liver contains about 20-30% stearin, which is used in the manufacture of candles, soaps and paints. It is also used as an antifouling agent for fishing craft. The oil obtained on boiling minced liver is carefully separated using a filter cloth and the liver meal is dried and powdered for mixing in poultry feed.







Shark cartilage powder



Shark fin soup

Shark hide, popularly known as 'shagreen' is a very abrasive material due to denticles and is used to make handbags, watch straps, cowboy boots, belts, expensive leather product known as Boroso, etc. Sharkskin can be processed into quality leather. Not only the meat and liver oil, but also every other part of the organism is made use of. Shark or ray skin with the denticles still in it is a leather of lasting beauty. Denticles are ground by mechanical means. Ocean Leather Corporation of USA is the largest shark skin tannery in the world and has been marketing excellent quality shark leather. Shark leather is used for a variety of luxury articles, men's shoes, belts, wallets, watchstraps and other fine leather goods.



Dish of cooked ray wings



Plain steamed meat of small sharks



Dry shark fin nests



Shark meat is popular in many countries including USA, Europe and Japan. Fibers and gelatinous collagen in shark fins are important for shark fin soup, a great delicacy in China. A chemical compound in cartilage is effective against eye fatigue and rheumatism and in making synthetic skin for burn victims. Export of dried shark fins and shark meat were 302-312t and 583-617t respectively during 1995-99. Shark products have the largest export market among elasmobranchs, having increased from Rs.9.5 crores in 1996-97 to Rs.35.49 crores in 2000-01 (MPEDA, 2000).







Dry spinal columns of sharks



Prepared wet shark fin nests

There is a tremendous increase in the export of shark meat and other shark products from India to various Asian and European countries. Japan, Taiwan, Singapore, Malaysia, China, Hong Kong and Thailand are the main consumers of shark meat and shark related products. Shark fin soup is a fine delicacy relished by the Chinese and many other easterners. China has been the biggest buyer of shark fins and until recently it was an important export item from this country to China. Trade in shark fin is fast growing especially in dried shark fin which are being exported as "fish maws". Usually the 1st dorsal, pectoral and the lower lobe of the caudal fins are highly valued in the foreign market. According to Marine Products Export Development Authority, fins of Sphyrnazygaena, Rhizoprionodon acutus, Scoliodon laticaudatus, Carcharhinus melanopterus, Rhincobatus djiddensis, Negaprion acutidens and Rhiniodon typus were earlier exported from India. Thailand, Malaysia and Singapore are re-exporting unprocessed and processed fins in various forms to western countries. Hong Kong, Japan, Europe and the United States have emerged as major buyers of shark products. A major portion of export takes place from Mumbai and Chennai. The fins are exported to Singapore, Hong Kong, Malaysia, UK and Australia. Japanese are the only people who probably make the maximum use of shark meat.



Shark fin and other choice seafoods



Small sharks and rays



Processed dry shark fins

Chennai port is in the first place in exporting dried shark fins. From 1995-99 it has exported 555.10 tonnes of dried shark fins to various countries. Mumbai port has exported 298.69 tonnes of dried shark fins. Kandla port on the west coast has

exported 1002.75 tonnes of frozen shark meat worth 39 million to various countries from 1995-99 and remains first in frozen shark meat export from India. Apart from these ports Calcutta, Goa, Cochin, Porbander and Tuticorin ports also exported considerable amount of shark and shark products to various countries.

Sr. No.	Item Name	2004 - 05		2003 - 04		2002 - 03	
	Item Name	Qty. ton	Rs. Lakhs	Qty. ton	Rs. Lakhs	Qty. ton	Rs. Lakhs
1	Dried Shark Fins	176	1,457	177	1,582	146	1,988
2	Dried Shark Bones	18	19	9	6	8	18
3	Dried Shark Fin Rays	41	518	34	441	28	427
4	Dried Shark	59	110	2	35	4	5
5	Dried Shark Tail	73	796	23	175	15	83
6	Dried Shark Jaws			4	7	1	13
	Total	367	2,900	249	2,246	201	2,533

TRADE IN BONY FISH

Sea horses, pipefish, etc. are increasingly threatened by growing trade across the world. As per an estimate in 2001, over 25 million sea horses (70t) are caught for use in Chinese medicines (and derivatives like Japanese & Korean medicines, Jamu medicine in Indonesia, etc.) or curios or sold live for aquaria. Curios include dried seahorses made into trinkets like key chains. As a result, populations have reduced by 15-50% from 1990 to 1995 leading to its inclusion for protection under CITES as well as in Wildlife (Protection) Act. Philippines has been the biggest exporter followed by Thailand, Vietnam and India. Local fishermen catch these in dip nets and by hand or as incidental catches when trawling for shrimp.







Green Pipefish



Dried sea horse

Pipefish are similarly traded for Chinese medicines, being considered as the best treatment against colds and flu related illnesses as also for pet trade. However, seahorses, pipefish, etc., rarely survive for long as they need live food like crustaceans. Data related to pipefish is insufficient but in 1998, 12 tonnes were imported into Hong Kong alone from India, Philippines, Singapore, etc. Banded pipefish is the most commonly traded pipefish though Green pipefish and Double-ended pipefish are also sold for aquaria.



Sea dragons are traded mainly as expensive ornamental fish. Export routes are often unofficial/illegal in passenger baggages on commercial flights. At least 77 nations are involved in trade from Equador to Italy to Mozambique to USA. Largest known net importers are China, Hong Kong & Taiwan. Hundreds of thousands of live specimens are traded for sale in N. America, Europe, Japan & Taiwan.

THE LEGAL SCENARIO

State Governments are free to enact laws to regulate fishing as per the principles laid down in clause b & c of Article 39 of the Constitution. The Indian Fisheries Act 1897 is the basis of legislation in most states. The Tamil Nadu Marine Fishing Regulation Act 1983 confers the power on an officer of the rank of Assistant Director of fisheries to regulate and restrict, or prohibit fishing, to issue licenses to the owners of the vessels, to suspend and/or cancel such licenses on the issue of non-compliance of regulations. Registration of vessels is mandatory under Section 11 of the MPEDA Act 1972. Some other relevant legislation are Maritime Zones of India Act 1981, Marine Fishing Act 1981, The Environmental (Protection) Act 1986, etc.

The most important legislation for protection of fish species under threat is however the Wildlife (Protection) Act 1972 which was amended in 2002 to list out a few species of sharks, rays and skates, giant grouper and all sygnathidians/sea horses. Similarly, international trade in fish is also regulated by Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and species listed in Appendix I and II of CITES require proper CITES permit and other formalities. The species listed in CITES are:

Appendix - I : Acipenser brevirostrum, Acipenser sturio, Scleropages formosus, Probarbus jullieni, Chasmistes cujus, Pangasianodon gigas, Totoaba macdonaldi, Latimeria spp.



Chasmistes cujus



Pangasiadon gigas



Latimeria sp.



Acipenser brevirostrum



Scleropages formosus



Probarbus jullieni

Appendix - II: Rhincodon typus, Carcharodon carcharias, Cetorhinus maximus, Acipenseriformes spp. i.e. Paddle fish, sturgeons (except the species included in Appendix - I), Arapaima gigas, Caccobarbus geertsi, Hippocampus spp., Cheilinus undulatus, Neoceratodus forsteri.







Cetorhinus maximus



Arapaima gigas



Sturgeom



Cheilinus undatmes



Neoceratodus forsteri

This identification manual is specifically for identification of species listed in the Schedules of Wildlife (Protection) Act 1972 as amended in 2002. The material has been collected and put together into a comprehensive whole by Shri Rakesh Burman, Technical Assistant of this office with valuable inputs by Shri Sheshadri, Wildlife Inspector and Shri G.L. Purohit, Wildlife Inspector and others. Thanks are also due to Central Marine Fisheries Research Institute, Cochin, Marine Products Export Development Authority, Cochin and Dr. S. C. Mukherjee, Director, Central Institute of Fisheries Education, Mumbai for having contributed by way of literature, data, etc.



WHALE SHARK (FAMILY RHINIODONTIDAE)

Scientific Name: Rhincodon typus (Smith)

W(P)A-Schedule I CITES-Appendix II

Synonym: Rhiniodon typus, Rhinodon typicus, Microstodus punctatus, Rhinidon pentalinetus





Common Name: Whale Shark, Karami, Bahiri, Pullindumboo

Identifying Features:

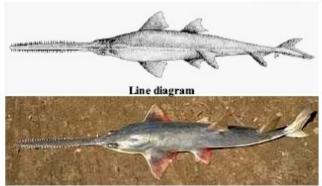
- Largest fish on earth, reported to attain a maximum length of 18 m and weight upto 41,000 kg.
- Dark grey, reddish or greenish brown dorsally. Characteristic vertical band of white or yellowish spots and transverse stripes forming a unique checkerboard pattern.
- 3 longitudinal ridges running obliquely from above the large gill slits downward to above the pelvices.
- 5^a gill slit well separated from the 4^a. Gill arches connected by spongy, sieve like structure.
- Tail fin half-moon shaped. Caudal peduncle depressed.
- Broad and flattened head lacking lateral flaps of skin. Snout truncated.
- Eyes small, laterally situated with small spiracles behind.
- Nostrils with rudimentary characteristic barbels. Mouth wide, terminal on head.
- ✓ Jaws having some 3,000 homodont, small and weak teeth.
- Pectoral fins very large, relatively narrow and falcate.

<u>Distribution:</u> Circumglobal in tropical and warm temperate waters. Western Atlantic, Eastern Atlantic, Indo Western Pacific, Central Pacific and Eastern Pacific.

Remarks: Traded mainly for its meat, liver, fins, skin and cartilage. Small harpoon fisheries exist in India & Pakistan. It produces large quantity of liver oil. The whale shark meat is exported in frozen form mainly to Taiwan, Korea and Singapore. According to Marine Products Export Development Authority (MPEDA) fins of whale shark were exported from India to countries like China, Japan, Germany, Malaysia and Spain. The IUCN Red List considers this species as a Data Deficient Species. This filter-feeder species has now become vulnerable due to large-scale exploitation for trade.

KNIFETOOTH SAWFISH (FAMILY PRISTIDAE)

Scientific Name: Anoxypristis cuspidata (Latham) W(P)A-Schedule I
CITES-Not listed



Common Name: Knifetooth Sawfish/Narrow Sawfish/Pointed Sawfish

Identifying Features:

- ∠ Length 3.50m in Australia. Average length 5m.
- Body shark-like, dorsally grayish, ventral portion and fins pale in colour. Margin of fin and lateral fold of tail whitish.
- Head flattened with long narrow sawblade-like snout of uniform width bearing 16-35 pairs of rostral/lateral teeth.
- Rostral teeth flat, broadly triangular with a sharp posterior edge. Posterior margin without groove.
- Teeth absent on basal quarter of blade.
- Pectoral fins distinct. Tail with very strong lower lobe.
- Nostrils very narrow with small nasal flaps.
- Skin covered with widely spaced denticles in adults, completely naked in young.

Distribution: Indo Pacific region from the Red Sea to Japan, Southwards to Northern Australia and Gulf of Carpentaria.

Remarks: Benthopelagic marine species. Feeds on small fishes (mullet), crustaceans and squids. Mainly exploited for its flesh and liver oil in parts of Asia. The shark fin trade is affecting this and other pristid species. It is listed as vulnerable under the "Commonwealth Endangered Species Protection Act, 1992." According to the IUCN Red List it is an Endangered species.





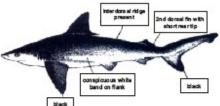
PONDICHERRY SHARK (FAMILY CARCHARHINIDAE)

Scientific Name:

Carcharhinus hemiodon (Muller & Henle)

W(P)A-Schedule I CITES-Not listed





Common Name: Pondicherry Shark

Identifying Features:

- Relatively small (1.50 2.00 m) requiem shark. Slender and fusiform body.
- Snout broadly rounded. Large, circular eyes.
- Teeth in numerous rows. Upper teeth triangular. Cusp of upper lateral teeth smooth edged or weakly serrated. Upper anterior teeth with narrow cusps. Teeth in lower jaw show erect narrow cusps.
- First dorsal fin large and falcate with narrow, distally pointed or rounded tips. Second dorsal fin high, with origin above or slightly posterior to the origin of anal fin.
- Large, falcate pectoral fins with narrowly rounded tips. Interdorsal ridge present between dorsal fins.
- Pectorals, second dorsal fin and dorsal and ventral lobe of the caudal fin black tipped, other fins dusky.
- Colour dark gray dorsally, white ventrally with white band on the flanks.

Distribution: Indo-WestPacific: India (including Andaman Islands), Sri Lanka, Madagascar, Thailand, Vietnam, Australia, Oman, Indonesia, New Guinea.

Remarks: Occurs inshore on continental and insular shelves. Feeds on small fish, cephalopods and crustaceans. These are targeted and fished for their liver and fins. The oil extracted from its liver has medicinal value. The populations are thought to have been severely depleted as a result of large-scale exploitation. Possibly endangered. Vulnerable as per IUCN Red List.

GANGES SHARK (FAMILY CARCHARHINIDAE)

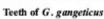
Scientific Name:

Glyphis gangeticus (Muller & Henle)

W(P)A-Schedule I CITES-Not listed

Synonym: Carcharias murrayi







Common Name: Ganges Shark

Identifying Features:

- Maximum length 2.20 m. Commonly 1.70 m.
- Moderately stout body. Eyes minute.
- Short, broadly rounded snout, length less than the mouth width equal to distance between nostrils. Small, wide spaced nostrils.
- Total tooth count 32-37(upper jaw) / 31-34(lower jaw). Total vertebral count 160. The number of teeth and vertebrae distinguish it from Glyphis glyphis.
- Cusp of lower teeth narrow, tall, erect and strongly hooked, protruding prominently when mouth is closed. Lower anterior teeth smooth. Upper teeth broad, triangular with serrated cusps.
- All fins plain, without dusky margin.
- Precaudal pit shallow, longitudinal rather than crescent shaped.
- Second dorsal fin height half that of 1st dorsal fin.
- Longitudinal depression on dorsal surface of caudal peduncle.
- Light brownish or gray brown above, light below.

<u>Distribution:</u> Indo-West Pacific: India (Hooghly-Ganges river system, West Bengal, Andaman Island), Sri Lanka, Madagascar, Thailand, Vietnam, Java, Australia, Red sea, East coast of Africa.

Remarks: Critically Endangered species as per IUCN Red List. It is a freshwater species, possibly estuarine. Traded mainly for its liver. Crude oil is extracted from its liver.



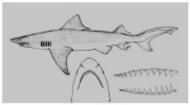


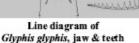
SPEARTOOTH SHARK (FAMILY CARCHARHINIDAE)

Scientific Name:

Glyphis glyphis (Muller & Henle)

W(P)A-Schedule I CITES-Not listed







Common Name: Speartooth Shark

Identifying Features:



Teeth of Clyphis glyphis

- Snout broadly rounded, short. Preoral snout much shorter than mouth width but preorbital snout rather lung.
- Total tooth count 14/14. Upper teeth with high, broad, serrated, triangular cusps. Lower anterior teeth with long, hooked, protruding cusps having unserrated tips.
- First dorsal fin origin over rear ends of pectoral bases.
- Second dorsal fin height 3/5 that of 1st dorsal fin.
- No interdorsal ridge.
- Upper precaudal pit longitudinal, no conspicuous markings.

Distribution: India, New Guinea, Borneo, Australia.

Remarks: Probably feeds on small fishes. Habitat mainly inshore, possibly freshwater. It is known only from the stuffed holotype (original specimen), collected in the early 19th century and now appears to be lost. Endangered as per IUCN Red List.

GANGES STINGRAY (FAMILY DASYATIDAE)

Scientific Name:

Himantura fluviatilis (Hamilton - Buchanan)

W(P)A-Schedule I CITES-Not listed

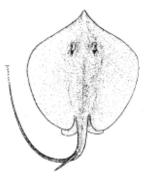
Common Name: Ganges Stingray

Identifying Features:

- Oval shaped, flat, disc-like body. Disc width approximately 1 meter in adults.
- Narrowly triangular snout of length less than one-third of disc length.
- Dorsal surface of disc more or less uniformly covered with small, blunt denticles.
- Whip-like, long tail with two or three functional stings.
- Dorsal surface plain grayish, ventral surface white with broad dark margin.
- Tail long, slender, blackish

Distribution: India and Bangladesh: Gangetic river system, possibly in Bay of Bengal. Indonesia, Papua New Guinea, South Africa, Thailand.

Remarks: Mainly a freshwater species, restricted to the Ganges river system. Threatened mainly by water pollution and habitat degradation. It is extremely vulnerable to fisheries and virtually all known populations have experienced very serious declines. It is listed as Endangered species in the IUCN Red List.



Himantura sp. (Line diagram)





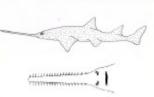
LARGE TOOTH SAWFISH (FAMILY PRISTIDAE)

Scientific Name: Pristis microdon (Latham)

W(P)A-Schedule I CITES-Not listed







Dorsal Side Ventral Side Line diagram
Common Name: Large Tooth Sawfish, Win, Nali, Sondel, Khandere,
Komben - Sorrah

Identifying Features:

- Maximum length 6.56 m, weight 600 kg.
- Dorsal and anal spine absent.
- Body heavily built with a short but massive, broad based and strongly tapering saw. 14-23 pairs of very large rostral teeth present on saw.
- Rostral teeth awl-like, with concave groove on posterior edge. Space between last 2 saw teeth on sides less than 2 times space between first 2 teeth.
- Pectoral fins high and angular.
- 1 dorsal fin starts well ahead of pelvic fins.
- Caudal fin with a distinct lower lobe.
- Olive greenish, gray or golden brown dorsally. Ventral side dirty cream coloured.

<u>Distribution:</u> Indo-West Pacific: East Africa to New Guinea, North to the Philippines and Vietnam, South to Australia, also Atlantic and Eastern Pacific.

Remarks: It is a benthic species. Found in estuaries, lagoons but also entering freshwater, usually found in turbid channels of large rivers over soft mud bottoms. This species is commercially important as liver oil is extracted from its liver. The crude liver oil bears stearin. The population is seriously declining due to large-scale exploitation for trade and also habitat loss. It is listed as an Endangered species in the IUCN Red List.

LONG COMB SAWFISH (FAMILY PRISTIDAE)

Scientific Name: Pristis zjisron (Bleeker)

W(P)A-Schedule I CITES-Not listed





Ventral Side

Dorsal Side

Common Name: Large Comb Sawfish / Green Sawfish

Identifying Features:

- Enlarged denticles along median keels of back and along fins.



Line diagram

- First dorsal fin begins slightly behind pelvic fins.
- Durk greenish gray to blackish brown dorsally. White to yellowish ventrally.

Distribution: Indo-West Pacific: Red Sea and East Africa to Papua New Guinea, North to Southern China, Australia.

Remarks: It is an inshore and intertidal species. Inhabits mud and sand but occasionally enters estuaries and ascending rivers. It is a benthic species, found in shallow bays and lagoons. Feeds on small fishes. The flesh is considered tasty. But it is not an abundant species and is commercially unimportant too. In IUCN Red List it is listed as an Endangered Species.



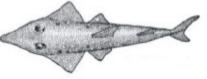
GIANT GUITARFISH (FAMILY RHINOBATIDAE)

Scientific Name:

Rhynchobatus djiddensis (Forsskal)

W(P)A-Schedule I CITES-Not listed





Line diagram

Common Name: Giant Guitarfish / White Spotted Shovel Nosed Ray, Ranja, Ulavi, Tipi-ulavi, Walahtenkee, Nulu-navi, Kachu-Uluwai, Ettiballiar, Varithalai

Identifying Features:

- A characteristic black cross present between the eyes.

Jaw of R. Djiddensis

- ∠ Dorsally olive-green, with numerous white spots. Ventrally white.
- Two large dorsal fins and a large scythe like (sickle shaped) tail present. Lower portion of the caudal lobe is short.
- Teeth flattened and pavement like, with smooth and prominent transverse ridges.

<u>Distribution:</u> Western Indian Ocean, restricted to the Red Sea and the tropical Western Indian Ocean to South Africa. Also Egypt, Indonesia, Madagascar, Oman, Seychelles, Somalia, East coast of Africa.

Remarks: Reef associated marine species. Feeds on crabs, lobsters, clams and small fishes. Its fins are in high demand in the Asian markets. Actually these yield the highest value fins in the world, with about \$ 90 per kg paid to fishermen in Indonesia. It is an important target in retained bycatch and directed fisheries throughout its range. Listed as a Vulnerable species in the IUCN Red List. It is a common aquarium fish also. It's meat is considered as world's finest quality shark meat.

PORCUPINE RAY (FAMILY DASYATIDAE)

Scientific Name:

Urogymnus asperrimus (Bloch & Schneider)



Common Name: Porcupine Ray / Thorny Ray

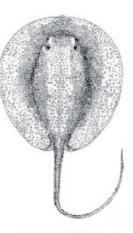
Identifying Features:

- Young with large flat denticles on upper surface.
- Large juveniles and adults with additional sharp conical thorns and small pointed denticles.
- Elongated, thick, disc-like body with broadly rounded outer corners.
- Snout broadly rounded and tail long, slender.

<u>Distribution:</u> Indo-Pacific: Red Sea and Malay Archipelago, East Coast of Africa.

Remarks: Reef associated marine species. Inhabits the continental shelf area. It is very difficult to handle and that is why it is probably of limited commercial value. In the IUCN Red List it is listed as a Vulnerable species.





Line diagram



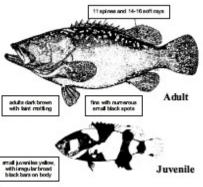


GIANT GROUPER (FAMILY SERRANIDAE)

Scientific Name:

Epinephelus lanceolatus (Bloch)

W(P)A-Schedule I CITES-Not listed



Line diagram



Epinephelus lanceolatus (Adult)



Epinephelus lanceolatus (Juvenile)

Common Name: Giant Grouper

Identifying Features:

- largest of all reef dwelling bony fish and predator.
- Adults dark brown with faint mottling
- There are many small black spots on the fins.
- ▼ Two dorsal or back fins. 1st dorsal fins have 11 spines and 14-16 soft.
- Caudal or tail fin, big, rounded, fan-like.

Distribution: Indo Pacific: Red Sea, Pacific Ocean north to Taiwan, South to Australia. Inhabits both lagoons and seaward reefs from depths of a few meters to 50 m or more.

Remarks: The population has been depleted severely nowadays as a result of trawling. They are sold as juveniles at times in the aquarium trade. Feed mainly consists of small sharks, rays, young sea turtles, fish of all sizes, crabs and spiny lobsters.

SEA HORSE (ALL SYNGNATHIDIANS)

[Syn-together or with; gnathos-jaw(Greek)]

W(P)A-Schedule I CITES-Appendix II

Identifying Features of Family Syngnathidae:

- Elongated semi flexible body with armoured, bony plates.
- Scales absent.
- Gill openings always reduced to a small round pore.
- Long and tubular head present in almost all species.
- Jaws fused. There is no hinge to open and close the jaw.
- Soft rayed fins present. Most species have one dorsal fin and pectoral fins. Some species have caudal fins. Some are entirely finless.
- ✓ Ventral and 2nd dorsal fin are absent in all the syngnathids.
- In all species, the male carries the eggs during incubation period and for this they have characteristic brood pouch at the base of the tail. The eggs are carried in the brood pouch till hatching.

Family Syngnathidae is divided into 4 subfamilies viz:

- Hippocampinae (Sea Horses);
- Solegnathinae (Sea Dragons);
- Syngnathinae (Pipefishes) &
- Doryrhamphinae (Flagtailed Pipefishes).
- 1) Subfamily Hippocampinae: All sea horses are included under this subfamily.

Scientific Name: Hippocampus spp.



Hippocampus kuda



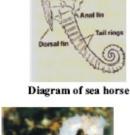
Hippocampus kelloggi



Hippocampus histrix



Long Snouted Sea-horse





Hippocampus trimaculatus



Hippocampus erectus





Identifying Features:

Head horse-like. Mouth toothless, suctorial. Snout tubular. Large plate-like operculum. Dorsal, pectoral and anal fins present; caudal fins absent. Dorsal fins beat 20-30 times per second. Tail prehensile.

Remarks:

Live in warm or temperate salt water. Not a great swimmer. Usually carried passively by water current. Feeds mainly on small crustaceans, brine shrimp, plankton and worms by means of sucking. Sea horses have great commercial value. In countries like China, Indonesia and Central Filipinos, the people use these in their medicines as cures for illnesses such as asthma, arteriosclerosis, incontinence, debility, kidney problems, sores, boils, thyroid disorders, skin ailments, broken bones and heart disease, as aphrodisiacs and as food. It is a good (ornamental) aquarium fish and is also stuffed to make decoration pieces. Earlier these have been exported every year to other countries like Singapore, Japan, etc. from India. A pair of live specimens costs upto Rs.3500-4000 (US \$ 70-100). Fishermen may earn Rs.10-15 per fish (dried sea horses) while the middlemen earn Rs.10000-12000 per kg. by exporting these. These species are extremely vulnerable and the populations are declining seriously.

 Subfamily Solegnathinae: Consists of Leafy sea dragons (LSD) and Weedy sea dragons (WSD).

<u>Scientific Name:</u> Phyllopteryx taeniolatus (WSD) & Phycodurus eques (LSD).



Phyllopteryx taeniolatus (WSD)



Phycodurus eques (LSD).

Identifying Features:

a) Weedy Sea Dragon (WSD)- Have weed - like projections on their body. These help in camouflaging. Reddish in colour with yellow purple markings. Length upto 46 cm. b) Leafy Sea Dragon (LSD) - Total length upto 35 cm. Pipe-like snout with terminal mouth. Long leaf-like protrusions all over the body serve as camouflage so that it does not look like fish. Transparent and small pectoral and dorsal fin, on ridge of neck and on the back near the tail respectively. Propulsion through fin not leafy protrusions.

Remarks:

Weedy sea dragons are marine fish, feed on tiny crustacea and other zooplankton. This species (WSD) has only been recorded from the southern coastline of Australia, from Kangaroo Island, South Australia to Rottnest Island, Western Australia. These fishes live over sand patches among kelp-covered rocks below the low tide line in depths from about 3-50 m. The Leafy sea dragon is a marine fish, generally remaining in shallow, temperate waters. They feed on plankton, algae and other small flotsam and are not preyed upon by any species other than humans. They have become endangered through pollution and industrial runoff as well as collection by fascinated divers who are entranced by their unique appearance. LSD are found in waters around southern and western Australia.

3) Subfamily Syngnathinae: Consists of Pipefishes.

Scientific Name: Total 42 genera. eg. Corythoichthys sp.









Corythoichthys sp.

Identifying Features:

Snout peculiar and like long tube. Body long, thin and snake like. Dermal skeleton having several longitudinal ridges. Dorsal fin always present and is principal organ of locomotion. Ventral fin consistently absent. Gill openings extremely small. Less than 20 cm in length.

Remarks:

Generally inhabit sheltered areas in coral reefs, seagrass beds and sandy



lagoons. Abundant on corals of the tropical and temperate zones. They are very bad swimmers, slowly moving through the water by means of the rapid movement of the dorsal fin. Their tail is prehensile as in sea-horses.

4) Subfamily Doryrhamphinae: Consists of flagtailed pipefishes.

<u>Scientific Name:</u> Doryrhamphus, Dunkerocampus, Heraldia and Maroubra, etc.





Dunkerocampus sp.





Doryrhamphus sp.

Identifying Features:

Caudal fin abnormally large and looks like flag. Flagtailed pipefishes have very striking color patterns like bands or stripes on their body and spots or stripes on the fanlike tail.

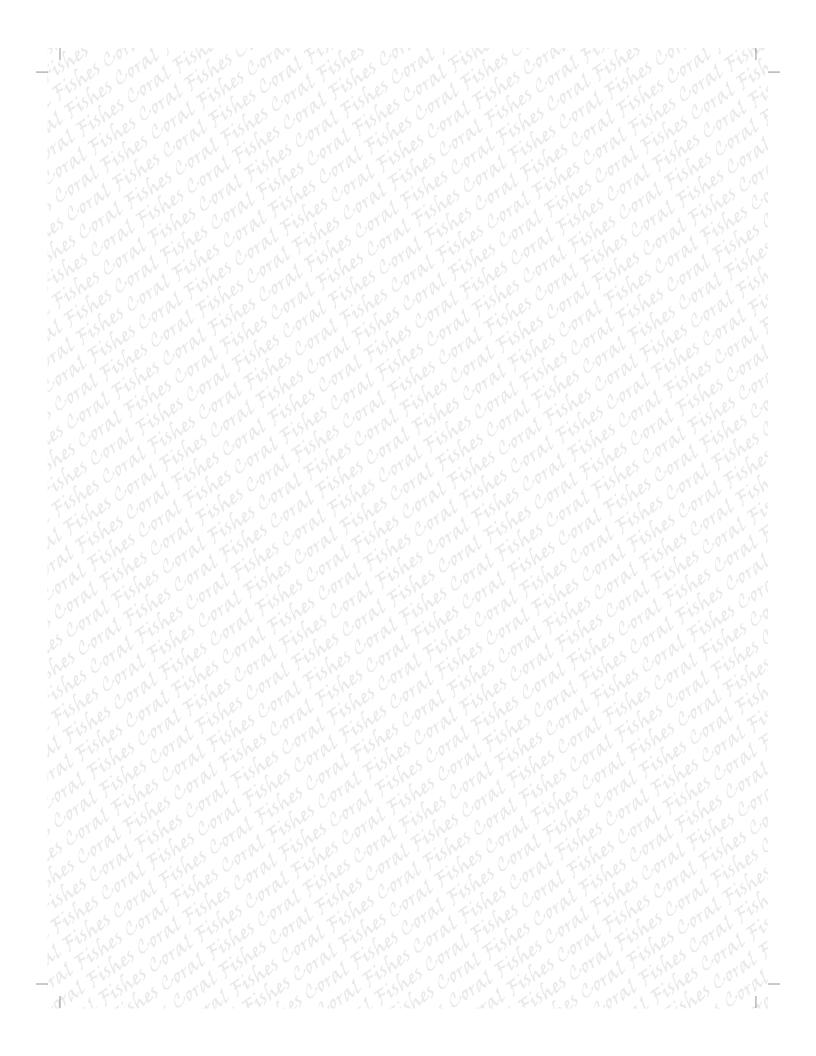
Remarks:

Some pipefish clean other animals (like cleaner wrasses). Live in Indowest pacific region.

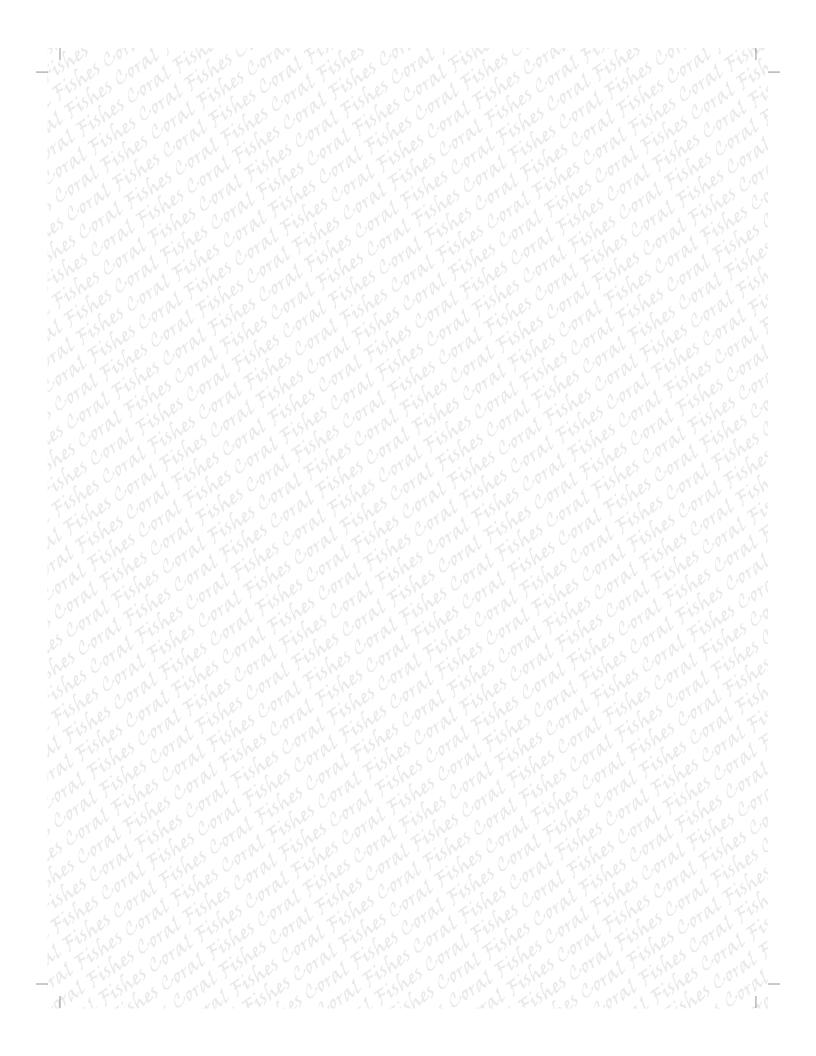
GLOSSARY

- Barbels Finger shaped tactile appendages arising from jaws.
- Benthic Sedentary animals & plants living on the sea bottom.
- Benthopelagic Sedentary animals/plants living on the surface as well as at the bottom of the sea.
- Caudal peduncle Region anterior to the caudal fin.
- Cephalopods A class of bilaterally symmetrical marine molluscs.
- CITES Convention on International Trade in Endangered Species of Wild Fauna and Flora.
- Crustaceans One class of Arthropoda, mostly of aquatic habits (eg. Prawns, Shrimps, Lobsters, Crabs, etc.)
- Denticle Any small tooth-like structure/Placoid scale of selachii.
- Dorsal Back of any part /body.
- Dorsal fin Fin on the back side of a fish.
- Gill arches In fish the incomplete jointed skeletal ring supporting a single pair of gill slits.
- Gill slits In chordata, the openings leading from the pharynx to the exterior, on the walls of which the gills are situated.
- Homodont Set of teeth which all have the same characteristics.
- IUCN International Union for Conservation of Nature and Natural Resources.
- MPEDA Marine Products Export Development Authority.
- Operculum Covering of gill slits in bony fishes.
- Pectoral fin Anterior pair of fins in fish.
- Pelvices Bony or cartilaginous structure in vertebrates to which the posterior limbs are attached.
- Piankton Animals/plants often minute and unicellular, floating in waterbodies.
- Precaudal Anterior to the caudal portion.
- Prehensile Adapted for grasping.
- Preorbital A membrane bone situated in front / anterior to the orbit, in some fish.
- Rostral teeth Teeth on the rostrum of a sawfish.
- Snout Projecting nose and mouth of an animal.
- Spiracles Modified slit located just behind the eye.
- Squids A type of Mollusca (eg. Sepia, Loligo, etc./also known as cuttle fish)
- Subcaudal Posterior to the caudal portion.
- Ventral Anterior or front part or underside of a body.
- W(P)A -Wildlife (Protection) Act 1972.





CORAL FISHES



INTRODUCTION

Trade in captive bred fresh water and marine ornamental fishes have been taking place since long. Changing lifestyle with the opening of economy appears to have led to an increase in the demand not only in terms of quantity but also in terms of the diversity of species. Available intelligence suggests increasing demand for coral reef fishes both in the domestic and international markets.

Coral reef fishes are not listed in the schedules of Wild Life (Protection) Act, 1972 and hence are not bestowed with protection from unauthorized collection, possession and trade. Consequently trade especially the more lucrative and hence more deleterious from species survival perspective international trade also is not covered under the export policy.

In the present situation only the collection from the notified marine national park/sanctuary alone are prohibited. Given the fact that the reef area under the notified park/sanctuary is limited, the collection from adjoining/other unprotected area cannot be regulated. Any such uncontrolled unscientific demand driven harvest would lead to long term irreversible negative effects at the population level threatening the survival of the species.

In this regard, a scientific study to understand the change in the population dynamics of reef fishes over a period of six years in the Gulf of Mannar National Park, indicates significant decline in the population of several species of reef fishes rom 2002 which were common(>20/300m² using 30m belt transect of Fowler, 1987) Rare(2-4/300 m²) or highly threatened(0-1/300 m²) in 2008. Available intelligence also suggests the increased spotting of many of these species in domestic ornamental fish trade as well as in the exports of ornamental fishes during the period.

The Bureau on careful examination of the scientific and intelligence information available to it and in the light of precautionary principle, considers that an urgent need has arisen to regulate the collection, possession and trade in the following species of coral reef fishes by listing them under Schedule IV of the Wildlife(Protection) Act, 1972 by amending the Schedules to that effect u/s 62 of the Act.

The move would provide a preliminary cover as a first step to the species irrespective of its existence within the precincts of a sanctuary/national park, while would generate more objective data on the extent of domestic trade and captive breeding operations if any, through a proper regulatory regime determined by the Chief Wildlife Wardens.

Pending the amendment of the schedules, need has also arisen to put the species under watch list at the exit points so as to generate data on the extent of external trade in the species for consideration of such appropriate and further measures as may be necessary.









Common Name : Africana coris Scientific Name : Coris cuvieri

Status in 2002 : Rare

Status in 2008 : Highly Threatened

Common Name : Argus grouper Scientific Name : Cephalopholis argus

Status in 2002 : Rare

Status in 2008 : Highly Threatened

Common Name : Banded goby

Scientific Name : Amblygobius phalaena

Status in 2002 : Common Status in 2008 : Rare

Common Name : Bird wrasse

Scientific Name : Gomphosus varius

Status in 2002 : Common Status in 2008 : Rare









Common Name : <u>Bleekeri hawkfish</u> Scientific Name : Cirrhitichthys bleekeri

Common

Status in 2008 : Rare

Status in 2002

Common Name : Blue – blotch butterfly Scientific Name : Chaetodon plebeius





Common Name : <u>Blue and yellow grouper</u>

Scientific Name : Epinephelus flavocaeruleus

Status in 2002 : Rare

Status in 2008 : Highly Threatened

Common Name : Blue/Green Reef Chromis Scientific Name : Dascyllus trimaculatus

Status in 2002 : Common Status in 2008 : Rare

Common Name : Blue line grouper Scientific Name : Cephalopholis formosa

Status in 2002 : Common

Status in 2008

Common Name : Blue ring Angle

Scientific Name : Pomacanthus annularis

Rare

Status in 2002 : Common Status in 2008 : Rare









Common Name : Blue streak cleaner wrasse

Scientific Name: Labroides dimidiatus

Status in 2002 : Common Status in 2008 : Rare

Common Name: Broadfin moray eel

Scientific Name: Gymnothorax pseudothyrsoideus







Common Name : Chevron butterfly Scientific Name : Chaetodon xanthurus

Status in 2002 : Common Status in 2008 : Rare

Common Name : Clown tang

Scientific Name : Acanthurus lineatus

Status in 2002 : Rare

Status in 2008 : Highly Threatened

Common Name : Convict tang

Scientific Name : Acanthurus triostegus

Status in 2002 : Common Status in 2008 : Rare

Common Name : Coral cat fish Scientific Name : Plotosus lineatus

Status in 2002 : Rare

Status in 2008 : Highly Threatened









Common Name : Diana's hogfish Scientific Name : Bodianus diana Status in 2002 : Common Status in 2008 : Rare

Common Name : Diana's hogfish
Scientific Name : Podianus diana
Status in 2002 : Common
Status in 2008 : Rare





Common Name : Eight band butterfly Scientific Name : Chaetodon octofasciatus

Status in 2002 : Common Status in 2008 : Rare

Common Name : Falcula butterfly Scientific Name : Chaetodon falcula

Status in 2002 : Common Status in 2008 : Rare

Common Name : Freckled hawfish Scientific Name : Paracirrhites forsteri

Status in 2002 : Common Status in 2008 : Rare

Common Name : Green birdmouth wrasse

Scientific Name : Gomphosus caeruleus

Status in 2002 : Common Status in 2008 : Rare







Common Name : Green Razor Fish
Scientific Name : Xyrichtys splendens

Status in 2002 : Rare

Status in 2008 : Highly Threatened

Common Name : Honeycomb eel

Scientific Name : Gymnothorax favagineus







Common Name : Humbug damsel Scientific Name : Dascyllus aruanus

Status in 2002 : Common Status in 2008 : Rare

Common Name : Indian yellow tail angel Scientific Name : Apolemichthys xanthurus

Status in 2002 : Rare

Status in 2008 : Highly Threatened

Common Name : Koran angel

Scientific Name: Pomacanthus semicirculatus

Status in 2002 : Rare

Status in 2008 : Highly Threatened

Common Name : Lined Butterfly Scientific Name : Chaetodon lineolatus

Status in 2002 : Common Status in 2008 : Rare









Common Name : Melon butterfly Scientific Name : Chaetodon austriacus

Status in 2002 : Common Status in 2008 : Rare

Common Name : Moon wrasse

Scientific Name : Thalassoma lunare





Common Name : Mustache trigger fish Scientific Name : Balistoides viridescens

Status in 2002 : Common Status in 2008 : Rare

Common Name : Ornate goby Scientific Name : Istigobius ornatus

Status in 2002 : Common Status in 2008 : Rare

Common Name : Powder Blue tang

Scientific Name : Acanthurus leucosternon

Status in 2002 : Rare

Status in 2008 : Highly Threatened

Common Name : Queen Coris Scientific Name : Coris formosa

Status in 2002 : Rare

Status in 2008 : Highly Threatened









Common Name : Raccoon butterfly Scientific Name : Chaetodon lunula

Status in 2002 : Common Status in 2008 : Rare

Common Name : Ring tail surgeonfish Scientific Name : Acanthurus blochii





Common Name : Sargasium Fish Scientific Name : Histrio histrio

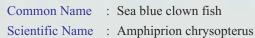
Status in 2002 : Rare

Status in 2008 : Highly Threatened

Common Name : Sea anemone

Scientific Name : Stichodactyla haddoni

Status in 2002 : Common Status in 2008 : Rare



Status in 2002 : Common Status in 2008 : Rare

Common Name : Shortfin lion fish

Scientific Name : Dendrochirus brachypterus

Status in 2002 : Common Status in 2008 : Rare







Common Name : Sea urchin Scientific Name : Salmacis bicolor

Status in 2002 : Common Status in 2008 : Rare

Common Name : Silver moony/sea angle Scientific Name : Monodactylus argenteus







Common Name : Six bar wrasse

Scientific Name : Thalassoma hardwicke

Status in 2002 : Common Status in 2008 : Rare

Common Name : Spot tail butterfly

Scientific Name : Chaetodon ocellicaudus

Status in 2002 : Common Status in 2008 : Rare

Common Name : Spotted sharpnose puffer Scientific Name : Canthigaster punctatissima

Status in 2002 : Common Status in 2008 : Rare

Common Name : Spotted trunkfish Scientific Name : Lactophrys bicaudalis

Status in 2002 : Common Status in 2008 : Rare









Common Name: Srilankan dottyback Scientific Name: Pseudochromis dilectus

Status in 2002 : Common Status in 2008 : Rare

Common Name: Striped poison – Fang blenny

Scientific Name: Meiacanthus grammistes







Common Name: Striped sweetlips

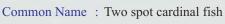
Scientific Name: Plectorhinchus diagrammus

Status in 2002 : Common Status in 2008 : Rare



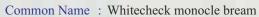
Common Name: Three Spot damsel Scientific Name: Dascyllus trimaculatus

Status in 2002 : Common Status in 2008 : Rare



Scientific Name: Apogon maculatus

Status in 2002 : Common Status in 2008 : Rare



Scientific Name: Scolopsis lineata

Status in 2002 : Common Status in 2008 : Rare









Common Name : Yellow-head butterfly Scientific Name: Chaetodon xanthocephalus

Status in 2002 : Common Status in 2008 : Rare

Common Name : Yellow tail blue damsel Scientific Name : Chromis xanthura





Common Name : Yellow tail damsel Scientific Name : *Chrysiptera parasema*

Status in 2002 : Common Status in 2008 : Rare

Common Name : Zigzag wrasse

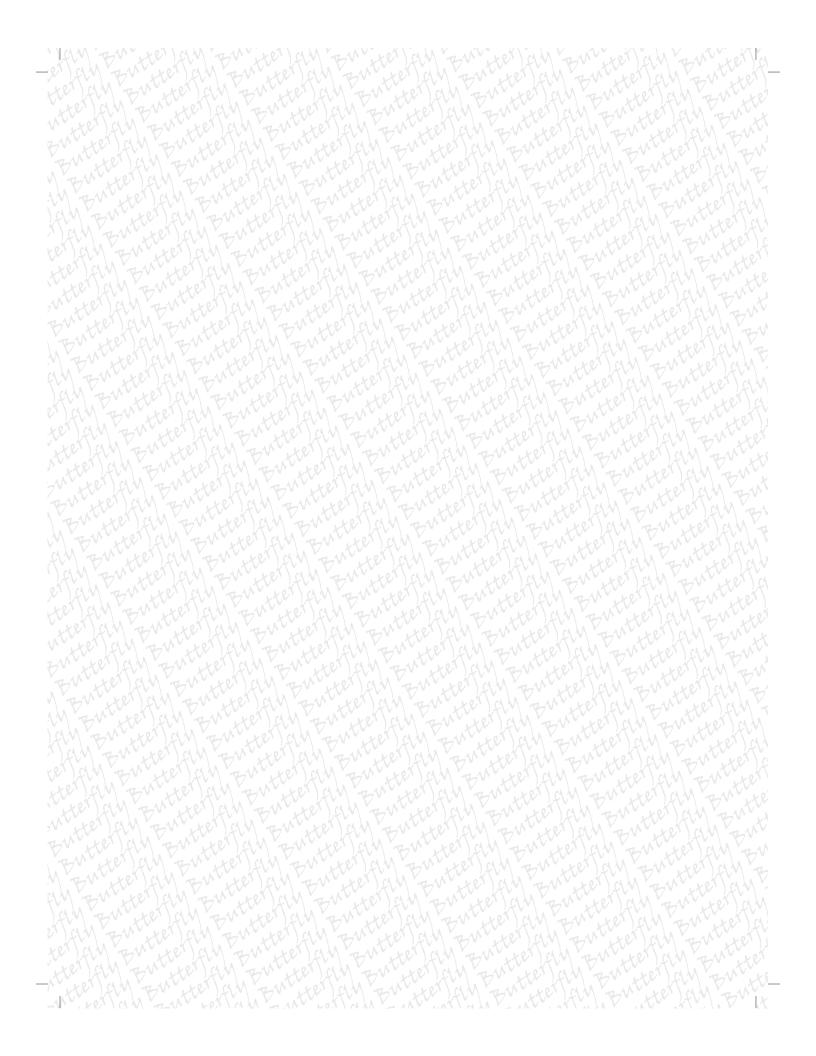
Scientific Name : Halichoeres scapularis





Butterfly





SUBJECT

Bhutanitis lidderdalei lidderdalei

Chilasa clytia clytia

Chilasa epycides epycides

Chilasa paradoxa telearchus

Chilasa slateri slateri

Graphium aristeus anticrates

Graphium arycles arycles

Graphium eurypylus macronius

Graphium evemon albociliates

Graphium gyas gyas

Graphium megarus megarus

Papilio bootes

Papilio buddha

Papilio elephenor

Papilio fuscus andamanicus

Papilio liomedon

Papilio machaon verityi

Papilio mayo

Parnassius acco gemmifer

Parnassius charltonius charltonius

Parnassius delphius

Parnassius epaphus hillensis

Parnassius hannyngtoni

Parnassius imperator augustus

Parnassius jackquemonti jackquemonti

Parnassius stoliczkanuss

Atrophaneura (= Polydorus) crassipes

Atrophaneura (= Polydorus) coon sambilana

Atrophaneura (= Polydorus) hector

Atrophaneura (= Polydorus) latreillei karna

Atrophaneura (= Polydorus) nevilli

Atrophaneura (= Polydorus) plutonius pembertoni

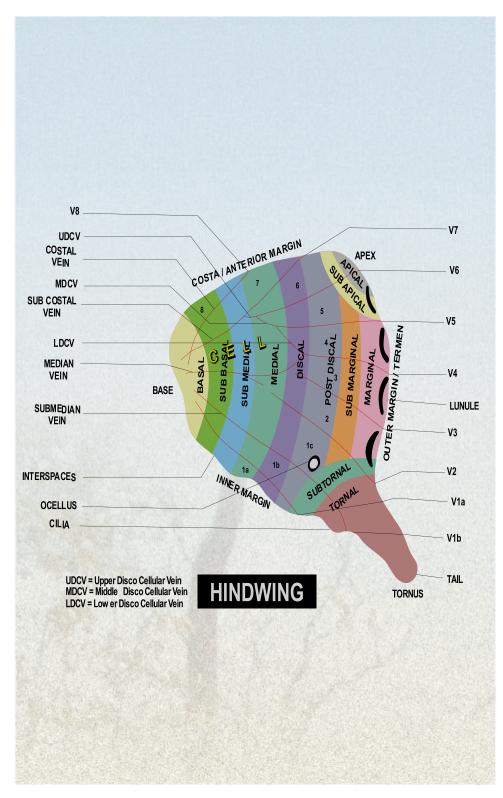
Atrophaneura (= Polydorus) tytleri

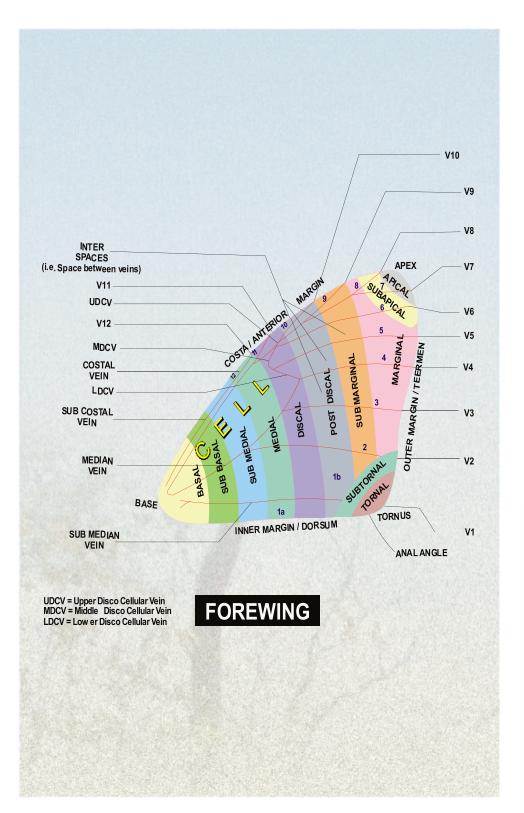
Atrophaneura (= Polydorus) polla

Teinopalpus imperialis imperialis













The Bhutan Glory.

Scientific Name: Bhutanitis lidderdalii lidderdalii Atkinson

Synonym: Armandia lidderdalei

Status: Rare

Wingspan: 90-110mm. **Identifying Features:**

- Upperside Blackish brown with long, yellowish white, narrow vertical lines. Wings are long
- HW Many-tailed, the one at V4 being the longest. Shorter at V2, V3 & V5.
- UpH Shows a large tornal red patch with 2-3 blue and white grey spots/ocelli on a black area. It is posteriorly yellow.

Photo Courtesy: BNHS Book Plate 10, Fig 8 (Box + Add antennae).

W(P)A-Schedule II (Part II) CITES - Appendix II



Bhutanitis lidderdalii lidderdalii

The Common Mime

Scientific Name: Chilasa clytia clytia f. commixtus (Rothschild)

Synonym: Papilio clytia ab. commixtus, Chilasa clytia f.

commixtus

Status: Endangered / Very Rare

form commixtus

Wingspan: 90-100mm **Identifying Features:**

FW Brownish black with faint Form clytia discal stripes. Several whitish yellow smaller spots towards the outer margin.

- HW Cell mostly brown black.
- Long discal internervular streaks present.
- Intraspecific Variation: Besides f. commixtus there are following five forms:

f. clytia (Linnaeus), f. casyapa (Moore), f. panope (Linnaeus), f.

dissimilis (Linnaeus), f. dissimillima Evans. The form commixtus differs from above forms by the UpH having long discal internervular streaks, but most part of the cell is brown-black. The form commixtus is considered intermediate between f. clytia and f. dissimilis having FW like the former & HW like the latter.

• (BOX + Photo of f. clytia and f. dissimilis had been changed from MGM Book with antennae, BNHS photos not used, f. commixtus full image created by adding another side)



form dissimilis

3. The Lesser Mime

W(P)A – Schedule II (Part II) CITES – Not Listed

Scientific Name: Chilasa epycides epycides (Hewitson)

Synonym: Papilio epycides, Chilasa curiatius

Status: Rare

Wingspan: 70-90mm. Identifying Features:

- Upperside Brownish with pale stripes.
- Females paler with larger markings.
- FW UpF Shows diffused, inwardly drawn apical spots. No black bar present across the cell
- One row of grey white spots present in terminal portion.
- HW UpH Two rows of grey white spots in terminal portion.
- Prominent yellow tornal spot present.
- UNH Termen and costal margin upto subcostal vein dark.



Chilasa epycides epycides

4. The Great Blue Mime

Scientific Name: Chilasa paradoxa telearchus (Hewitson)

Synonym: Papilio paradoxa telearchus Hewitson

Status: Rare

Wingspan: 120-150mm Identifying Features:

- FW UpF Glossed with blue in male. Spot in apex of cell.
- In typical form a characteristic row of elongate discal bluish spots and almost whitish blue submarginal spots present.





Male Upperside



Female Upperside

- UnF Pale brown with submarginal spots.
- HW UpH Dark brown blue shot.
- Regular row of submarginal whitish spots.
- UnH white submarginal spots seen but yellow terminal spots absent.

Intraspecific Variation: In females, wings show white-grey stripes in addition to the spots of the male. Male mimics several forms of the genus

Euploea. Dimorphic form UpF has white end cell and white discal spots while UpH has white, black-veined basal half.





5. The Blue Striped Mime

W(P)A Schedule II (Part II) CITES Not Liste

Scientific Name: Chilasa slateri slateri (Hewitson)

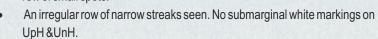
Synonym: Chilasa jaintinus

Status: Rare

Wingspan: 100-120mm/80-100mm.

Identifying Features:

- FW UpF Blackish brown, blue spot at end cell.
- Bluish-white discal stripes almost upto termen.
- HW Chestnut brown, with a row of submarginal lunular spots.
- UpH Small prominent yellow tornal spot.
- A pale discal area and post discal area showing a row of small spots.





Chilasa slateri slateri

6. The Chain Swordtail

Scientific Name: Graphium aristeus anticrates

(Doubleday)

Synonym: Pathysa aristeus anticrates

Status: Rare

Wingspan: 70-80mm. **Identifying Features:**

FW Cream coloured UpF



W(P)A Schedule II (Part II) CITES Not Listed



Male Upperside rounded spots as in Spot swordtail) on the dark margin.

- HW UpH No continuous central dark band.
- Dark margin with submarginal lunules.
- UnH Shows central dark band with red spots.
- Male With woolly scent folds.

A pale green submarginal regular chainline spots (not

7. The Spotted Jay

Scientific Name: Graphium arycles arycles

(Boisduval).

Synonyms: Zetides arycles, Papilio arycles

Status: Rare

Wingspan: 70-80mm7 Identifying Features:

FW UpF Black with small, bright green markings.



Male Underside

 HW UpH Cell dark with 2 green smaller s p o t s .

Markings bright green.

• UnH Costal bar red centred. Discal spots red.

W(P)A Schedule II (Part II) CITES Not Listed



Male Upperside

8. The Great Jay

Scientific Name: Graphium eurypylus macronius (Jordan)

Synonyms: Zetides eurypylus macronius

Status: Rare

Identifying Features:

 FW UnF 2 submarginal spots in area 7 separate (not conjoined as in Graphium eurypylus cheronus)

 HW UpH Bands above very broad and no dark veins on the band.

• UnH Apale spot on base 3.

W(P)A Schedule II (Part II)
CITES Not Listed



Graphium eurypylus macronius



The Lesser Jay

W(P)A Schedule II (Part II) CITES Not Listed

Scientific Name: Graphium evemon albociliatis (Fruhstorfer).

Synonyms: Zetides evemon albociliatis

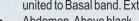
Status: Rare

Identifying Features:

FW UpF Only one submarginal spot in 1b. A spot near base 5 also.



- HW UnH Costal bar red centred and united to Basal band. Extreme end cell red.
- Abdomen Above black.



In male scent wool forms a narrow stripe



Female Upperside



Female Underside

10. The Brown Gorgon

Scientific Name: Graphium gyas gyas Westwood. Synonyms: Meandrusa gyas gyas, Meandrusa lachinus.

Status: Rare

Wingspan: 105-115mm. **Identifying Features:**

Underside Basal 1/4 dark chocolate-brown.



Male Underside

 Upperside Dark brown with yellow submarginal spots

Apex produced.

W(P)A Schedule II (Part II) CITES Not Listed



Male Upperside

- FW In female broad discal white band, interrupted beyond end cell.

11. The Spotted Zebra

W(P)A Schedule II (Part II) CITES Not Listed

Scientific Name: *Graphium megarus megarus* (Westwood). **Synonyms:** *Paranticopsis megarus megarus, Papilio megarus.*

Status: Rare

Identifying Features:

- Upperside Black with white streaks & spots.
- FW UpF Cell with three obliquely transverse streaks in the middle and two spots at apex.
- Cell spots very small. Two slender streaks in area 1 and broader streak in area 2.
- Above these a series of small spots and a complete submarginal series of spots.
- UnF Cell spots nearly absent
- HW UpH Discal streaks in area 3, 4 & 5 divided into small spots. All pale markings very small. A submarginal series of lunules.
- Female Ground colour duller.



Graphium megarus megarus (Male Upperside)

W(P)A Schedule II (Part II)

CITES Not Listed

Upperside

12. The Tailed Redbreast

Scientific Name: Papilio bootes Westwood

Status: Rare

Wingspan: 108-133mm.
Identifying Features:

- Upperside Black in males.
- FW Pale internervular streaks not reaching the terminal margin.
- HW Area 3 & 4 with elongate oval white spots at their bases.



Underside

A red spot at tornus and at apex of area 2.

- Whitish spots sprinkled with a few red scales at the apex of area 3.
- Tail spatulate.
- Underside Similar, markings as on upperside but the base of wing dark red, the tornal red spot with a broader lunular mark above it and similar lunules above the admarginal Spots.

Female Similar that of

male but with an additional white spot in interspace 2 forming the medial white patch.

 The red at base of wings more extended, the post discal lunular spots larger.



1. HW Papilio bootes Male, 2. HW Papilio bootes janaka Male





13. The Malabar Banded Peacock

W(P)A Schedule II (Part II)
CITES Not Listed

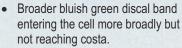
Scientific Name: Papilio buddha Westwood.

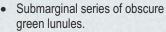
Status: Rare

Wingspan: 90-100mm Identifying Features:

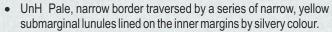
- FW UpF Broad bluish green discal band which enters the cell extensively.
- Basal area dusted with green scales.
- UnF Apical half pale brownish white darkening towards apex and narrowly around termen. Broad, post-discal grey band.
- HW UpH Yellow spot on costal margin towards apex and a

similar lunular yellow mark at the tornal angle.









Outer marginal areas & tail are black.



Papilio buddha

14. The Black Crested Spangle

CITES Not Listed Scientific Name: Papilio elephenor Doubleday

Synonyms: Pangeranopsis elephenor, Papilio (Pangeranopsis) elephenor, Papilio elephenor elephenor, Papilio elephenor.

Status: Endangered Wingspan: 110-138mm. Identifying Features:

Papilio buddha



Female Underside

General Character Head yellow, ground colour black.

FW Cellular and internervular streaks



W(P)A Schedule I

Male Upperside

irrorated (covered with minute grains, appearing like fine sand) with brilliant green scales, postero distally with wooly scent streaks.

• HW Tailless elongate, irrorated with brilliant blue & green scales.

- Tornus with a small claret red patch touched with violet and with a black spot.
- UnH With a double row of claret red submarginal lunules irrorated with violet.
- Abdomen Laterally buff coloured.

15. The Andaman Helen

Scientific Name: Papilio fuscus andamanicus (Rothschild).

Status: Rare

Wingspan: 105-115mm. **Identifying Features:**



Male Underside

W(P)A Schedule II (Part II) CITES Not Listed



Male Upperside

W(P)A Schedule I CITES Not Listed

16. The Malabar Banded Swallowtail

Scientific Name: Papilio liomedon Moore.

Synonym: Arominta liomedon, Papilio demolion race liomedon.

Status: Endangered Wingspan: 90-115mm **Identifying Features:**

Upperside Brownish black.

Wings Crossed by a creamy yellow/whitish band running from the apex of the FW to the middle of the

> dorsum of HW. (Underside similar to upperside)

HW UpH Discal white

UnH Complete series of blue lunules beyond the

patch in area 4-7.

white patch.



Male Upperside



Female Upperside

 FW The band is consisting of several separated spots diminishing in size towards apex. The band is contiguous with that in FW but in coalesced spots through the cell.

 HW - UpH Submarginal series of greenish yellow lunules with spot at tornal angle tinged pinkish brown; end cell on center of discal band.

UnH Shows evenly powdered scales.



17. The Common Yellow Swallowtail

Scientific Name: Papilio machaon verityi (Fruhstorfer).

Synonyms: Papilio birmanicus

Status: Rare

Wingspan: 80-100mm (Papilio machaon)

Identifying Features:

- Upperside Darker yellow.
- Lower disco-cellular vein and middle disco-cellular vein broad black.
- Discal band still further from end cell.



Male Underside

W(P)A Schedule II (Part II) CITES Not Listed



Male Upperside

- HW UpH Tornal red spot very large and not black edged below.
- In both sexes HW have a pair of protruding tails.
 - Intraspecific Variations: Three sub species of P. machaon found in India. Discal band broad near end cell in P. m. asiatica, further in P. m. sikkimensis and still further in P. m. Verityi.

The Andaman Mormon

Scientific Name: Papilio mayo (Atkinson). Synonyms: Papilio decurio. Princeps mayo.

Status: Not Rare Wingspan: 120-150mm. **Identifying Features:**

- Upperside Rich velvety black.
- FW Submarginal series of greenish-yellow irrorated internervular streaks, sometimes very faint.
- Dark red streak at base. Submarginal internervular streaks

as on the the upperside but grey and more prominent.



W(P)A Schedule II (Part II)

CITES Not Listed

Male Upperside



Female Upperside

HW - UpH A broad discal pale blue band, composed of broad outwardly more or less emarginate streaks in interspaces 1 to 7.4 or 5 small patches of dark red at base, a complete dark red ocellus in interspaces 1 and 2 and indistinct submarginal very variable markings of red in the other interspaces sometimes formed into half ocelli in interspaces 3 and 4; within this line of markings there is an incomplete discal lunular series of mixed red and blue scaling.

- UnH Opaque blue-black.
- Intraspecific Variations: Male tailless. Female tailed, closely resembles tailed form of the Female of Papilio memnon race agenor, but on the disc of the fore wing the internervular broad pale streaks are nearly white, and on the hind wing the white streaks in the interspaces beyond and outside the cell shorter and strongly tinged with red along their edges, while the dark red is more extended, especially in the tornal area where it covers the terminal three-fourths of interspaces 1 and 2, interrupted in 1 by a comparatively round oval black spot and in 2 by a broad elongate black patch; apical half of tail vermilion-red, whitish at apex.

The Varnished Apollo

Scientific Name: Parnassius acco gemmifer Fruhstorfer.

Status: Critically Endangered Wingspan: 40-65mm.

Identifying Features:

Upperside Grayish white.

- Marginal borders darker.
- FW UnF Unusually sharp white submarginal spots. Veins especially V2, V3 & V4 broadly black.
- HW Ocelli deeper red and more broadly ringed with black.
- UpH Prominent red spot on 5, mid 7, base 7 and a black spot between the latter two.



Spot in 5 joined to dorsum by a black band and usually a black spot between 5 & 7. Submarginal spots prominent, well separated, margin narrowly black.

- UnH A varnished yellow appearance concealing the basal red spots except that in area 7.
- Intraspecific Variations: There are three other subspecies of Parnassius acco, viz.

Parnassius acco acco, Parnassius acco tagalangi & Parnassius acco pundjabensis. Parnassius acco gemmifer differs from all the above three subspecies by wing markings darker and strongly developed and also maximum wing expanse of 65mm





The Regal Apollo

W(P)A Schedule II (Part II) **CITES Not Listed**

Scientific Name: Parnassius charltonius charltonius Gray

Synonyms: Parnassius atrogutta, Parnassius haudei, Parnassius accidentalis, Parnassius

bryki, Parnassius deckerti, Parnassius ducalis.

Status: Rare

Wingspan: 80-90mm. **Identifying Features:**

FW V6 & V7 well separated at the origin.

UpF Discal band usually broadened below cell, bases 2 & 3 usually entirely black. No red Spot.

HW UpH No spot in base 7, small red or black spot in mid Parnassius charltonius 7, very large usually white centred red spot extending from V4-V6, and a red or black basal bar in 1-2 (= 1a + 1b + 1c + 2).

- Complete row blue centred black submarginal spots on a dark ground, margin narrowly Dark.
- UnH Red basal spots obscure. In female pouch very large, cornuted.

The Banded Apollo

Scientific Name: Parnassius delphius Eversmann.

Synonyms: Doritis delphius.

Status: Vulnerable Wingspan: 55-65mm. **Identifying Features:**

FW UpF Without red spot at base of area 6.

- HW The discal ocellus placed either mid-way between submarginal line and cell/nearer the cell.
 - Subcostal ocelli often present.
 - UnH Red basal spots obsolete.
 - P. delphius (Upperside Female Like male, female pouch forms a belt round the abdomen and is prolonged below the bifid lobe and provided with a deep longitudinal groove.
 - Intraspecific Variations: Highly variable species and with following subspecies:

P. delphius ladakensis, P. delphius mamaievi, P. delphius rupshuana, P. delphius lampidius, P. delphius lathonius, (etc).



P. delphius Underside

W(P)A Schedule I CITES Not Listed



22. The Common Red Apollo

W(P)A Schedule II (Part II)
CITES Not Listed

Scientific Name: Parnassius epaphus hilliensis Bang Hass

Synonyms: Parnassius epaphus nirius, Parnassius epaphus cachemiriensis, Parnassius epaphus impunctata, Parnassius epaphus bashahrecus.

Status: Vulnerable Wingspan: 50-60mm. Identifying Features:

Superficially this form closely resembles *Parnassius jacquemontii*. In female pouch not keeled

• FW UpF In male crimson black- encircled spots reduced to a minute subcostal dot in the black mark beyond the cell.

 Termen subhyaline, much narrower, with dentate white spots in the interspaces along the actual margin.

- Cilia white and prominently chequered.
 Narrow vitreous dark marginal area.
- HW Dusky black along the dorsum comparatively much broader. Its inner border more irregular, deeply bi-



Parnassius epaphus

emarginate. Black mark above the tornal angle without crimson centre.

- Underside Glazed appearance as in P. jacquemontii; markings as on upperside except as
 follows: FW the white dentate spots in the terminal row are larger, which give to the wing the
 appearance of having a submarginal as well as a post-discal transverse series of dusky
 black lunules. HW Row of basal and the obliquely-placed pre-tornal spots are as in
 jacquemontii but of a duller shade, while as in that form all the crimson spots are broadly
 centred with white.
- Intraspecific Variations: Female differs from the male in the dusky black markings on the upperside that are broader, especially the postdiscal series on the fore wing: this generally forms a diffuse band and so often restricts the lunules of the white ground-colour beyond it, blending as it does diffusely with the subhyaline terminal margin.





The Hannyngton' Apollo

W(P)A Schedule I CITES Not Listed

Scientific Name: Parnassius hannyngtoni Avinoff.

Parnassius hunnyngtoni, Tadumia acco hannyngtone, Parnassius acco hunnyngtone, Parnassius acco hannyngtone.

Status: Critically Endangered Wingspan: 40-45mm.

Identifying Features:

- Small species with feeble markings. Very white upperside without red spots.
- FW Discal band complete/incomplete. Post discal band dark, submarginal spots white and marginal band dark all of equal width.



Female Upperside



Male Upperside

- V10 & V11 anastomosing, 10 & 7 well separated at base, 7 & 4 approximate, fringe pale yellow or white.
- HW Shows spots in area 4, middle of 6, and base of 6.
- Small and black discal band more or less continuous from vein 7 to inner margin. Basal black scaling very reduced.
- Submarginal spots small, well separated, with white
- · Female As male, female pouch resembles that of

Parnassius accobut shorter, not reaching so far round the upper part of the body.

Intraspecific Variation: The species known to exhibit little variation.

The Imperial Apollo

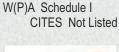
Scientific Name: Parnassius imperator augustus Fruhstorfer

Status: Critically Endangered Wingspan: 80-90mm. **Identifying Features:**

- Ground colour creamy white in males.
- FW Sharply defined black bands.



- HW Basal patch transparent, very large and
- Cell and sub-anal area with red pear-shaped spots.
- Red ocelli small, but broadly margined with black. Blue anal ocelli prominently white centred. Female As in male, Sphragis as in Parnassius delphius, but stronger and darker, with two pointed lobes.
- Intraspecific Variations: Only Indian subspecies showing little variation





25. The Keeled Apollo

W(P)A Schedule II (Part II) CITES Not Listed

Scientific Name: Parnassius jacquemontii jacquemontii Boisduval

Synonyms: Parnassius himalayensis, Parnassius rhodius.

Status: Not Rare Wingspan: 65-75mm. **Identifying Features:**

Large & often with black scaling.

Sometimes yellowish.

Intraspecific Variations: Another subspecies in India is P. j. Chitralensis, which is smaller and very white, with very little black scaling.



W(P)A Schedule I CITES Not Listed

26. The Ladak Banded Apollo

Scientific Name: Parnassius stoliczkanus Felder

Status: Vulnerable Wingspan: 50-59mm. **Identifying Features:**

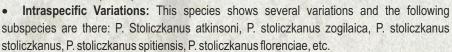
FW UpF Male without red spot in area 6.

- HW UpH Discal ocellus with a red centre and placed nearer to the marginal border than to the cell.
- Arow of 5 antemarginal ocelli or spots (dark blue to black

P. s. stoliczkanus (Male)

with a light blue centre) placed on the edge of black marginal border or within the

- Subcostal ocellus often absent.
- UnH With red basal spots obsolete.
- Female like male, pouch is small with two lobes that are more truncate than in Parnassius delphius.







P. s. stoliczkanus (Female)





The Black Windmill

W(P)A Schedule I CITES Not Listed

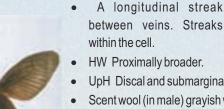
Scientific Name: Polydorus crassipes / Atrophaneura crassipes (Oberthuer)

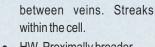
Synonyms: Papilio crassipes, Byasa crassipes, Tros crassipes, Polydorus crassipes. Status:

Endangered

Wingspan: 110-120mm. **Identifying Features:**

FW Sooty black with black veins.







Atrophaneura crassipes (Male)

- HW Proximally broader.
- UpH Discal and submarginal spots faintly red.
- Scent wool (in male) grayish white.
- Dull black. Large lunules; 2 anteroterminal, 2 subbasal & 1 irrergular anal lunule.
- Tail short, broad and tipped bright crimson.
- Female As in male but with narrower hind tibiae and
- Intraspecific Variations: Species shows little variation in India.

The Common Clubtail 28.

A. crassipes (Female)

without scent wool.

W(P)A Schedule I CITES Not Listed

Scientific Name: Polydorus coon sambilanga / Atrophaneura coon sambilanga (Doherty) Synonyms: Papilio doubledayi sambilanga, Losaria sambilanga, Papilio coon sambilanga, Tros coon sambilanga, Byasa coon sambilanga.

Status: Critically Endangered Wingspan: 118-134mm. **Identifying Features:**

- Wings Very long and narrow. Ground colour black.
- FW Prominent streaks extend into cell but not upto termen.
- HW Spatulate tail, white outer two third in cell, spot below cell short, two red marginal spots united with the corresponding submarginal ones of area 3.



Atrophaneura coon

- Abdomen With very weak scent fold in male.
- Intraspecific Variations: The subspecies shows little variation; differs from A. coon cacharensis its counterpart in India in having marginal red spots in area 3 united with those in corresponding submarginal area of UpH.

29. The Crimson Rose

W(P)A Schedule I CITES Not Listed

Scientific Name: Papilio hector Linnaeus

Synonym: Tros hector, Pachliopta hector, Polydorus hector, Atrophaneura hector, Aernauta

hector, Menelaides hector, Byasa hector, Papilio heroicus.

Status: Least Concern Wingspan: 90-110mm. Identifying Features:

- Upperside Bluish black.
- FW Broad band consisting of pale yellowish white streaks extending obliquely from the subcostal vein opposite origin of V10 & V11 upto tornus.
- Similar but shorter subapical band.



Papilio hector

- HW UpH Discal, transverse, outwardly curved series of 7 bright crimson spots; a submarginal row of dull crimson coloured lunules.
 - UnH Similar but crimson spots larger
 - Gen. Character Head, collar, sides of thorax and abdomen bright red. Antennae, thorax and abdomen above (at base) black
 - Intraspecific Variation: Females paler, the anterior spots and sub-marginal lunules/crescents may be almost white. (In female it is nearly yellow and present towards the costa).



Papilio hector

30. The Rose Windmill

W(P)A Schedule II (Part II) CITES Not Listed

Scientific Name: Polydorus latreillei kabrua / Tros latreillei kabrua Tytler

Atrophaneura latreillei kabrua

Status: Rare

Wingspan: 110-130mm. Identifying Features:

- Upperside Dull Brownish black with pale internervular streaks.
- HW UpH White spot in 5 reaches V6, but does not fill the base of area 5. Submarginal crimson lunules.
- Intraspecific Variations: In A. latreillei latreillei male no discal spot in 5. In female spot in 5 small reaching only halfway to V6.



Atrophaneura latreillei



The Nevill's Windmill

W(P)A Schedule I CITES Not Listed

Scientific Name: Polydorus nevilli / Atrophaneura nevilli (Wood-Mason)

Synonyms: Papilio nevilli, Byasa nevilli, Tros nevilli.

Status: Critically Endangered Wingspan: 100-120mm. **Identifying Features:**

- Ground colour brownish black.
- FW Internervular streaks velvety black.
- HW UpH Very large discal but no submarginal spot in area 5, those in 2, 3 & 4 prominent.
- Large white spot in 6 & smaller one in 7.



A. nevilli (Female Upperside)



A. nevilli (Male Upperside)

- However, one in area 3 is often absent.
- Tail black (without any red spot as seen in P. Ravana).
- Yellowish white scent wool present in male.
- Sexual abdominal fold within white, not blackish brown.
- Intraspecific Variations: This species is not known to show significant variation.

The Pemberton's Chinese Windmill

W(P)A Schedule I CITES Not Listed

Scientific Name: Polydorus plutionius pembertoni / Atrophaneura plutionius pembertoni (Moore) Synonyms: Byasa pembertoni, Papilio alcinous race pembertoni, Papilio plutonius pembertoni, Tros alcinous pembertoni, Atrophaneura pluotnius pluotnius.

lunules.

Status: Critically Endangered Wingspan: 100-120mm. **Identifying Features:**

- Male Ground colour sooty black.
- FW With broad pale adnervular streaks extending from near base to the outer margin, present also in the cell.
- HW UpH Cell and submarginal interspaces pale, veins black. Interspaces 2-6 show broad pinkish white lunules.
- UnH Paler with an extra lunule in tornus.
- Tail spotless, black, underside paler. HW resembles the upperside with 2 additional submarginal pinkish-white lunules in UnH in area 7 and tornus.
- Female Ground colour pale olivaceous sooty.



Male Upperside



Female Underside

- FW With black veins and streaks.
- HW Submarginal pale flesh coloured lunules slightly larger than in males. The borders surrounding them dull black.
- Underside paler with 6 submarginal & 1 anal lunule.
- FW With black veins and streaks.
- HW Submarginal pale flesh coloured lunules slightly larger than in males. The borders

surrounding them dull black.

- Underside paler with 6 submarginal & 1 anal lunule.
- Intraspecific Variations: Other subspecies in India is Atrophaneura plutonius tytleri

33. Tytler's Chinese Windmill

W(P)A Schedule II (Part II)
CITES Not Listed

Scientific Name: Polydorus plutonius tytleri (Evans).

Synonym: Tros alcinous tytleri, Atrophaneura alcinous tytleri, Atrophaneura plutonius

tytleri, Tros impediens.

Status: Rare

Wingspan: 100-120mm Identifying Features:

- Tail black in both sexes.
- Upperside In males brownish black and unmarked except for a row of markings.
- HW UpH This row consists of prominent black marginal spots and a small red submarginal spot on V2. [In Pemberton's Windmill (Atrophaneura plutonius pembertoni) this row from veins 2 to 6 on the UpH consists of whitish marginal spots and UnH red submarginal spots upto V6.]
- Female Paler above with traces of red lunules on the margins from V3 V6 on the UpH.





34. The De Niceville's Windmill

W(P)A Schedule I CITES Not Listed

Scientific Name: Polydorus polla / Atrophaneura polla (de Niceville)

Synonyms: Byasa polla, Papilio polla, Papilio latreillei

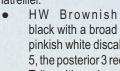
polla, Tros polla, Atrophaneura polla polla.

Status: Vulnerable Wingspan: 110-130mm **Identifying Features:**

FW Brownish black with deep black longitudinal streaks within the cells and between the veins that are velvety black.

Proportionately rather narrower FW than Polydorus

latreillei.





P. polla (Male Upperside)

pinkish white discal band, submarginal spots 4, rarely 5, the posterior 3 red, the others more or less white. Tails with red spots at the tip and thus closely resembles Polydorus latreillei but the termen

- more oblique and tornus more rounded. With a discal white patch composed of 4 elongate spots, a submarginal series of crescent vermillion red marks, larger than in P. Latreillei.
- In female post-discal white patch continued to anal margin but not extending to cell-end and without scent fold.
- Intraspecific Variations: The species is not known to show significant variation.

The Kaiserihind

P. polla (Female Underside)

Scientific Name: Teinopalpus imperialis imperialis Hope Synonyms: Teinopalpus parryiae, Teinopalpus himalaicus.

Status: Rare Wingspan: 90-120mm **Identifying Features:**

- Upperside Black, covered in green scales except for area of a somewhat concave, subbasal band and narrow terminal edging which is black due to absence of green scales, followed by 2 more broad bands and 1 narrow submarginal black band.
- FW UpF 2 grey bands in female.
- UnF In males basal half is green bordered by black. Outer half yellow-brown. Black discal And post discal bands. Female mostly grey.
- HW UpH Prominent yellow discal area stained with orange from area 4-8 and enters end cell in males, ends just before V3.
- Female with this area grayish, larger, with narrow yellow markings/patch from base to area 2.



W(P)A Schedule II (Part II)

CITES Appendix II





- Post discal area dark green lined towards the inside with grey and with submarginal lunules towards the outside, of which the tornal and upper 2-3 are yellow and the others are green in male.
- Similar pattern in female except the apical lunule is dark grey, not yellow.
- UnH Basal area is densely covered with green.
- Females similar to males except that yellow is replaced by grey. Tail
- Tail is tipped with yellow in male.
- Female with more i.e. 3 tails, 2 are prominent at V2 & V4, shorter at V3.
- Intraspecific Variations: In UpH yellow discal area scarcely enters end cell and end on V2 in T. i. imperatrix. In female UpH darker yellow dorsal area to V3.



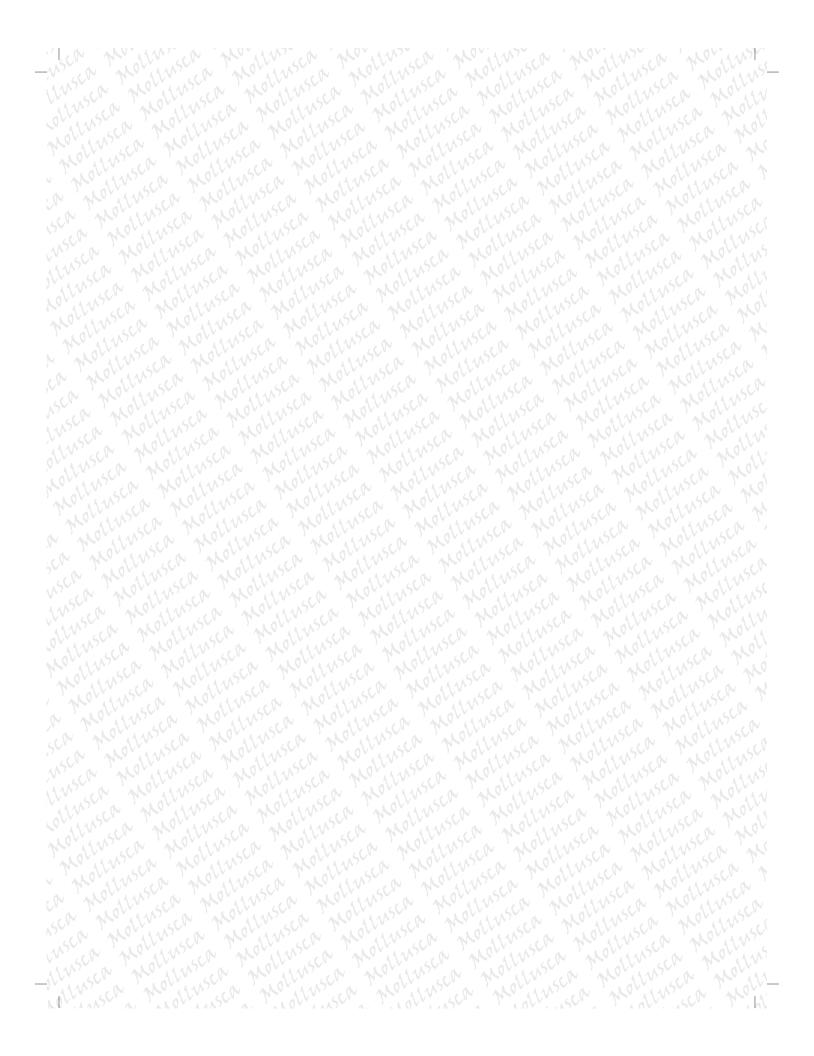








Identification Manual on Mollusca



SUBJECT

Diagram of Hypothetical Gastropod Shell
Diagram of Hypothetical Bivalve Shell
Cassis cornuta
Charonia tritonis
Conus milne-edwardsi
Cypraecassis rufa
Hippopus hippopus
Nautilus pompilius
Tridacna maxima
Tridacna squamosa
Tudicla spirillus
Cypraea limacina
Cypraea mappa
Cypraea talpa
Pleuro, loca trapezium/Fasciolaria trapezium
Harpulina arausiaca
Lambis chiragra
Lambis chiragra arthritica
Lambis crocata / Lambis crocea
Lambis millepeda
Lambis scorpius
Lambis truncata
Placuna placenta/Placenta placenta
Strombus plicatus sibbaldii
Trochus niloticus
Turbo marmoratus
Glossary





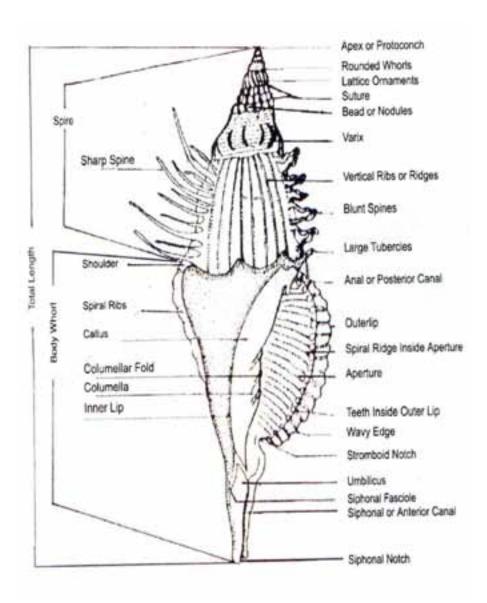


Fig 1: A hypothetical Gastropod Shell showing important parts

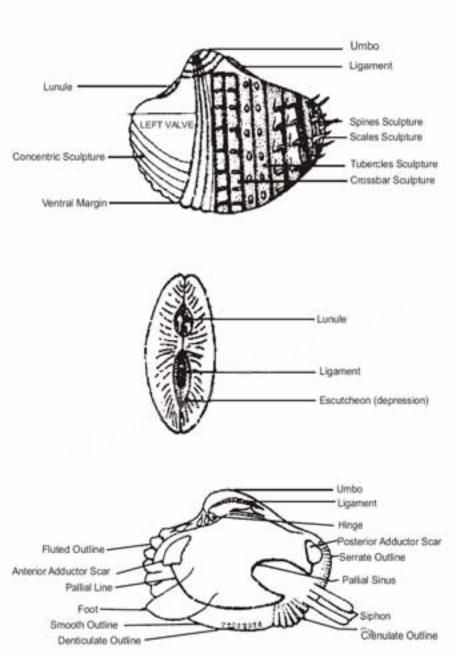


Fig: A hypothetical Bivalve Shell showing the important parts.









Ventral View

Scientific Name: Cassis cornuta (Linnaeus)

Common Name: Horned helmet

W(P)A Schedule I
CITES Not listed

Identifying features:

- Solid and heavy shell upto 350 mm in length.
- Outer lip large. Large calloused shield on the columella.
- Inner and outer lip with large prominent whitish teeth.
- Dorsally gray or white, ornamented with faint spiral rows of spots and sculptured with numerous heavy knobs and spiral cords.
- Aperture and columellar shield yellow or orange.
- Males smaller than females.

<u>Distribution</u>: Indo Pacific coral reef, I to 20 m deep. India: Andaman Islands, Gulf of Mannar (Tamil Nadu), Pondicherry (rare).

Remarks: It is commonly called as "King Shell". Whole shell is sold as souvenirs or decoration pieces. Handicraft products/souvenirs may also be made such as lampshades.





Ventral View

Dorsal View

Scientific Name: Charonia tritonis (Linnaeus)

Common Name: Trumpet triton

W(P)A Schedule I
CITES Not listed

Identifying features :

- Shell length upto 380 mm.
- Creamy pink with reddish or dark brown crescents and patches.
- Aperture orange brown with white channels between teeth on outer lip.
- Spine elongated, Rounded narrow whorls.
- Broad body whorled with two prominent varices.
- Deeply grooved flattened spiral ribs and occasional thin, extra ribs below.
- Well-impressed suture. Broad and short siphonal canal.
- A well developed foot.

Distribution: Indo Pacific coral reefs and rocky bottoms in shallow water.

India: Andaman and Nicobar Islands, Lakshadweep.

Remarks: One of the largest members of the phylum mollusca and facing extinction. It feeds on starfishes. It is a key species in reef ecosystems because it feeds also on the crown of thoms sea stars. In the IUCN Red Data Book (1984) it is listed as an Endangered species due to overexploitation by shell dealers. A single shell costs Rs. 2000.00 or even more. The shell is used for manufacturing lime in the lime industries. It is a collectors' item. It is also used as a form of trumpet.





Scientific Name: Conus milne-edwardsi Jousseaume

Common Name: Glory of India

W(P)A Schedule I
CITES Not listed

Identifying features:

- Heavy, glossy, elongated, biconic shell upto 100 mm in length.
- Elongated spine. Stepped whorls that are concave above and spirally ridged.
- Shoulder of last whorl slightly keeled.
- Body white, netted with large, orange-brown to darker brown tents.
- Three irregular spiral bands of reddish brown blotches (of which two are very prominent) are diagnostic.
- Spire whorls with similar colour.
- Creamy or white aperture with deep cleft at its posterior end.
- Spire lengthier than most other cone species.

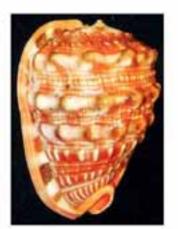
Distribution: Indian Ocean. India: Andaman and Nicobar Island reefs.

Distributed in offshore area, rather rare/endangered.

Remarks: Only a 100 or so species are said to be available worldwide.

It is among the most brilliantly coloured cones.





Ventral View

Dorsal View

Scientific Name: Cypraecassis rufa (Linnaeus)

Common Name: Bull mouth helmet

W(P)A Schedule I CITES Not listed

Identifying features:

- Solid and heavy shell 90-180 mm in length.
- Dorsally broadly ovate, orange brown.
- Almost flat spines obscured by columellar callus.
- Body whorl lirate with 3-4 rows of blunt knobs.
- In between large knobs smaller nodules and pitted grooves present.
- Columellar callus large. Columella reddish brown, lirate with small teeth.
- Interstices dark brown.
- A developed foot, distinct head with two narrow and long tentacles.
 The eyes are near the bases of the tentacles.
- Operculum is horny, circular, very small and a roughly central nucleus.

Distribution: Indo Pacific, India: Andaman and Nicobar Islands. Lakshadweep.

Remarks: Distributed on fairly coarse coral sands in the infralittoral and mesolittoral zones. It is popular as "Pineapple" shell or Queen shell among the shell dealers in Andaman & Nicobar Islands. Usually seen to be sold whole, rarely as handicraft articles.





Scientific Name : Hippopus hippopus (Linnaeus) W(P)A Schedule 1
Common Name : Fluted Giant Clam/Horse's Hoof. CITES Appendix 11

Identifying features:

- Bivalve shell upto 400mm in length.
- Elongate to ovate-triangular or sub-rhomboidal in shape.
- Valves thick and heavy.
- Radially sculptured with 13-14 moderately convex rib-like folds.
- Concentric sculpture fine and wavy, dorsal margin undulate with 8-12 squarish medially projecting processes.
- Scales worn or broken on ventral half.
- Cardinal teeth one in each valve.

Distribution: Indo-Pacific. Malay Peninsula to Eastern Melanesia.

India: Nicobar Islands. Distributed in shallow water coral reefs, common.

Remarks: The edges of the mantle lobes are fused as in all other tridacnids. The mantle has symbiotic microscopic algae zooxanthellae living in it, which are partly responsible for the striking mantle colouration. It has industrial use as for other giant clams. These are also exploited for edible purposes.





Polished Shell

Scientific Name: Nautilus pompilius Linnaeus

Common Name: Chambered Nautilus

W(P)A Schedule I CITES Not listed

Identifying features:

- Shell upto 200mm in length. White or cream coloured.
- Shell partitioned, bilaterally symmetrical, spirally coiled, light.
- Resulting chambers are connected with each other by a hollow tube.
- Large aperture without umbilicus.
- The broadest part of the body whorl with zebra-like reddish stripes.

<u>Distribution</u>: Indian Ocean, Western and Central Pacific. India: Andaman Islands. Pelagic, found at a depth of 50-100 meters.

Remarks: The only cephalopod with true external shell when full-grown. It is caught along eastern coast in fishing nets. There are approximately 38 chambers. The shell is geometrically perfect. Whole shells are sold as such or polished and made pure white. It is often made into different kinds of handicrafts especially along with silver.







Ventral View

Dorsal View

Scientific Name: Tridacna maxima (Roeding)

W(P)A Schedule I CITES Appendix II

Identifying features:

Bivalve shell upto 350mm in length.

Common Name: Elongate Giant clam.

- Elongate to short, obtuse triangular in shape.
- The angle at umbonal region is less than 150° formed by margin of hinge and ventral border.
- Presence of a large byssal orifice.
- Shells heavy, thick. Colour usually grayish white tinged with yellow, pinkish orange.
- Concentrically sculptured with closely spaced undulate growth lines.
- Radially sculptured with 6-12 broad, moderately convex rib-like folds.
- Scales often worn off near umbo.
- Cardinal teeth single on both valves.
- Umbos posteriorly directed.

Distribution: Indo-Pacific, India: Andaman and Nicobar Islands.

Distributed in shallow coral reefs, common.

Remarks: The population status of *Tridacna maxima* is Endangered. These types of giant clams are the constituents of pottery glazes and also used in making floor tiles. Flesh eaten in some countries.



Dorsal View

Scientific Name: Tridacna squamosa Lamarck

Common Name: Fluted Giant Clam.

W(P)A Schedule I CITES Appendix II

Identifying features:

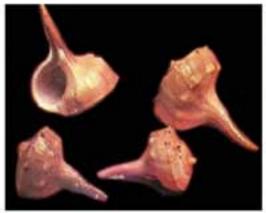
- Bivalve shell upto 408mm in length, thick, heavy and semicircular in outline.
- The angle at the umbo formed by hinge line and ventral margin is over 150°.
- Byssal orifice medium sized to small, valves thick and heavy.
- Radially sculptured with 4-12 strong, rib-like folds.
- Concentric sculpture consists of undulate lines of growth which are widely spaced and leaf-like.
- Scales worn or broken on ventral half.
- Dorsal margin broadly fan-shaped.

<u>Distribution</u>: Indo-Pacific. India: Andaman Islands. Distributed in shallow reefs upto 10m, locally common.

Remarks: Almost all the tridacnid shells are used as ornaments, water containers and tools by the natives of Pacific Islands. Perforated disc manufactured from these tridacnids used as money in Solomon Islands. It also has industrial use in pottery glazes, floortiles, etc.









Scientific Name: Tudicla spirillus (Linnaeus)

W(P)A Schedule I CITES Not listed

Identifying features:

Common Name: Spiral Tudicla

- Solid shell, length upto 90mm. Colour brownish grey with irregularly placed reddish brown blotches.
- Body whorl inflated with a sharp keel at the shoulder and shallow spiral grooves below.
- Short, flatly compressed spire portion above body whorl.
- Apex bulbous and white. Suture fine.
- Single-folded, broadly expanded, white columella with plate-like callus.
- Long siphonal canal, curved at the end.
- Whitish with brown blotches on the keel.
- Aperture interior grooved.

<u>Distribution</u>: India: South India (Pondicherry). Distributed offshore upto 20 m, locally common.

Remarks: Traded as decorative seashells.





Dorsal View

Ventral View

Scientific Name: Cypraea limacina Lamarck

Common Name: Limacina Cowrie

W(P)A Schedule IV CITES Not listed

Identifying features:

- Light-weight, solid, clongately ovate upto 20 mm shell with scarcely produced extremities and highly polished look.
- Outer lip margin pitted.
- Teeth prolonged and bordered with brown.
- Columellar teeth not reaching the margin.
- Dorsum greenish to reddish brown covered with small white bluish spots.
- Margins and extremities with irregular brown spots, base and teeth white.

<u>Distribution</u>: Indo west pacific. India: Tamil Nadu (Gulf of Mannar).
Distributed under stones, rock, mud and slit; moderately common.

Remarks: Like all cowries it is attached to superstitious beliefs. Use has been made as for other cowries as currency, charms, ornaments, purses, belts, decoration pieces, traditional medicines (Kapardak Bhasma), etc.









Dorsal View

Ventral View

Scientific Name: Cypraea mappa Linnaeus

Common Name : Map Cowrie

W(P)A Schedule IV

CITES Not listed

Identifying features:

Ovate and inflated shell upto 70 mm.

- Brownish dorsum ornamented with reticulated pattern. Wide and clear dorsal line from which branch a number of feeler-like extensions.
- Margins thickened with darker indistinct spots.
- Base convex, white or rich pink or cream or purplish in colour.
- Teeth white or orange coloured.

<u>Distribution</u>: Indo-Pacific. Indonesia and Australia. India: Andaman & Nicobar Islands. Distributed in coral reefs, under slabs, shallow and deeper water, rare.

Remarks: As a cowrie these have been used as currency. They are also linked to various superstitions leading to use as charms, ornaments, medicine, etc.



Ventral and Dorsal View

Scientific Name: Cypraea talpa Linnaeus

Common Name: Mole Cowrie

W(P)A Schedule IV

CITES Not listed

Identifying features:

Solid, glossy elongately ovate, light-weight, shell upto 85 mm in length.

- Margins slightly developed.
- Smooth and produced extremities.
- Apex well identified.
- Flat base, blackish brown in colour.
- Narrow aperture with numerous fine, linear, brown teeth.
- Dorsum pale yellowish brown, with 4 broad, transverse dark brown bands.
- Margins chocolate brown, whitish between the teeth.

<u>Distribution</u>: Indo-Pacific. India: Andaman & Nicobar Islands. On coral reefs in shallow and deeper water.

Remarks: It is rare. Use has been as for other cowries as currency, handicrafts like handbags, belts, etc.







Dorsal and Ventral View

Scientific Name : Fasciolaria trapezium/Pleuroploca trapezium (Linnaeus)

Common Name : Trapezium Conch. W(P)A Schedule IV

CITES Not listed

Identifying features:

- Strong and heavy reddish and cream coloured shell upto 300 mm.
- Spire elongated, sharply pointed, body whorl large, apex usually eroded.
- Suture shallow, aperture large with strong ridges on the interior and 7 pairs of teeth where they meet.
- Crowded spiral lines in denticulate outer lip. Columella smooth.
- Spiral rows of large tubercles at periphery of spire whorls and shoulder of the body whorl.
- Spiral lines are arranged in pairs. Strong growth ridges.
- Operculum thick, homy and brown in colour, periostracum translucent or opaque and brown in colour.

<u>Distribution</u>: Indo-Pacific. India: Andaman Islands. West Bengal Coast.
Distributed in shallow water, common. Inhabitant of coral rocks of intertidal region.

Remarks: Mainly tropical with camivorous habit. Commonly traded in India especially along the coast at tourist spots as whole shells or made into decorative pieces, lampshades, pen-stands. It is edible etc.



Ventral View

Scientific Name: Harpulina arausiaca (Lightfoot)

Common Name: Vexillate volute/ Gold Banded Volute

W(P)A Schedule IV CITES Not listed

Identifying features:

- Thick, stout, long spired shell upto 75 mm.
- Shell sometimes much produced at apex.
- Body whorls three times longer than spires.
- Whorls obtusely nodulose.
- Protoconch (tip portion) rounded.
- Columella with eight plications.
- White with orange or red transverse bands, generally these are more or less divided as they approach the outer lip.

Distribution: Sri Lanka and Southern India (Gulf of Mannar). Offshore to 10 m.

Remarks: Uncommon. Carnivorous gastropods found mostly in warm waters. Inhabits shallow water of intertidal zone. Often found to be used for making curtains, wall hangings, key rings and composite decoration pieces like wall clocks, mirrors, etc.







Ventral and Dorsal View

Scientific Name: Lambis chiragra (Linnaeus)

Common Name: Chiragra Spider Conch.

W(P)A Schedule IV CITES Not listed

Identifying features:

- Shell upto 250 mm in length with 5 large labial digitations and a siphonal canal turned leftwards.
- Large stromboid notch located below 4th and 5th labial digitations.
- Whorls 9 to 11. Inner lip serrated. Aperture pink orange.
- Spire concave, bordered above and below by two raised, spiral cords.
- Spiral sculpture with numerous small threads on the body whorls.
- Shell white, with crowded zigzag streaks of purple-brown colour.
- Operculum chitinous, dark brown, fusiform with fine striations on one side.
- Male shells are smaller with strong white spiral lirae over purple coloured columella and five knobs on body whorl. Female shells are bigger with whitish rosy aperture and smooth white columella.

<u>Distribution</u>: Indian Ocean to Eastern Polynesia. India: Andaman & Nicobar Islands, Lakshadweep in shallow water. Common. Associated with sand/algae covered reefs.

Remarks: Sold as whole shells, pen stands, lamp shades, showpieces, ashtrays, etc. The shells are used in lime industries for lime production.





Ventral View

Dorsal View

Scientific Name: Lambis chiragra arthritica Roeding

Common Name: Arthritic Spider Conch

W(P)A Schedule IV CITES Not listed

Identifying features:

- Shell upto 190 mm in length.
- Outer lip bears 5 spinous processes and a siphonal canal turned to the left, smaller and more curved than in Lambis chiragra chiragra.
- Broad rounded arching on the end of the aperture.
- Colour inside of outer lip yellowish or pinkish yellow patched with purplish hue.
- Columella brownish purple with strong whitish spiral lirae.
- Periostracum thin, vamish like.

<u>Distribution</u>: East Africa to Central Indian Ocean. India: Pondicherry. Reef (weed-covered stony reefs) dweller in the mesolittoral zone.

Remarks: Traded mainly as decorative seashells as whole shell or made into handicrafts. The shells are used in time industries for time production.







Ventral View

Dorsal View

Scientific Name: Lambis crocata (Link) / Lambis crocea

Common Name: Orange Spider Conch.

W(P)A Schedule IV

CITES Not listed

Identifying features:

- Shell upto 150 mm in length with 6 small slender spines.
- Long slender curved (twisted to right) siphonal canal.
- Sculptured with a nodulose sutural carina and spiral cords on the early whorls
- Aperture solid, orange and smooth, purple-brown deep inside.
- Stromboid notch wide and deep.
- Columella swollen and smooth, bright orange in colour.
- Shells white, blotched with brown.

Distribution: Indo-Western Pacific. India: Andaman Islands. Sea ward coral reef, low tidemark to 10 feet, moderately common.

Remarks: Often sold as decorative seashells. Shells are useful in making lime.



Dorsal and Ventral View

Scientific Name: Lambis millepeda (Linnaeus)

millepeda (Linnacus) W(P)A Schedule IV
ed Spider Conch CITES Not listed

Common Name: Milleped Spider Conch

Identifying features:

Shell upto 150 mm in length with digitations.

- Sculptured with spiral cords and nodes.
- Outer lip with 9-10 short labial digitations, upper three spines large and the other six short and hooked towards apex.
- Siphonal canal short and twisted.
- Aperture mauve-brown with numerous white lirae.
- Prominent sculpture (lirae) on columella. Creamy white or mauve brown between lirae.

Distribution: South-Western Pacific, Indian Ocean. Distributed in shallow water, moderately common upto 2 fathoms depth.

Remarks: Traded as decorative seashells. The shells are used in lime industries for lime production.







Ventral and Dorsal View

Scientific Name : Lambis scorpius (Linnaeus)
Common Name : Scorpio Conch.

W(P)A Schedule IV CITES Not listed

Identifying features:

- Shell, upto 170 mm in length. 6 knobbed labial digitations.
- Siphonal canal very long and grooved, curved to right.
- Whorls 9. Spiral ribs with low knobs prominent on body whorl.
- Many raised spiral lirae inside the outer lip.
- Aperture small, quadrate.
- Operculum long, slightly curved with 10 small serration.
- Chestnut coloured shell. Aperture and columella purplish, with white striae on light orange background.

Distribution: Indonesia and Ryukyu Islands to Samoa. India: Distributed in shallow water upto 10 feet depth, moderately common. Found usually on coral reef flats or among dead coral slabs and boulders.

Remarks: Traded as decorative seashells as for other *Lambis* spp. Also used in the lime industries to make lime from their shells.



Ventral and Dorsal View

Scientific Name: Lambis truncata (Humphrey)

Common Name: Truncate Spider Conch.

W(P)A Schedule IV CITES Not listed

Identifying features:

- Shell upto 370 mm in length.
- Six slightly arching labial digitations.
- Straight and small siphonal canal.
- Whorls 9-10, apex with 4-5 flat whorls.
- 2 or 3 knob-like swelling on the dorsum of body whorl.
- Spiral aperture and parietal area glossy, aperture tan or purplish brown in colour. Columella straight.
- Periostracum moderately developed.
- Operculum brown, chitinous, elongate, slightly curved.

Distribution: East African Coast to Bay of Bengal and Cocos Keeling Atoll. India: Andaman & Nicobar Islands. Distributed in coral reef, 10-12 feet habitat depth; shallow water, common.

Remarks: Traded as decorative seashells. Eaten raw or roasted by natives. The shells are used in lime industries for lime production. Similar to *Lambis lambis* which is smaller (20cm), with large rounded nodules on body whorl.







Polished shell with painting

Scientific Name: Placenta placenta/Placuna placenta Linnaeus

Common Name: Windowpane Oyster W(P)A Schedule IV

CITES Not listed

Identifying features:

Irregularly rounded, often thin and translucent, smooth or sculptured.

Sub-circular, flat, fragile, very compressed shell upto 180 mm diameter.

Left valve little convex and right valve little concave.

Hinge line straight and very short.

 Concentric sculpture of very thin appressed lamellae which are radially vermiculate.

Inner surface smooth, glossy, displaying a brilliant pearly iridescence.

Inconspicuous, small umbo with two teeth.

Adductor impression occurs at about the center of the valve.

<u>Distribution</u>: Philippines, S.E.Asia. India: Andaman Islands, Goa, Orissa, Tamil Nadu, West Bengal Coast. Abundant. Free living animals sheltered in muddy lagoons in shallow water. Inhabits sandy bottom in mesolittoral zone.

Remarks: The thin pearly shell has the appearance of mica. Was earlier used for glazing windows by the Chinese and Portuguese. Some old mansions in Goa still have such windows. In Philippines and India (especially Goa) they are still fished up in large numbers and manufactured into screens, windows, lampshades, ornaments, hangings, chandeliers, bowls and vases in combination with clay/wood,etc. and used for paintings and other decorative articles. It is a source of shell lime. Meat is edible.



Ventral View

Scientific Name: Strombus plicatus sibbaldii Sowerby

Common Name: Sibbald's Conch/Pigeon Conch W(P)A Schedule IV

CITES Not listed

Identifying features:

Shell upto 50 mm in length, winged.

- Shell white, semi glossy, blotched and banded with beige.
- Axial plication (fold on the columella) is seen.
- Spire slightly concave.
- Outer lip rounded, thickened at the edge.
- Columella and aperture sculptured. Aperture white. Columellar base with 5-7 weak teeth, columellar lirae tinged with brown.
- Upper half of the last whorl smooth, lower half spirally ridged.
- Periostracum thin, varnish-like, smooth.

Distribution: Gulf of Aden to Sri Lanka. India: Kerala Coast, Gulf of Kutch, Bay of Bengal. Uncommon.

<u>Remarks</u>: Different handicrafts are made from these shells. Maximum use is for key rings, sometimes carved and used for other decorative articles. Sometimes used to make porcelain.







Pearlised shell

Scientific Name: Trochus niloticus Linnaeus Common Name: Commercial trochus / Top shell W(P)A Schedule IV CITES Not listed

Identifying features:

- Solid, heavy, large, conical shell upto 150 mm in length (Largest of the genus).
- Body whorls widely flattened, more wide than long. Shell almost swollen at the base. Base flat, excavated in the middle. Thin horny operculum.
- Smooth columella off-white in colour. Spire distinct.
- Columella ornamented with vermilion coloured flame-like stripes.
- Concentric sculpture fine and wavy.

<u>Distribution</u>: Indo-Pacific. India: Andaman & Nicobar Islands. Shallow reef to subtidal zone.

Remarks: Trochus has large foot which is extracted by boiling and smoked and can be eaten. Ranging from the eastern Indian Ocean to Samoa, and from Queensland to Japan, it was hunted so relentlessly by divers that commercial fishing had to be stopped from 1939-45 to allow natural beds to recover. It has a thick mother of pearl layer reason why it is used in the manufacture of pearl buttons, ornaments like earrings, pendants, necklaces, bangles, etc. After grinding/polishing whole shells or cut off shells are used for making containers, table lamps, agarbatti stands, pen-stands, paper-weights, etc. often in combination with white metal, silver, etc. There are several processing units in Kolkata and Tamil Nadu and sales are in Tamil Nadu, Goa, Pondicherry, Maharashtra, etc.





Pearlised shell

Scientific Name: Turbo marmoratus Linnaeus

Common Name: Great Green Turban

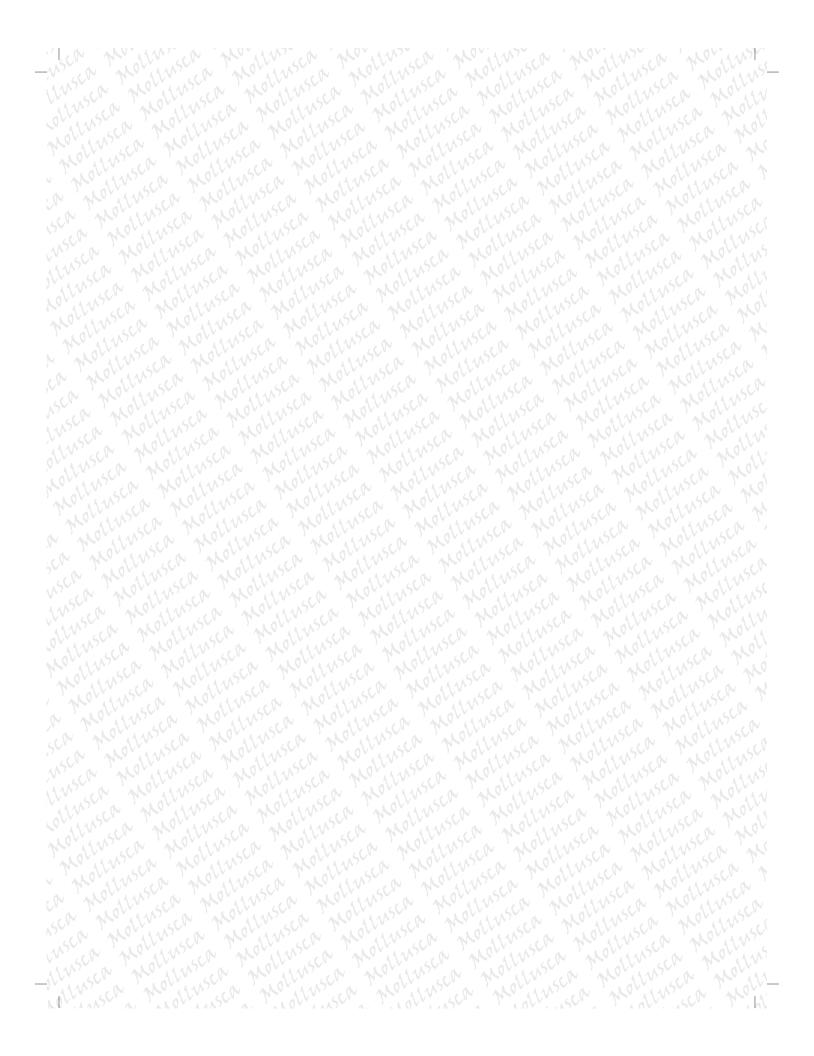
W(P)A Schedule IV CITES Not listed

Identifying features:

- Solid, heavy, coiled shell upto 200 mm in length (largest in the family), somewhat resembling a turban.
- Sculptured with 1-3 nodulose keel / ridges.
- Spire obtuse, elongated. Suture deep.
- Body whorl concavo-convex, very expanded.
- Aperture large, Pearly inside,
- Columella concave, smooth and umbilicate.
- Shell marbled with dark brown green and cream coloured blotches.
- Operculum large, heavy, smooth, calcareous, white in colour, fixed to the foot of the animal.

Distribution: Indo-Pacific. India-Andaman Islands (coral reefs under boulders).

Remarks: Commercially important gastropod. The operculum in Turbo is plano-convex and is called as "Cat's Eye". The outer surface of the shell is drab. If this is dissolved in dilute acid, an exquisite mother-of-pearl layer is exposed. Large Turbo are thus prepared and made into knick-knacks like ash-trays, agarbatti stands, flower vases, etc. The turban shells have become rare in the Andaman & Nicobar Islands and are represented by sparse population. Like Trochus, it is most endangered by trade and indiscriminate fishing.







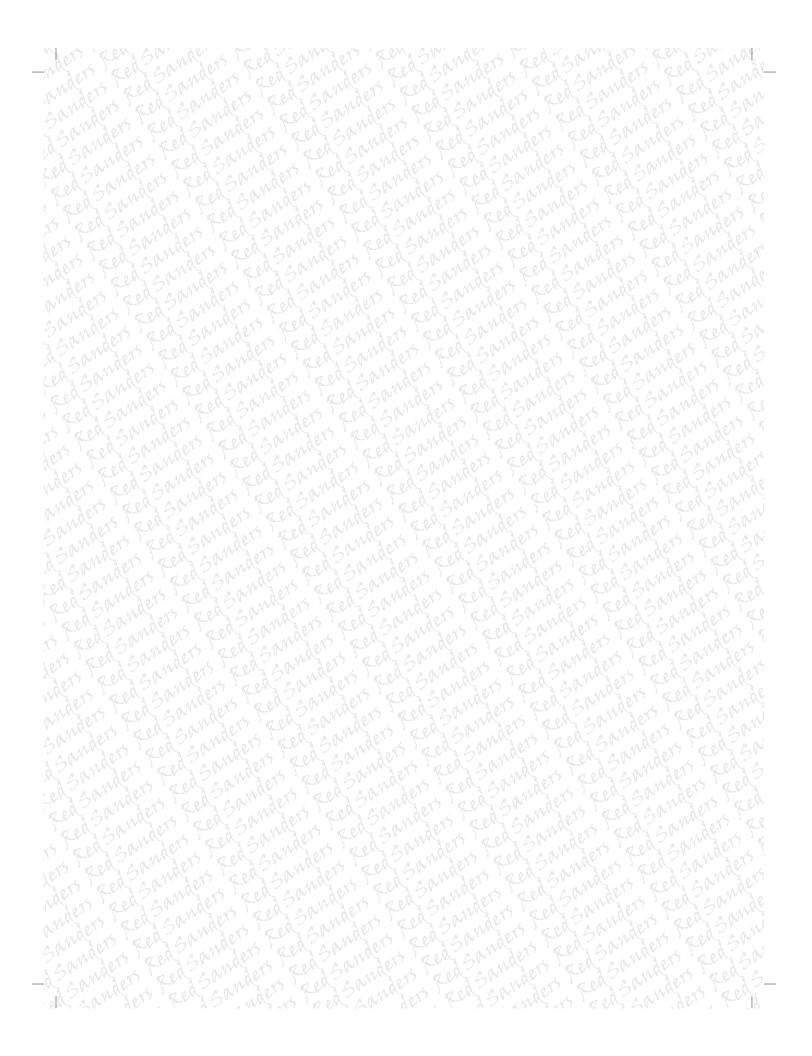


Red Sanders









Extent and Geographical Distribution

Pterocarpus santalinus occurs in the forest formation which is classified as "5A/C3 Southern Tropical Dry Deciduous Forests" as per Champion and Seth Classification and falls in the eco-terrestrial region IM1301 Deccan Thorn Scrub Forests and as well as IM0201 Central Deccan Plateau Dry Deciduous Forests. It is generally found at altitudes of 150 - 900 m. It grows on dry, hilly, often rocky ground, and occasionally found on precipitous hill sides also. It prefers lateritic and gravelly soil and cannot tolerate water logging. In natural habitat the tree experiences hot, dry climate with normal rainfall of 88-105 cm received from north-east and south-west monsoons.

The principal tree association is *Pterocarpus marsupium*, *Chloroxylon swietenia*, *Terminalia chebula*, *T. tomentosa*, *Albizia lebbek*, *Hardwickia binata*, *Anogeissus latifolia and Dalbergia latifolia*. Red Sanders many times occurs gregariously as pure patches also.

A view of the Red Sanders bearing Forest



Red Sanders has a highly restrictive distribution in the South Eastern portion of Indian peninsula to which it is endemic. The Palakonda and Seshachalam hill ranges of Cuddapah-Chittoor districts of the State of Andhra Pradesh are its principal geographical range which extends slightly into the neighbouring Anantapur, Kurnool, Prakasam and Nellore Districts of Andhra Pradesh. Sporadic wild populations occur in the adjoining districts of the neighbouring states of Tamil Nadu & Karnataka.

The Red Sanders bearing formations are estimated to extend over approximately 5160 Km2 in its principal geographical range. About 23% of the Red Sanders formation is dense, 34% has moderate cover and the remaining is open. The distribution is indicated in Chart.1, below.

Chart.1 Density class wise distribution of the Red Sander bearing Forests in its principal geographical range







Morphological Characteristics

10-11 m high; bark blackish brown, leaves imparipinnate, leaflets pulvinous 3, rarely 5, with somewhat whitish undersurface. Flowers bright yellow in short racemes consisting 25±4 members, pedicellate, 16mm long, bisexual, zygomorphic and mildly odoriferous.







Calyx tubular near the base becoming free towards apex, corolla consists one standard, two winged and two keeled petals, stamens in two bundles of five each, anthers dithecous. Ovary consists of two ovules. Pods about 5 cm in diameter, winged with one or two seeds in each. Seeds about 1 to $1\frac{1}{2}$ cm long, dolabriformis, coriaceous, reddish brown.

Biological Characteristics

Amoderate sized deciduous tree with erect bole and dense rounded crown, conspicuous by its blackish brown bark resembling the skin of crocodile, divided into rectangular plates by deep vertical and horizontal cracks. A blaze on the bark exposes the white coloured sapwood which gradually turns red due to exudation of a red gummy juice. Heartwood is deep red in colour which on exposure turns to scarlet red. Population level flowering occurs during April-June with individuals flowering intermittently for a period of 3 weeks some times resulting in a mass blooming. Pods form rapidly but ripen only the next February-March. Pollinator activity is limited to moonlit nights and early morning hours.



The natural fruit set is very low about 6% comparative to the quantum of flowers, with xenogamous fruits alone carrying to maturity and dropping of autogamous and geitonogamous. The various factors could be low possibility of energy investment due to the climatic and natural limiting factors during seeding, progressive elimination of poor seeds arising out of self pollination, less probability of outcrossing due to limitations of population size, pollinator availability etc. Population size thus appears to be of crucial importance for continued survival. The pods fall in May and germinate with the onset of monsoons in July. The species exhibits the temperament of a struggling gambler with the shoot dying back many times due to drought, browsing, competition from gamblers etc, till the time the root gains vitality enough to propel the shoot upwards fast in a heliophilous mode. The tree starts shedding its leaves by early January and by the end of February becomes totally leafless. Well before other trees of the area, by early April, the tree puts out young leaves.



Parts & Products

Parts and Derivatives in trade

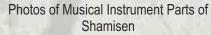
Logs, wood chips, sawn timber, extracts, dyes. The extent of the sectoral demand in the international trade is not clear. Seizures have been principally of logs both domestically and at international exit points. There have been very few interceptions of other forms such as musical instrument parts, sawn timber etc., domestically.





Musical Instruments

Red Sanders is said to be used in the making of oriental musical instruments like Shamisen, *Koto* and *Erhu*.









Characteristics of Demand

National utilization

Extraction of living trees from the natural forests is prohibited and silvicultural removals if any are as per the prescriptions of the approved Working Plans. In the protected areas, removals of any kind are prohibited. Legal trade is limited to occasional sale of confiscated timber by the Government of Andhra Pradesh. The species has negligible utilization within the country mainly in Ayurvedic pharmacopoeia and some times for making small toys. The species has virtually no domestic demand for constructional or furniture use. Almost all the seizures indicate the movement of logs towards the exit points or the seizures themselves are at the exit points during attempted smuggling. An analysis of the seizures occurred during last 5 years indicates that about 90% of the logs seized confirming to 50 to 90 Cms g.u.b while remaining 10% were between 100 to 120 Cms g.u.b.

Actual or Potential Trade Impacts

The illegal trade adversely affects the population structure of the species with the removal of superior phenotypes. It is further aggravated by the special demand for wavy grained individuals which cannot be determined by any observable morphological parameters, causing indiscriminate fellings. The alternative use of the non-wavy grained individuals for the valuable extracts and dyes sustains the interest of the feller even if he fails to find wavy grain.

The extent of the range of end uses for the timber is not fully clear and hence it is difficult to determine as to which sector of demand is fuelling the illegal trade. The species with xenogamous seed production mechanism is dependant on the overall population size as well as the availability of superior pheno/genotypes for generating sustained good quality seed. Failure to do so may adversely affect the important regeneration mechanism through quality seed, leaving only the coppicing mode for the survival of the species.





Identification

1. Physical Properties

Physical Properties

- * Heartwood red to purple brown upon exposure turning dark brown or black.
- * Specific gravity of Red Sanders and some of the look alikes are given below:

SI.No.	Species	Specific Gravity
1	Pterocarpus santalinus (Red Sanders)	0.97
2	Pterocarpus dalbergeoides(Padauk)	0.62
3	Pterocarpus indicus(Bijasal)	0.67
4	Dalbergia latifolia(Rosewood)	0.66

* Water extract is light orange brown and fluoresces with a light blue colour

The undressed logs exhibit a rough bark somewhat resembling crocodilian scales





Under the bark, a white coloured sapwood exists



Upon dressing reveals a deep scarlet coloured heartwood





The wood anatomy of Red sanders and the look alike species

Species	Cross Section1	Cross Section2	Tangential Section
Pterocarpus Santalinus (Red Sanders)	.⇒ ·-		1
Dalbergia latifolia (Rosewood)			
Pterocarpus dalbergioides (padauk)			
Pterocarpus marcupium (Bijasel)			



A moist chip of wood leaves a reddish colour scar on a whitecloth when rubbed upon



Grading Rules: The Andhra Pradesh Forest Department prescribes the following general standards for the Red Sanders logs from commercial perspective:

- * Logs to be dressed nearly upto heartwood
- * Straight or nearly straight
- * Minimum length of 75 Cms
- * Top end girth of 36 cms or above.

The logs are further graded into A, B, C or Non-Grade according to the following characteristics.

A-Grade

* Sound or nearly sound with few or no defects



B Grade

- * Semi-sound A grade logs with more defects
- * A grade logs with bends
- * Logs sound or semi-sound with some defects



* Logs with medium long and medium deep wavy grain clearly visible



C-Grade

- * Long and shallow wavy grain or straight grain
- * logs sound or semi-sound with some or no defects
- * Un-sound but utilizable A-grade logs with many defects
- * Un-sound but utilizable B-grade logs with many defects







Comparison of different grades of logs Visual Comparison





Accoustic Comparison

The logs when hit by a small hammer produce sounds of varying accoustic quality depending on the grade which in turn depends on the quality and arrangement of wood fibres.

The group of sounds starts with Grade A followed by B & C, in the accompanying sound clip. Observe the change in pitch and resonance from A to C.



Criminality

Modus Operandi:

Qualitative shift in trends: Of late the following trends are indicated.

- * Largely Musical Instrument Parts throughout 90's
- * Currently overtaken by Logs
- * smuggling of cut to size pieces of Red sanders and semi finished parts of musical instruments

Domestic

Smuggling by hierarchical criminal groups through the following statges

- * Stage-1:- Certain Traders / Middlemen on behalf of the Traders stationed elsewhere (Chennai etc) contact some middlemen in medium towns near the forest areas and pay them advances to organize cutting of wood .
- * Stage 2:-The Middlemen contact the locals and pay them advances for going to the Forests, cutting Red Sanders trees and bringing the timber logs form the Forests. The locals are paid by weight and the rate varies any where from Rs.20/- to Rs.40/- per Kg based on the market demand.
- * Stage 3: Several cycles of transportation and laundering often changing ownership, locations, conveyance and drivers through middlemen.

Concealment in agricultural field and under some agricultural produce



- * Stage 4:- Final transport of Red Sanders logs normally concealed under some agricultural produce or under animal dung or rotten onions and transport to Chennai or other places by road.
- * Stage 5:- The material either in log form or in converted form is transported to various destinations with in the country or outside the country.

Vehicles Used

International

Exit Point Vulnerablity Analysis

Borders with Nepal and Myanmar appear to be currently active with reference to smuggling of Red Sanders. Amongst the exit points the forms vary as below: *Land Frontiers – Logs

- *Air Purportedly Value added forms
- * Sea Logs, Purportedly valued added forms
- * ICD A New front, Logs

Improper Documentation

- * Fake / Altered Transpit Permit / Certificate of Origin
- * Fake / Altered CITES Documentation-Removal of additional sheets to beat quantitative sealing
- * Documents from authorities not competent or not having original jurisdiction

Documents from authorities not competent or not having original jurisdiction

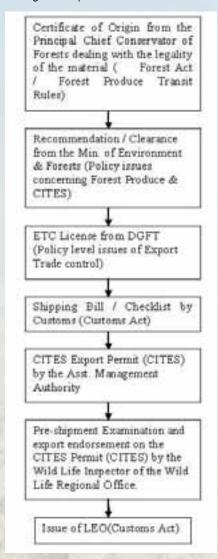
Fake CITES Permit





Methodology for Legal Export of Red Sanders

The export of Red Sanders in all forms including extracts and other derivatives involves broadly the following seven processes.



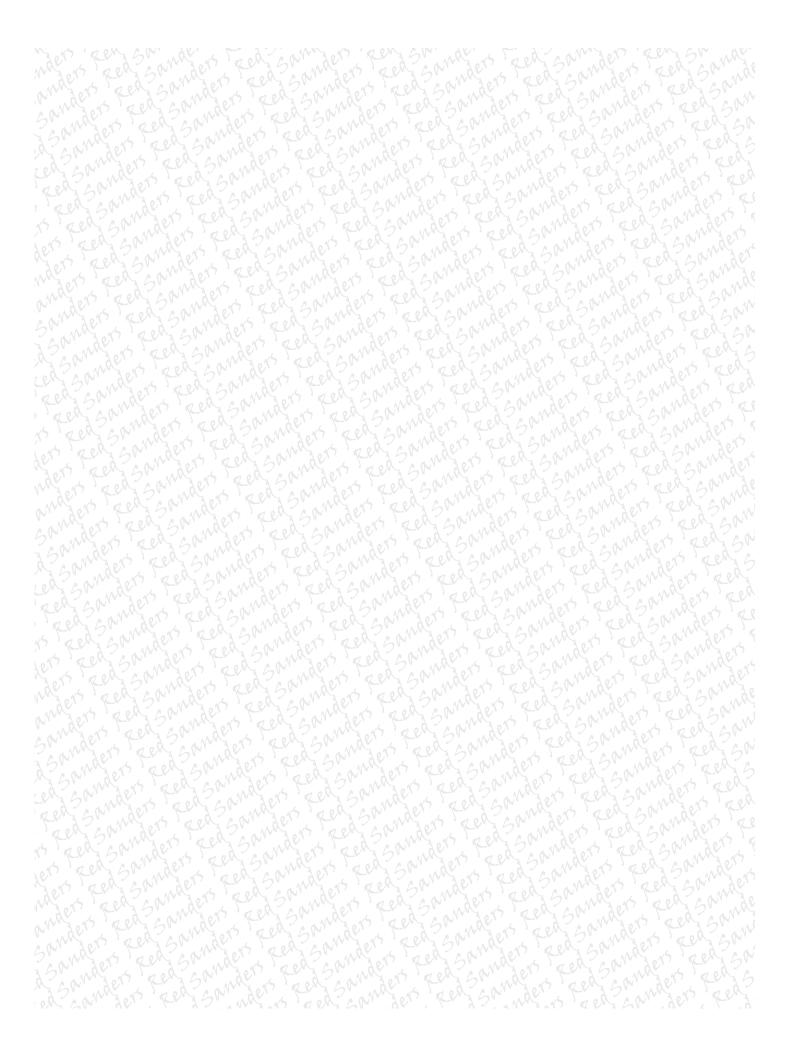
Each of the above is a specialized process with specific scope and mandate under a specific law. Further each step is linked through a conditionality of necessity but not sufficiency to the subsequent step in view of the specializations. For example, a Certificate of Origin is necessary for issuing of a recommendation / clearance to the DGFT, but not sufficient, meaning that the completion of an earlier process is essential but does not automatically enable completion of the next stage process. Each specialist enforcer has to thus look for completion of the prior processes before examining the export proposal from his own specialized perspective.

Some Action Points for Enforcers

In view of the species having purely transnational demand, exit point control represents the most important enforcement strategy.

- Better regulation of Factory stuffing especially in respect of first time consignors and by regular consignors, but at unusual locations
- Mandatory examination for correct species identification of consignments of wooden articles irrespective of species declared by consignor
- Examination of handicrafts / MI parts to check whether they really represent such musical instrument parts/handicrafts or just morphs of sawn timber
- Issue of Certificate Of Legal Origin with reference to the end product proposed for export and not just the purchase of logs/chips etc in raw form at the time of auction prescribing a definite time period of validity for COO
- Exchange of information on COO's granted by various State Forest Departments with exit point agencies.
- Thorough scrutiny of the legality of the end produce and its form, not just the
 procurement of logs, before recommending the grant of clearance/license
 and such documentation to have photo and detailed description of handicraft
 articles being permitted for export.







Medicinal Plants











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1. Beddomes cycad/Perita/Kondaitha

Scientific Name : Cycas beddomei

Vernacular Name: Beddomes Cycad, Perita,

Kondaitha

Family & Distribution: Cycadaceae Cuddapah Hills in AP, North West of Chennai in Eastern Peninsular India.



The male

cones of the plant are used by local herbalists as a cure for rheumatoid arthritis and muscle pains. Fire resistant property is also there.



W(P)A Schedule VI



2. Blue vanda/Autumn Ladies' Tresses Orchid

Scientific Name : Vanda coerulea

W(P)A Schedule VI CITES Appendix

Ivernacular Names: Blue Vanda, Autumn, Ladies' Tresses Orchid, Vandar

Vandaka, Kwaklei, Bhatou Phul (Assamese) etc.

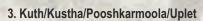
Family & Distribution: Orchidaceae

INDIA: Assam, Arunachal Pradesh, Manipur, Meghalaya,

Nagaland. MYANMAR, THAILAND

Uses

This genus is one of the five most horticulturally important orchid genera. Vanda coerulea is one of the few botanical orchids with blue flowers (actually a very bluish purple), a property much appreciated for producing interspecific and intergeneric hybrids.



Scientific Name: Saussurea lappa/Saussurea costus

W(P)A Schedule VI CITES Appendix I

Vernacular Names: Kuth, Kustha, Pooshkaramoola, Uplet, Kashmjirja, Pokharmool,

Family + Distribution: Asteraceae/Compositae 2600-3600 M Altitude in the Himalayan Region, Kashmir, Himachal Pradesh.

Saussurea lappa is used as an anti-inflammatory drug, and a component of the traditional Tibetan medicine The roots of the plant are used in perfumery. Dry roots (Kuth, Costus) are strongly scented and yields an aromatic oil, which is also used in making insecticides. The roots contain an alkaloid, 'saussurine', which is medicinally important. It is an antiseptic,







Used in chronic skin diseases, asthma and high blood pressure and also good for stomach ailment. Also used as carminative, stimulant, prophylactic and sedative. Dry roots constitute the drug 'Saussurea'. The

roots have strong and sweet aromatic odour and a somewhat bitter taste. In Kashmir the roots are used to protect woolen fabrics. Kuth is also distilled for its essential oil. Approx. 100 kg of oil / resinoid is produced in India.

Commercial / EXIM data:

Roots used to be exported to China, Japan and Europe. Kulu is the biggest centre of trade for Kuth. The kuth roots are

collected and supplied to State Trading Corporation by the

State Forest Department and the same from Lahul is collected by Lahul Kuth Grower's Society, Manali and supplied to State Trading corporation. Presently Kuth roots are mostly exported to HongKong, France and Singapore. It is also exported to Thailand, Vietnam, Japan, Siberia and Netherlands. Kuth exported to Europe, primarily France & Netherlands is used for oil production. Export to France started in 1964-65, whereas Japan in 1965-66 with steadily

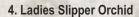
increasing trends. Regarding price of Kuth roots,

average export price during 1965-70 was Rs. 2.65/kg, which later increased to Rs. 7.85/kg. Export price varies during a particular period varies among different countries. Export price to Thailand was highest, Rs. 9.77/kg during 1970-74 and tothat of Singapore was Rs. 6.44/kg.

Adulteration of Kuth oil:

Kuth oil is adulterated with oil of vetiver due to their similar physico-chemical properties, which can be detected by their odour. Oil from the roots of Inula

helenium is also used for adulteration of Kuth oil. True resinoid is sometimes adulterated with resins from roots after extracting oil with steam.



Scientific Name : Paphiopedilium spp. Vernacular Names : Ladies Slipper Orchid

Family & Distribution: Orchidaceae South China, India, South East Asia,

Pacific Islands.





W(P)A Schedule VI

CITES Appendix I

Uses

These types of orchids are mainly used as collector's items but lady's slipper is sometimes used today either alone or as a component of formulas intended to produce treat anxiety / insomnia (scientific evidence is not present). This is also sometimes used topically as a poultice or plaster for relief of muscular pain.

5. Pitcher plant

Scientific Name : Nepenthes khasiana

IVernacular Names: Pitcher Plant, Tiewrakot, Kset Phare, Memang

Koksi.

Family & Distribution: Nepentheceae Endemic to Khasi Hills, Isolated populations are known to occur in Jarain Area of Jaintia Hills and the

Uses

The plant finds ethnomedicinal uses. Khasi and Garo tribes use the fluid of unopened pitcher of the plant as eye drops to cure cataract and night blindness, and also for treating stomach troubles, diabetes and gynaecological problems.

6. Red vanda

Scientific Name: Renanthera imschootiana Red Vanda, Imschoot's Vernacular Names:

Renanthera Kwaklei Angangba, etc.

Family & Distribution : Orchidaceae Manipur, Assam, Burma, Southern China, Laos, Vietnam.



Uses

As a whole orchids are collected to

satisfy an ever demanding market of orchid fanciers, especially in Europe, North America and Asia. The trade is aimed at specially selected hybrids as well as botanical species.

7. Sarpagandha

Scientific Name: Rauvolfia serpentina

CITES Appendix II Vernacular Names: Chandrabagha, Chota chand (Hind.); Chandra (Beng.); Asrel (Urdu); Harkaya, Harki (Mar.); Paataala goni, Paataala garuda (Tel.); Chivan amelpodi (Tam.); Sarpagandhi, Shivavabhiballi, Sutranavi, Patalagondhi (Kan.);Chuvanna-vilpori, Suvapavalforiyan (Mal.); Patalgarur, Sanochada (Oriya).

Family & Distribution: Apocynaceae Sub Himalayan tract from Punjab eastwards to Nepal, Sikkim, Bhutan and Assam, Lower Hills of Gangetic Plains, Eastern & Western Ghats, parts of Central India & in the Andamans.



W(P)A Schedule VI CITES Appendix I



W(P)A Schedule VI CITES Appendix I

W(P)A Not Listed







Uses

Rauvolfia roots are of immense medicinal value and has steady demand. It is used for treating various central nervous system disorders. The pharmacological activity of rauvolfia is due to the presence of several alkaloids of which reserpine is the most important, which is used for its sedative action in mild anxiety states and chronic psychoses. It has a depressant action on central nervous system produces sedation and lowers blood pressure. The root extracts are used for treating intestinal disorders, particularly diarrhoea and dysentery and also anthelmintic. It is used for the treatment of cholera, colic and fever. The juice of the leaves is used as a remedy



for opecity of the cornea. The total root extracts exhibits a variety of effects, viz., sedation, hypertension, brodyeardia, myosis, ptosis, tremors, which are typical of reserpine.

8. Ceropegia species.

Scientific Name: Ceropegia sp.

Vernacular Names: Lantern Flower, Parasol Flower, Parachute Flower, Bushman's Pipe, String of Hearts, Snake Creeper, Wineglass Vine, Rosary Vine, Necklace Vine, etc.

Family & Distribution: Apocynaceae Canary Islands, Africa, Madagascar, Arabia, India, Sri Lanka, Southern China, Indonesia, Philippines, New Guinea. Queensland.

Uses

Since these plants are very popular houseplants, these plants can be used as ornamental plants.

9. Shindal Mankundi

Scientific Name : Frerea indica Vernacular Names : Shindal Mankundi

Family & Distribution: Apocynaceae/Asclepiadaceae INDIA: Junnar and Purandhar Hills, Pune, Maharashtra Endemic.

Uses

Freria indica with sherry flowers have demand as a pretty succulent horticulture plant indoor decoration.

W(P)A Not Listed CITES Not Listed



W(P)A Not Listed CITES Appendix II



10. Emodi/Indian Podophyllum

W(P)A Not Listed Scientific Name: Podophyllum hexandrum CITES Not Listed Vernacular Names: Emodi/Indian Podophyllum, Himalayan MayApple, Indian MayApple,

etc. Bakrachimaka, bhananbakra, papra, papri (Hin.); Papra (Beng.); Padmel, patnel (Mar.); Verivel (Guj.); Vaakakri, papri (Punj.); Banwangan (Kash.); Indian podophyllum (Eng.)

Family & Distribution : Berberidaceae Lower elevations in and surrounding the Himalaya.

Uses

Rhizomes and roots constitute the drug.

Freshly collected rhizomes are reported to contain more active principles which are lost on prolonged storing. The dried rhizome from the source of medicinal resin. Podophyllin obtained from the plant is cholagogue, purgative, alterative, emetic and bitter tonic and is given in conjunction with belladonna and hyoscyamus. Podophyllin is toxic and strongly irritant to skin and mucous membranes. Large dose causes severe vomiting and diarrhoea. It is used in veterinary medicine as a cathartic for dogs and cats, also used in removing warts in animals. Cardio-vascular effects of sub-lethal doses of podophyllin are reported to be wild

11. Tree Ferns

Scientific Name: Cyatheaceae spp. Vernacular Names: Tree Ferns

Family & Distribution: Tropical and Subtropical areas as well

Temperate Rainforests in Australia, New Zealand



Uses

The Soft Tree Fern can be used as a food source, with the pith of

the plant being eaten either cooked or raw. It is a good source of starch.

12. Cycads

Scientific Name: Cycadaceae spp. Vernacular Names: Cycads

Family & Distribution: Cycadaceae Stangeriaceae Zamiaceae South and Central America, Mexico, the Antilles, southeastern USA, Australia, Melanesia, Micronesia, Japan, China, Southeast Asia, India, Sri Lanka,

Madagascar, and southern and tropical Africa

W(P)A Not Listed CITES Not Listed









Uses

The generic name refers to the starch obtained from the stems which was used as food by some indigenous tribes. Tribal people grind and soak the nuts to remove the nerve toxin, making the food source generally safe to eat, although often not all the toxin is removed. In addition, consumers of bush meat may face a health threat as the meat comes from game which may have eaten cycad nuts and carry traces of the toxin in body fat. There is some indication that the regular consumption of starch derived from cycads is a factor in the development of Lytico-Bodig disease, a neurological disease with symptoms similar to those of Parkinson's disease and ALS. Lytico-Bodic and its potential connection to cycasin ingestion is one of the subjects explored in Oliver Sacks' 1997 book Island of the Colourblind.



13. Elephant's foot

Scientific Name : Dioscorea deltoidea Vernacular Names : Elephant's Foot, Singli-

Mingli, etc.

Family & Distribution: Dioscoreaceae Throughout the North Western Himalayas extending from Kashmir and Punjab eastwards to Nepal and China at the altitude of 900-3000 meters above msl.

Uses

Commercial source of Diosgenin (a steroid sapogenin, is the product of hydrolysis by acids, strong bases, or enzymes of saponins, extracted

from the tubers of Dioscorea wild yam. The sugar-free (aglycone), diosgenin is used for the commercial synthesis of cortisone, pregnenolone, progesterone, and other steroid products.)



Scientific Name: Euphorbia spp. **Vernacular Names**: Euphorbians, Spurge.

Family & Distribution: Euphorbiaceae Primarily found in the tropical and subtropical regions of Africa and the Americas, but also in temperate zones worldwide. Succulent species originate mostly from Africa, the Americas and Madagascar.

CITES Appendix II

W(P)A Not Listed







Uses



W(P)A Not Listed CITES Not Listed

15. Orchid

Scientific Name : Orchidaceae spp.

Vernacular Names : Orchids

Family & Distribution: Orchidaceae Orchidaceae are cosmopolitan, occurring in almost every habitat apart from deserts and glaciers. The great majority are to be found in the tropics, mostly Asia, South America and Central America, but they are also found above the Arctic Circle, in southern Patagonia and even on Macquarie Island, close to Antarctica.

Uses

The genus Vanilla used as flavouring agent, underground tubers of some orchids are powdered and used for cooking, cultivation for the enjoyment of the flowers, some species used in perfumery

industries, collectors' species.



Orchids are quite popular among professionals as well as amateurs orchid lovers all over the world. Orchid trade is sharing about 8% of international flower market is a very productive with centres concentrated in Europe (the Netherlands), America (California), Japan, Thailand, Bangkok, Singapore. India has rich orchid genetic resources. Orchid cultivation has been initiated by some entrepreneurs at Bangalore, Chandigarh, Gangtok, Mumbai, Chingelpet, Cochin, Ernakulam,

Quilon, Kalimpong, Pune and Thiruvananthapuram. Breeding work has also been initiated at Orchid Research & Development Centre (ORDC); Tipi, Arunachal Pradesh; Tropical Botanic Garden and Research Institute (TBGRI), Thiruvananthapuram, Kerala; Indian Institute of Horticultural Research (IIHR), Bangalore, Karnataka and in some Indian Universities. Orchid trade may be classified into four categories: Plants; species; (iii) hybrids; and cut flowers. The value of orchid plants vary according to the quality of flowers and rarity of occurrence. Some orchids have high demand in international market. Northeast India has got tremendous potential of orchid cut flower trade which may prove to be a fruitful industry in southeast Asia, Australia and Hawaii. The major threat to orchids are due to extraction of wild plants for trade and habitat alteration or destruction. About 147 orchid species are under threat of extinction worldwide, ca 35 species in Indian region (including India, Nepal, Bhutan, Bangladesh, Sri Lanka and Pakistan) are considered extinct or on the verge of extinction and over 100 species are threatened (Pradhan, 1996). In many north east states particularly in Manipur and Meghalaya, rural people collect orchids from the wild and sell them in the market at a very cheap rate for their livelihood.



16. Redsanders

Scientific Name : Pterocarpus santalinus

Vernacular Names: Raktachandan (Hind., Beng.); Tambada chandana (Mar.); Ratanjali (Guj.); Rakta ghandhamu, Agaru gandhamu (Tel.); Atti, Sivaffu chandanam (Tam.); Agslue, Honne (Kan.); Patrangam, Tilaparni (Mal.); Rad Sandal wood, Red Sanders (Eng.).

Family & Distribution : Leguminaceae

INDIA: Parts of Andhra Pradesh, Mysore, Chennai.



The wood is heavily impregnated with reddish

brown gum and contains a red dye santalin. The timber is immune to white ants and other insects and doesnot require

antiseptic treatment. The timber is used for house posts, agricultural implements, poles, shafts and bent rims of carts, boxes and picture frames. They are also

carved into dolls and images. It is exported to Japan where it is used in the manufacture of a musical instrument called Shamisou. The wood yields charcoal and fuel obtained from diseased and crooked trees. The ground wood, roots and stumps is used for dyeing wool, cotton and leather. It is also used for staining other woods. The dye is also used for colouring pharmaceutical preparations and food stuffs. Paste

Chips

W(P)A Not Listed

CITES Appendix II

of the wood is cooling, astringent, tonic and diaphoretic, also useful in bilious affections and skin diseases. Decoction of the fruit is used as an astringent tonic in chronic dysentery. Leaves are used as cattle fodder.

17. Common Yew or Birmi Leaves

Scientific Name: Taxus wallichiana
Vernacular Names: Common Yew, Birmi, etc.
Family & Distribution: Taxaceae INDIA:
Himalayas, Meghalaya Naga hills, Manipur.
MYANMAR, AFGANISTAN, South West CHINA,
VIETNAM.

Uses

Parts used commercially:

Used as hedge, also used in topiary in Europe. In Britain it has been used for making bows and for archery sports. In Ladakh the bark is

used in place of tea. It also used for ploughs and axils of carts. The wood is strong and elastic All parts of the plant are highly poisonous except the scarlet aril. Poisioning results in gastroenteritis, heart and respiratory failure. Sometimes death occurs within 5 minutes.

W(P)A Not Listed CITES Appendix II



18. Agarwood

Scientific Name: Aquilaria mallaccensis

Vernacular Names: Agarwood, Oud, Aloe wood, Eagle wood,

Aguruh, Krsnaguruh, etc.

Family & Distribution: Thymelaeaceae

INDIA: Nagaland, Manipur, Mizoram, Meghalaya, Assam, West Bengal MYANMAR, extends through South East Asia to

PHILIPPINES.



Uses

Wood is stimulant, tonic, aphrodisiac, carminative, astringent, also used in diarrhoea, constipation, vomiting and snakebite. Agar

is a pathological product, formed due to a fungal disease on wound or boring in the trunk, the fluid

resin does not exude naturally or on tapping.

Trees, about 50 yrs old, have the highest concentration of agar. Sometimes all the tissues under the bark of the tree may be converted into agar. True agar is heavier than water, and is hard, brown and rich in resin. Agar is sold in the market as chips, splinters and blocks. Sylhet agar has the highest price; Dhum, of inferior quality, is softer and yellowish-white, and is used distilling volatile oil called agar attar. Clothes and skins dusted with agar powder repel fleas



W(P)A Not Listed CITES Appendix II

and lice. Agar is a stimulant and carminative. The wood used for making bows and sticks. It is also highly scented and yields on distillation, agar attar. The resinous wood is used for making incense sticks. The wood is also used by cabinet makers and inlayers for making beads, rosaries, crucifixes, ornaments, etc.

19. Aconite/Monkshood/Wolfsbane

Scientific Name: Aconitum sp.

Vernacular Names: Aconite, Monkshood, Wolfsbane, Atees,

Family & Distribution: Ranunculaceae Found in sub-alpine

and alpine regions; Himalayas from

Indus to Kumaon



Uses

Aconitum is a valuable herb for combating debility after fevers. It is an excellent tonic and aphrodisiac. It is used as a remedy for diarrhea, dysentery, acute inflammatory affections, cough, and dyspepsia.

W(P)A Not Listed CITES Appendix II







20. Yunnan Goldthread

Scientific Name: Coptis teeta



Vernacular Names: Yunnan Goldthread Family & Distribution: Ranunculaceae It is endemic to a very small area in the eastern Himalayas.

Uses

Rhizome is used as an antimicrobial and anti-inflammatory



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21. Calumba wood (Coscinium fenestratum).

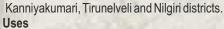
Scientific Name: Coscinium fenestratum

Vernacular Names: Calumba Wood, Jhar Haldi (Hindi), Maradrashina (Kannada), Jhadehalade (Marathi), Darvi (Sanskrit), Manu pasunu (Talagu)

Manu-pasupu (Telegu).

Family & Distribution: Menispermaceae Global: Indo-Malaya (southern India, Sri Lanka, Cambodia and West Malaysia). National: Western Ghats of Karnataka, Kerala and Tamil Nadu. Regional: In Karnataka, occurs in the dense semi-evergreen forests of Coorg, Uduppi, Dakshina and Uttara Kannada districts. In Kerala, found in semi-evergreen and evergreen forests of

Thiruvananthapuram, Thrissur, Wynaad, Idukki and Palakkad districts. In Tamil Nadu, occurs in





Stem is anti-inflammatory and antiseptic. Used to treat tastelessness, bleeding piles, cough, wounds, ulcers, skin diseases, abdominal disorders, jaundice, liver disorders, intrinsic haemorrhage, diabetes, snake bite, fever and general debility.

W(P)A Not Listed CITES Not Listed



22. Marsh Orchids

Scientific Name: Dactylorhiza hatagirea

Vernacular Names: Marsh Orchids Salem Panja (Kashmir),

Hatajari (Uttaranchal), etc.

Family & Distribution: Orchidaceae Temperate to alpine regions

(2500-5000 m asl) in India, Pakistan & Nepal.



Uses

The tuber is used as nervine tonic, aphrodisiac and to relieve hoarseness. Salep, obtained from tubers of D. hatagirea, is used as a sizing material in silk industry.

W(P)A Not Listed CITES Not Listed



23. Kuru/Kutki

Scientific Name: Gentiana kurroo Vernacular Names: Kuru, Kutki, etc.

 $\textbf{Family \& Distribution} \ : \ Gentianaceae \ E. \ Asia-N.W. Himalayas.$

Uses

The root is anthelmintic, anti-inflammatory, antiseptic, bitter tonic, cholagogue, emmenagogue, febrifuge, refrigerant, stomachic. It is taken internally in the treatment of liver complaints, indigestion, gastric infections and anorexia. It should not be prescribed for patients with gastric or duodenal ulcers.

W(P)A Not Listed CITES Not Listed



W(P)A Not Listed CITES Appendix II



24. Gnetum species.

Vernacular Names : Kuru, Kutki, etc. Scientific Name : Gnetum spp.

Vernacular Names : Mamelet (Ass.); Thaulping-rhui (Lusai, Mizo);

Mailar-iong-une (Khasi); Ula (Mal.); Umlli (Mar.); Lolori (Ori).

Family & Distribution: Gnetaceae

INDIA: Eastern Himalayas from Sikkim, Assam, Arunachal Pradesh, Bihar, Orissa to the Andamans, western India and Tamil Nadu. Thailand, China, Vietnam, Nepal.

Ileas

Stem and roots are antiperiodic. Seeds produce oil for massage for rheumatism. Plant is also used as fish poison.



25. Kencur/Aromatic Ginger

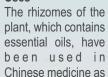
Scientific Name: Kaempferia galanga

Vernacular Names: Kencur, Aromatc Ginger, Zedoary, etc.

Family & Distribution : Zingiberaceae.

Open areas in southern China, Taiwan, Cambodia and India, but is also widely cultivated throughout Southeast

Asia. **Uses**



a decoction or powder for treating indigestion, cold, pectoral and abdominal pains, headache and toothache. Its alcoholic maceration has also been applied as liniment for rheumatism.



W(P)A Not Listed

CITES Not Listed

26. Jatamansi

Scientific Name: Nardostachys grandiflora

Vernacular Names: Jatamansi (Sans.); Jatamansi, Bal-chir (Hind.); Jatamansi (Beng.); Jatamanshi (Mar.); Jatamasi, Kalichhad (Guj.); Jatamanshi (Tel., Kan. & Mal.); Bhutijatt, Kukilipot (Kash.); Masi (Garh.); Haswa, Naswa, Jatamangsi (Nepal); Pampe, Jatamansi (Bhutan), SPIKENARD

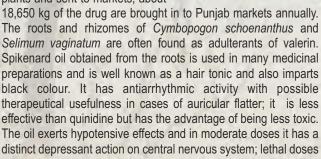
Family & Distribution: Valerianaceae

INDIA: Himalayas, Punjab to Sikkim. TIBET, BHUTAN, WEST CHINA.

Hene

The rhizomes are used as a drug and also in perfumery. The

rhizomes are collected from wild plants and sent to markets; about



cause deep narcotic and ultimately death within a few hrs. The rhizome is a stimulant, antispasmodic, diuretic, stomachic, laxative and tonic. An infusion of rhizome is useful in epilepsy, hysteria, palpitation of heart. A tincture is given in colic and





27. Ginseng

Scientific Name: Panax pseudoginseng

Vernacular Names: Notoginseng



Family & Distribution : Araliaceae China & Japan.

Uses

It has acquired a very favorable reputation for treatment of blood disorders, including blood stasis, bleeding, and blood deficiency

W(P)A Not Listed CITES Not Listed



W(P)A Not Listed

28. Picrorhiza kurrooa.

Scientific Name: Picrorhiza kurroa

CITES Appendix II Vernacular Names: Kuru, Kutki (Hin. & Beng.); Kutaki (Mar.); Kadu (Guj.); Katukarogani, Kadugurohini (Tel., Tam., Mal.); Kaur (Kash.); Karru (Punj.); Katuka katurohini (Sans.); Kuruwa

Family & Distribution:

Scrophulariaceae INDIA: Himalayas - Jammu & Kashmir to Sikkim. NEPAL and extending to the mountains of YUNNAN in CHINA.

Uses

(Garh.).

The drug Picrorhiza (Greek: picros means bitter; rhiza means root), obtained as dried rhizomes, consists of cylindrical, dark greyish

brown pieces, usually 3 – 6 cm long and 0.5 – 1 cm dia., longitudinally wrinkled with annulations at the tip. It is a highly potential medicinal herb extensively used in various ailments and diseases both in India and abroad since ancient times. Both white and black varieties are used in herbal medicines and drugs. The drug is useful in cases of dropsy. It is stomachic, cardiac and cerebral tonic, antipyretic, anthelmintic, laxative in small doses, antiemetic, cathartic in large doses; useful in bilous fever, dyspepsia, urinary trouble, asthma, hiccough, blood circulation, burns, liver complaints, paralysis, epilepsy, ringworm infection, scabies and gout.





29. Charayatah

Scientific Name : Swertia chirata Vernacular Names : Chiraytah

Family & Distribution: Gentianaceae Endemic to Khasi Hills, Isolated populations are known to occur in Jarain Area of Jaintia Hills and the Baghmara Area of Garo Hills, adjacent to the Khasi Hills region of Meghalaya.

Uses

S. chirayita is used in British & American pharmacopoeias as tinctures and infusions. According to Ayurvedic pharmacology chirata is described as bitter in taste. The thermal action of chirayta is defined as cooling. Chirata is light, i.e. easily digestible and "ruksha" i.e. dry. These characteristics drain heat from blood and liver.

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trade through FOREIGN POST OFFICE

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Wildlife Trade through Foreign Post Office in India

Introduction

Smuggling or trafficking of wildlife articles through Foreign Post Offices is perhaps the most common strategy adopted by the unscrupulous traders. Since booking of postal parcels in fictitious name is very easy and content of the parcel is not verified at the receiving counter of the Post Offices under the existing Postal Rules. The illegal traders feel it safe to dispatch contraband wildlife articles through postal parcels under false declaration. Moreover, even if such parcels are intercepted at a later stage by the Law Enforcement Agencies it becomes very difficult to trace out the actual culprits in absence of genuine address. Also, it has been observed that light weight wildlife articles such as feathers of birds, butterflies, insects; rare medicinal herbs etc. are dispatched as letter mail parcels to avoid detection by the Customs as letter mail parcels are hardly opened by the Customs at the exit points by default. During the past ten years hundreds of postal parcels were detained containing contraband wildlife articles like ivory article, tiger nail, bison and deer/wild sheep/goat horns, butterflies, mongoose hair brushes, snake, lizard skins, medicinal herbs, seeds, orchids, agarwood, red sanders wood, sea shells etc. A change in the trend of smuggling has also been noticed. So, a detailed analytical study will reveal the loopholes in the system and in the present legislation of the Govt.

Postal Provisions regarding Parcels:

In India, there are four FPOs at New Delhi, Kolkata, Chennai and Mumbai and four Sub FPOs at Bangalore, Ahmedabad, Jaipur and Cochin. FPOs are guided by the Indian Post Office Act, 1998. Chapter-V of the said Act (section 23, 24, 25 and 26) are relevant to regulation of the transmission of articles. These provisions are used by the Postal Authority to deliver such

articles to Customs authority (section 24 A) for Regulation with regard to restricted/prohibited articles. There are penal provisions delineated in Chapter-X.

There is no provision regarding identification of the person at the time of booking of postal of letter/ parcels except that of reputed firms sending parcels along with invoices and declarations in form CN-23.

The weight of an un-registered parcel should not exceed 4 kgs, the weight of registered parcel should not exceed

- 10 kgs if posted at or addressed to, a branch post office, and
- 20 kgs in other cases. Accordingly postages are charged by the Postal Dept. and for sending by speed post and airmail different postage valuations are there for affixing on the parcels/letters.

Nowadays with liberalized policy and for bringing profits Postal Department has been floating different customer friendly initiatives to capture more shares in the postal cargo market and beating competition with the Private Courier Services. One such initiative is the Logistic post which is just like private transport business of Cargo.

Role of Customs:

Once the out bound/in bound letters/parcels are received; a list is prepared and is placed before the Customs, PAD (Postal Appraising Department). For most of the export parcels there is no cess or fee. For import/in bound parcels there is cess or fee and customs officers appraise that amount and the importer has to pay that to the postman who is delivering the parcels.

Customs officers as per Customs Act see for each parcel being booked has to carry a customs declaration form i.e. CN-23. However, in many cases the CN-23 is missing. As per the Customs Act, 1962- section 82, 83 & 84;



declaration of the goods is necessary for both export and import of materials through FPO. Once, the list is received from FPO by the Customs, the Customs checks them and either release or detained them taking account of the Customs Act and Foreign Trade Policy for prohibited and restricted items such as wildlife articles, artifacts including archaeological items, agriculture/ animal husbandry products requiring certificate from Plant Quarantine etc. and are referred to the respective agencies for examination and certification in the register of the Customs Department at PAD. For the wildlife and plant products, the regional offices of WCCB takes up the examination work through Wildlife Inspectors.

Role of WCCB

Once the requisition is placed by the customs authority at PAD, the wildlife Inspectors visit the FPO and after checking the parcels give their opinion and advice for releasing/detaining for further documentation/seizure of the items involving animal and plant products. Customs department at PAD inform/intimate the wildlife department about the wildlife related articles and require the assistance in identifying the doubtful materials. However, of late, the system has been changed and they are placing requisition in writing for inspection of the materials to the regional offices. While examining the parcels containing flora and fauna, the Inspectors give their opinion in the light of CITES, Wildlife (P) Act, 1972 and provisions in the Foreign Trade Policy (FTP). The required documents are sought as per the provisions of the CITES/FTP before giving NOC and sometimes a note is put to RDD in cases involving wild animals/plants included in the Schedules of the Wildlife (P) Act, 1972 or contravention of the CITES provisions for writing to the Customs Authority for confiscation the goods and taking strict legal action.

The parcels containing wildlife, exports of which are prohibited as per FTP are detained and recommended for legal action by customs. For most of the

parcels containing wildlife which do not come under WLPAct, 1972 i.e. dry parts of plants like stem, fruits, flowers etc. and handicrafts made from twigs, agricultural by-products made into decorative items and sometimes seeds of flower/plants, seashells and domesticated buffalo horn products are examined, identified tallied with declaration for which relevant chapters of FTP is referred and the documents like customs declaration, invoice, packing list and an affidavit with regard to the seeds not containing foundation/breeder seed etc. along with Phytosanitory certificate of the Plant Quarantine dept. is also asked for. Copies of these documents are

Data Analysis

1. Number of Wildlife related cases detected at FPO (WLPA, 1972; CITES; Exim Policy)

Year	No. of Cases		
2005	18		
2006	15		
2007	25		
2008	91		
2009	66		

In view of the trends, it is necessary to subject to consignments at FPOs to thorough checking in order to control illegal international wildlife trade.

2. Categories of Wildlife in Trade

Year	Mammals	Reptiles	Amphibians	Birds	Fishes	Sea Shells	Plants		
	No. of Cases								
2005	2	Nil	Nil	5	2	9	Nil		
2006	2	1	Nil	2	1	20	Nil		
2007	5	1	Nil	7	1	18	Nil		
2008	3	1	5	15	1	8	52		
2009	2	2	3	1	30	13	49		





From the above table, it is revealed that the banned items of wildlife are in trade through FPO in India. Sea shells, articles of birds, plants etc are commonly traded through post parcels. Therefore, it is clear that the FPO is used to trade small wildlife species, their articles/parts & products as these are traded in letter parcels to avoid any kind of suspicion.

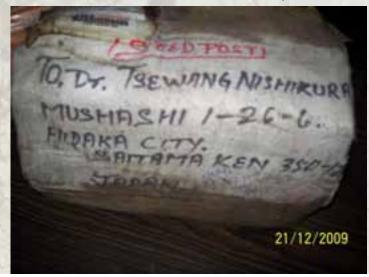
Conclusion:

It is observed that small articles of wild fauna and flora are traded through FPO. Dried snakes, fishes, sea shells, dried herbal plant products and other such small articles that can be posted as letter parcel are mainly in trade through this channel to avoid any kind of suspicion.

Way Ahead:

- Need for awareness including sensitization of field personnel of post offices.
- Basic measures to be adopted
- Checking/physical inspection
- Ensuring the correct identity of sender.
- Proper identification of parts and products-obtaining declaration CN 23.





Photograph 2: Address of Consignee on Postal Parcel No-*EE06253967IN*



Photograph 3: Address of Consignor on Postal Parcel No-EE06253967IN





Photograph 4: Dried Snakes in Postal Parcel No- EE06253967IN



Photograph 5: Dried Snakes in Postal Parcel No- EE06253967IN



Photograph 6: Dried Snakes in Postal Parcel No- EE06253967IN

21/12/2009

Photograph 7: Dried Snakes in Postal Parcel No-EW013909673 IN





Photograph 8: Dried Snakes in Postal Parcel No-EW013909673 IN



Photograph 9: Postal Parcel containing dried frog



Photograph 10: Dried Frog in Postal Parcel



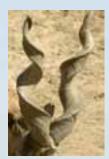
Photograph 11: Postal Parcel



Wildlife parts & products in trade



Mammalian Antlers in Trade



Capra falconeri antler



Rucervus duvaucelii/Cervus duvaucelii antler



Cheetal antler



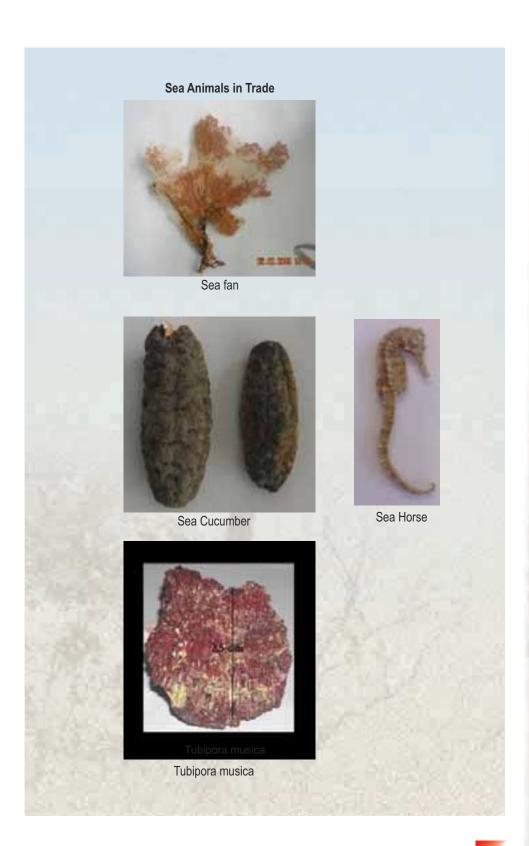
P.hodgsonii antler



Stag Horn articles



Samber antler







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