

# BIODIV News

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Soft Corals



## Contents

1. Coastal and Marine Biodiversity of India (Source: K. Venkataraman)	2-7
2. Sea Turtles: Pratibha Singh	8-9
3. Marine Biodiversity Competitions	10-11
4. International Day for Biological Diversity-2012	12-16
5. World Environment Day	17
6. Newspaper Clippings	18-23
i) International News	18
ii) National News	19
iii) State News	21

## Editorial

### Esteemed Readers,

Summer is here and along with it is the celebration of the International Day for Biological Diversity. Though the state of Uttar Pradesh has no coasts and is a land locked state, we feel the need to spread awareness about the importance of marine biodiversity and ocean in our daily lives. We wish to bring awareness about the "ecosystem services" that oceans provide. People usually associate the worth of the ocean based on the resources it provides fish to eat, sand, gravel, minerals, oil and natural gas. But these resources are dwarfed by the value of the unrecognized services-regulation of the earth's climate right from rainfall, oceans currents, to treating waste.

Vast and awe-inspiring, seemingly limitless and indestructible, the oceans have been the ultimate depository for humanity's wastes since time immemorial. For even longer, their waters and coasts have provided an apparently inexhaustible bounty of fish and other resources. About 50% of the oxygen comes from the tiny phytoplankton present in the ocean.

Almost all of the problems of the oceans start on land. It is here that virtually all of the pollution originates, whether it is sewage or wastes dumped into the ocean or from fertilizers and pesticides washed into rivers and down to the sea, or from metals and chemicals emitted from car exhausts and industry and carried by the winds far out to the oceans or plastic dumped thoughtlessly. Human activities on land from covering wetlands with rubbish to selling curios from coral reefs, from felling mangrove forests to changing coastlines- put most of the pressure on the ecosystems marine environments.

At the COP 10 held at Nagoya in 2010 the Aichi Biodiversity targets were adopted, these are twenty in number. Out of these target 6 aims at avoiding overfishing, target 10 aims at minimizing oceans acidification and target 11 aims at conserving 10% of coastal and marine areas that are of particular importance for biodiversity and ecosystem services. The theme of the conference this year is "Marine Biodiversity-One ocean many worlds of life". Looking forward to discovering more about the wonders of the oceans this quarter with all of you!

– Editor

# 1-Coastal and Marine Biodiversity of India

(Source: K. Venkataraman\*)



*Oxycomanthus bennetti*

India has a coastline of about 8000 km and a very wide range of coastal ecosystems such as estuaries, lagoons, mangroves, backwaters, salt marshes, rocky coasts, sandy stretches and coral reefs. The dissimilarities between the west and east coasts are remarkable. The west coast is generally exposed with heavy surf and rocky shores and headlands whereas the east coast is generally shelving with beaches, lagoons, deltas and marshes.

## Diatoms

A total of 102 species of diatoms belonging to 17 families are known from the east coast, with the largest diversity pertaining to Naviculaceae (21 spp). The diatom diversity along the west coast is relatively higher, with 148 species under 22 families. Naviculaceae among them is the dominant with 22 species.

## Dinoflagellates

Dinoflagellate species diversity in the east coast estuaries is relatively small (15 species in 7 families) compared to the west coast estuaries (76 species from 10 families).

## Marine Algae

Marine algae from Indian coasts have been fairly well surveyed since several decades. The

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\* Zoological Survey of India, Kolkata. Edited by Dr. Somesh Gupta, U P State Biodiversity Board, Lucknow

latest systematic account lists 844 species distributed among 217 genera. The most abundant among them are rhodophytes (434 species), followed by chlorophytes (216 species), phaeophytes (191 species) and xanthophytes (3 species).

## Sea Grasses

Fourteen species of seagrasses under 6 genera are known from Indian seas.

## Mangroves

The Indian mangroves cover about 4827 km<sup>2</sup>, with about 57% of them along the east coast, 23% along the west coast and the remaining 20% in Andaman and Nicobar Islands. The mangrove formations are of three types - deltaic, backwater-estuarine and insular. A total of 39 mangrove species are known from India. One *Lumnitzera littorea*, is present only in the Andaman and Nicobar Islands.

**Table 1. The diversity of marine flora and fauna of India (+ estimated to be more).**

Taxa	No. of Species	Taxa	No. of Species
PLANTA		Chaetognatha	30+
<b>PLANTS</b>		Tardigrada	10+
Diatoms	200+	<b>Arthropoda</b>	
Dinoflagellates	90+	<b>Crustacea</b>	
Algae	844	Copepoda	1925+
Rhodophyta	434	Ostocoda	120+
Phaeophyta	191	Branchiura	5+
Xanthophyta	3	Cirripedes	104
Chlorophyta	216	<b>Malacostraca</b>	
<b>Sea grasses</b>	<b>14</b>	Mysidacea	75
<b>Mangroves</b>	<b>39</b>	Cumacea	30
<b>PROTISTA</b>		Tanidacea	1+
<b>Protozoa</b>	<b>532+</b>	Isopoda	33+
Foraminifera	500+	Amphipoda	139+
Tintinids	32+	Euphasacea	23+
<b>ANIMALAE</b>		Stomatopoda	121
Porifera	486+	<b>Decapoda</b>	
Cnidaria	842+	Macrura	55+
Hydrozoa	212+	Brachyura	705+
Scyphozoa	25+	Anomura	162
Cubozoa	5+	Mollusca	3370
Anthozoa	600+	Bryozoans	200+
Ctenophora	12	Echindodermata	765
<b>Annelida</b>		<b>CHORDATA</b>	
Achianeellida	20	Hemichordata	12
Polychaeta	250+	Protochordata	119+
Sipuncula	35	Fishes	2546
Echiura	33	Reptiles	35
		Mammals	25



## **Protozoa**

The known number of protozoan species from Indian seas is 2577, equivalent to about 8% of the total world protozoan fauna.

## **Sponges**

486 species have been described in India. The sponge fauna of India is dominated by species of Desmospongia followed by those of Hyalospongiae and Calciospongiae.

### **(i)-Cinadiria**

In India 212 species of Hydrozoa, 25 species of Scyphozoa, 5 species of Cubozoa and 600 species of Anthozoa have been reported till now.

### **(ii)-Hydrozoa**

The first description of hydrozoans in India was by Annandale from Chilka Lagoon.

### **(iii)-Siphonophora**

Siphonophora are abundant in the Indian seas and constitute an important part of the marine plankton. A comprehensive account of Siphonophora of India shows 116 valid, one variety and 3 doubtful species known from the Indian Ocean of which 89 occur in the Indian Seas.

### **(iv)- Anthozoa: Scleractinia**

Studies on taxonomy of Indian coral reef started in India as early as 1847. 8 species of Acropora from Rameswaram, South East coast of India, out of which *A. multicaulia*, *A. thurstoni* and *A. indica* were described as new.

### **(v)-Scyphozoa: Scyphomedusae**

Out of the 200 species of Scyphomedusae known from the World Oceans, 34 are known from the Indian Seas.

### **(vi)-Ctenophora**

Only 12 species of Ctenophores, among the 100-150 species known from the world ocean, occur in the Indian seas.

## **Annelida**

About 20 species are reported from Indian coasts.

### **(i)-Polychaeta**

The catalogue of the polychaetous annelids from India lists 883 species.

### **(ii)-Oligochaeta**

Marine Oligochaete fauna is poorly known in India. As compared to the world fauna, only 3% of enchytraeid species have so far been reported from this region, mainly from Orissa.

### **(iii)-Sipuncula**

Of the 145 species under 17 genera known from the world oceans, 35 species under 10 genera and 5 families occur in the Indian coasts. So far as the distributional pattern of the sipunculan fauna is concerned the major areas of species concentration are Andaman and Nicobar Islands, Lakshadweep Islands, Gulf of Mannar and Gulf of Kachchh.

### **(iv)- Echiura**

The phylum Echiura comprises of 127 species under 32 genera and 5 families. Indian echiuroids so much that the current inventory of 33 species under 11 genera is fairly rich in comparison with what is known (43 species under 14 genera) from the Indian Ocean.

### **(v)- Chaetognatha**

Chaetognaths (arrow worms or glass worms) rank second in terms of abundance after copepods



in marine zooplankton and are cosmopolitan in distribution. Among the 120 species known from the world oceans, about 30 are reported from the Indian Seas.

#### **(vi)- Tardigrada**

Among the three orders of the Phylum Tardigrada, the Heterotardigrada is found in marine, freshwater and high altitude mountains. So far 214 species are reported from the world under five families and 20 genera. However in India only 10 species under two families and three genera have been reported.

### **Arthropoda: Crustacea**

In India as many as 139 species of stomatopods (4 families and 26 genera), 26 species of lobsters (4 families, 11 genera), 162 species of hermit crabs (3 families, 40 genera), 705 brachyuran crabs (28 families, 270 genera), 84 species of shrimps and prawns (7 families, 19 genera) and 159 species of Caridea (15 families, 56 genera) have been recorded so far.

#### **i) Copepoda**

Copepods are the most widely studied group among the marine zooplankton. A total of 106 species belonging to 23 families are known from the east coast estuaries. Among them the calanoids are the dominant, distributed in 16 families, followed by harpacticoids (5 families) and cyclopoids (2 families).

#### **ii) Ostracoda**

The Ostracoda are one of the most successful aquatic crustacean groups with approximately 8000 living species. Only 60+ species of ostracods are known from the Indian coast of which 38 species are known from the east coast and 28 species from the west coast.

#### **iii) Branchiura**

Our knowledge of this group from the Indian region is rather scanty. Five species of the genus *Argulus* are reported of which three were described as new to science. Argulids are found parasitic on fishes.

#### **iv) Cirripedes**

Information on the diversity of Cirripedia of Indian coast is far from complete, with only 36 species having been recorded so far.

### **Malacostraca:**

#### **i) Mysidacea**

Mysidaceans, with a total number of about 75 species, are known so far only.

#### **ii) Cumacea**

Altogether 23 species of Bodotriidae, 3 species of Disstylidae, 4 species of Nannastaeidae and one species of Camylaspididae are known from the Indian region.

#### **iii) Tanaidacea**

Our knowledge of Tanaidacea is rather poor from the Indian region. A few of these are reported from the Chilka Lake.

#### **iv) Isopoda**

Very little is known about the marine isopods when compared to terrestrial isopods of India. The contributions on the marine woodborers from 1963 to 1968 by various Indian authors revealed six species of the genus *Sphaeroma* and nine species of *Limnoria* from the Indian waters.

#### **v) Amphipoda**

The amphipods of the Madras coast and Gulf of Mannar. In his monographs on the Gammaridean amphipods of the Gulf of Mannar he dealt with 78 species, of 26 families. Surya Rao enumerated a detailed account of the intertidal Gammarid amphipods from the Indian coasts and listed 132 species

pertaining to 54 genera.

#### **vi) Euphausiacea**

Among the Indian coasts 23 species of euphasids from the Laccadive and Maldiva as well as from adjoining regions two species from South West Coast of India have been recorded so far.

#### **vii) Stomatopoda**

The study of Stomatopoda of India is, however, far from complete. Kemp published a monograph on Indo-Pacific stomatopods comprising of 139 species and varieties known till then.

### **Decapoda:**

#### **i) Macrura**

Although large number of species of prawns and lobsters are known to occur in and along the Indian coast, work on this group of species is very limited. World over 17 families, 67 genera and 383 species have been recorded as commercially important. A total of 55 species of commercial shrimps and prawns have been recorded in India. The east coast of India contributes to about 24.5% and the west coast contributes 75.3% of countries shrimp production.

#### **ii) Brachyura**

There are about 254 species of crabs belonging to 120 genera under 24 families recorded along the west coast of India. Among these, the names of 100 species have been revised. 22 families and 37 subfamilies represent brachyuran crabs.

#### **iii) Anomura**

Reddy & Ramakrishna listed twenty species pertaining to the families Paguridae and Coenobitidae. The study on the Anomuran crabs is far from complete and more studies are needed in this group.

### **Mollusca**

In India, till today, 5070 species of Mollusca have been recorded of which, 3370 species are from marine habitats. Andaman and Nicobar Islands have a rich molluscan diversity, which include over 1000 species from the marine region Gulf of Mannar and Lakshadweep have 428 and 424 species respectively.

### **Bryozoans**

Although regarded traditionally as a minor phylum, the group contains as many as 20,000 described species. At least 200 valid species occur in India, as in other parts of the world, only a few species of bryozoans inhabit freshwater lakes and rivers (Phylactolaemata) and most others are marine or estuarine.

### **Entoprocta**

The Entoprocta are predominantly marine having about 60 species known from the world with the exception of one genus in freshwater.

### **Echinodermata**

India has 765 species (Crinoidea: 13 families, 43 genera 95 species; Asterozoidea: 20 families, 81 genera and 180 species; Ophiuroidea: 15 families, 67 genera 150 species; Echinozoidea: 28 families, 79 genera 150 species; Holothuroidea 14 families, 62 genera 160 species) recorded until today and about 257 species are known from Andaman and Nicobar Islands.

### **Chordata :**

#### **i) Hemichordata**

So far, 102 species are recorded from the world of which 12 are known from India.

## ii) Protochordata

About 2000 species of ascidians are reported from all over the world of which 47 are reported in India (9 families, 21 genera). Out of 57 species of Thaliacea reported from the world, 48 species (four families and 19 genera) occur in India and out of 25 species of Larvacea reported from the world 18 (two families 14 genera) are reported from India.

## iii) Fishes

Fishes comprise about half the total number of vertebrates. T K Talwar has described 2546 species of fish belonging to 969 genera, 254 families and 40 orders. 57 percent of the Indian marine fish genera are common to the Indian Ocean and to the Atlantic and Mediterranean.

## iv) Reptiles

About 26 species of sea snakes belonging to the family Hydrophiidae and five species of sea turtles have been reported from seas around India. Seven species of sea turtles are found in the world's warm oceans of which five species are reported in India.

## v) Marine Mammals

A little over 120 species are estimated to occur world over and of these 40 are reported from Indian Ocean and 25 species of marine mammals. 04 species of marine mammals have listed in Schedule-I of the Wildlife Protection Act 1972. These are:

- 1) Irrawaddy Dolphin
- 2) Ganges Dolphin
- 3) Sperm Whale
- 4) Dugong



*Comanthina nobilis*



## 2- SEA TURTLES

Pratibha Singh

*Deputy Conservator of Forests, U.P. State Biodiversity Board, Lucknow*

Sea turtles are graceful saltwater reptiles, well adapted to life in the marine environment. They have flipper-leave limbs and streamlined bodies that enable them to navigate across oceans. Sea turtles must swim to the ocean surface to breathe every few minutes. When they are resting, they can remain underwater for much longer periods of time.

07 species of sea turtles are known in the world. 5 of these are reported from inside. Leatherback sea turtle (*Dermochelys coriacea*) is the sole representative of the family Dermochelyidae and is a rare species. The remaining 04 species are of a single family Cheloniidae. The flat back sea turtle is found only in Australia.

Family	Common Name	Scientific Name
Dermochelyidae	Leatherback sea turtle	<i>Dermochelys coriacea</i>
Cheloniidae	Green sea turtle	<i>Chelonia mydas</i>
	Olive Ridley	<i>Lepidochelys olivacea</i>
	Hawksbill	<i>Eretmochelys imbricata</i>
	Logger head	<i>Caretta caretta</i>

### 1. Leather back:

Leather back are so named for their tough, oil-saturated, rubbery skin which is strengthened by a mosaic of small bones under the skin. This gives the turtle a leathery appearance. They are the only sea turtle species that lack scales and a hard shell. They are mostly black on top with white and pink spots on head, neck and carapace. There are 7 ridges running down the shell of a leatherback as it tapers to a blunt point at the rear. The leatherback is the largest turtle-and the largest living reptile in the world. The diet consists of soft-bodied animals, such as jelly fish and salps.



Leather back  
(*Dermochelys coriacea*)

### 2. Green sea turtle:

Green sea turtle are the largest of all the head-shelled sea turtles, but have a comparatively small head. Adult Green sea turtles are unique among sea turtles in that they eat only plants (herbivorous), feeding primarily on sea grasses and algae. This gives them greenish-colored fat, from which they take their name. Green sea turtles actually do not look very green from outside. Their carapace can be shades of black, gray, olive green, yellow or brown with a radiant pattern, stripes or irregular spots of black and white. Their belly is creamy white or yellow.



Green sea turtle  
(*Chelonia mydas*)

### 3. Olive Ridley:

Olive Ridley sea turtles are named after the olive colored shells that many turtles of this species have. They are similar to Kemp's Ridley sea turtles. The two species are the smallest of all sea turtles. They eat crabs, shrimp, rock lobsters and jelly fish. "Arribada" is the word used to describe the mass resting of Olive Ridley sea turtles with many turtles coming ashore at the same time and many nests hatching together- it reduces predation.



Olive Ridley  
(*Lepidochelys olivacea*)

### 4. Hawksbill:

The Hawksbill turtle is small to medium-sized compared to other sea turtles. Their head is compared to other sea turtles. Their head is elongated and tapers to a point, with a beak-like mouth that gives the species its name. The shape of the mouth allows the Hawksbill to reach into holes and crevices of coral reefs to find sponges, their primary food source as adults and other invertebrates. Hawksbill turtles use different habitats at different stages of their life cycle, but are most commonly associated with healthy coral reefs.



Hawksbill  
(*Eretmochelys imbricata*)

### 5. Loggerhead:

Loggerheads were named for their relatively large heads which support powerful jaws and enable them to feed on hard-shelled prey; such as whelks and conch. The hatchlings feed on small animals and sea grasses (Sargassum), adults eat bottom dwelling invertebrates like whelks, other mollusks, horse shoe crabs, and sea urchins. The top shell (carapace) is slightly heart shaped and reddish-brown in adults and sub-adults, whereas the bottom shell (plastron) is generally a pale yellowish color. The neck and flippers are usually dull brown to reddish brown on top and pale yellow on sides and bottom.



Logger head  
(*Caretta caretta*)



Mosaic Jelly Fish

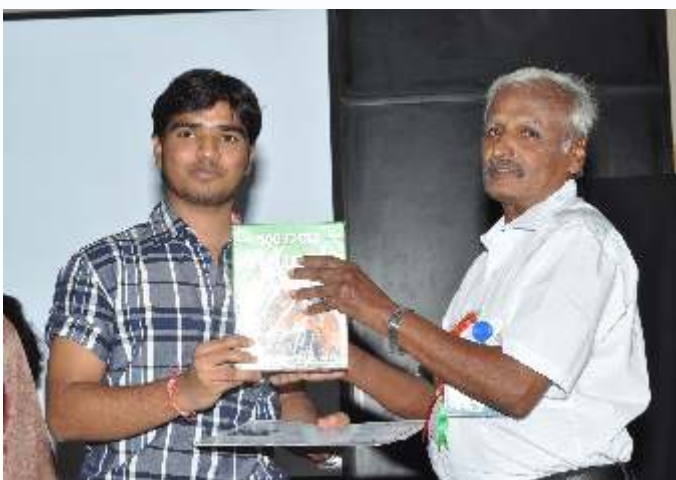
### 3. Marine Biodiversity Competitions

#### 14th May 2012

The U.P. State Biodiversity Board organized following competitions on 14th May 2012 with the help of Lucknow University, Zoology Department at Regional Science City, Aliganj Lucknow.

S.N.	Name of the competition	Topic
1.	Power point presentation	Illegal Trade in Marine Biodiversity
2.	Poster competition	Uses of Marine Biodiversity
3.	Quiz competition	Marine Biodiversity
4.	Essay competition	Ocean and their Importance in our Daily Life

The winners of the quiz competition were: Dhruv Dixit, Abhinav Pradeep and Nilesh Gupta. The winners of power point competition on "Illegal Trade in Marine Biodiversity" were: Vishnu Gupta, Kastubh Tandon, Pragati Yadav and Levin Roy. The prize winners of poster competition on "Uses of Marine Biodiversity" were: Avani Vikram Singh, Vishal Verma, Umama Fatima and Vishakha Chaudhary and that of the essay competition were: Snehil Srivastava and Charu Singh.



Chief Guest Prof. Syed Ajmal Khan giving away prizes on 22 May 2012, IBD



## Winners of Poster Competition



Avani Vikram Singh 1<sup>st</sup> Prize



Vishal Verma 2<sup>nd</sup> Prize



Umama Fatima 3<sup>rd</sup> Prize



Vishakha Chaudhary Consolation Prize

# 4-International Day for Biological Diversity-2012

22nd May, 2012



Uttar Pradesh State Biodiversity Board celebrated the International Day on Biological Diversity (IDB-2012) on 22nd May 2012 at Dr. Ram Manohar Lohia National Law University Campus, Lucknow. On this occasion, a National Conference on “**Marine Biodiversity**” was organized in which more than 350 delegates including various research organization/ institute, universities, officers from U.P. Forest Department and other state as well as NGO's etc participated. The aim of the conference was to create awareness about oceans and to inspire action to conserve marine wilderness and biodiversity. The conference was inaugurated by **Dr. Syed Azmal Khan**, Professor Emeritus, Centre of Advanced Study in Marine Biology, Annamalai University, Parangipettai, Tamil Nadu.



22 May 2012  
INTERNATIONAL DAY  
FOR BIOLOGICAL DIVERSITY  
Marine Biodiversity

Shri J.S. Asthana, Principal Chief Conservator of Forests, U.P. welcomed all the dignitaries and delegates of the conference and delivered the welcome address. He said that presently, so far 2,30,000 species available in the marine ecosystem have been identified but still information on thousands of species is yet to be explored. He expressed the concern about increasing pollution load on seas and the need of the hour to spread the awareness in this regard..



Rajesh Kumar Singh

Shri Rajesh Kumar Singh, Secretary (Environment and Forests) and Chairman, U.P.State Biodiversity Board, in his talk stated that this year, the International Day for Biological Diversity is being celebrated on the theme of "Marine Biodiversity". About 65% of grasses and habitats in coastal



J.S. Asthana



areas have almost been destroyed. Approx. 80% of sea fish stock has either been exploited or over exploited. He further added that the aspect of biodiversity conservation should be introduced as a subject in study course of students of class VI to XII.

**Dr. J.K. Jena**, Director, National Bureau of Fish Genetic Resources, Lucknow delivered his guest lecture on marine fish biodiversity and its management. Giving the brief account of marine resources, he said that coast line of India extends upto 8129 km with EEZ as 2.02 million km<sup>2</sup> the fishery potential of our country is 3.9-4.2 million tones. He said that the Arabian Sea is known as one of the world's most productive oceanic region- upwelling, broad continental shelf area and wind-driven mixing. He informed that as far as aquatic diversity of India is concerned, there are 2508 fishes (7.4% of world species), 2934 crustaceans (7.4% of world species), 5070 mollusks (6.0% of world species), 765 echinoderms (10.9% of world species), 486 sponges, 842 cnidarians (8.4% of world species), 844 seaweeds (4.2% of world species). According to him, the major threats to the biological resources in aquatic ecosystems include: extensive use of non-selective gears, indiscriminate capture of juveniles and sub-adults, onboard discards of low value fishes, coastal pollution, and habitat alteration. Besides, climate change and natural calamities are posing serious threats to the marine biodiversity.



*Dr. J.K. Jena*



*Pawan Kumar*

Speaking on this occasion, Shri Pawan Kumar, Secretary, U.P. State Biodiversity Board, Lucknow focused on the importance of the year 2012 for India as India is hosting COP-11 (Conference of Parties) of CBD in Hyderabad during this year. This year is also the 20th Anniversary of the Rio Conference on Environment and Development, 20th Anniversary of Convention on Biological Diversity (CBD) and the 40th Anniversary of the 1992 first UN Conference on the Human Environment held in Stockholm in 1972. Throwing the light on the connection between Aichi targets and marine biodiversity, he gave the detailed overview of Target 6, Target 10 and Target 11 of the Aichi targets. As far as the marine biodiversity is concerned, he emphasized on the diversity of genes, species and ecosystem diversity followed by an introduction about phytoplankton and zooplankton. His presentation was also focused on the uses of marine biodiversity as food and medicines of tomorrow. During his talk, he drew the attraction of the audience towards the role of the ocean, which acts as carbon sink in balancing the carbon di-oxide emissions generated by us and also providing us minerals and many more advantages which are not been taken into account. While concluding his presentation, he expressed his concern to save marine biodiversity and discussed some important critical ocean issues to be taken care of viz. overfishing, pollution, ocean acidification, global warming, habitat loss, deep water drilling.

As a chief guest, **Dr. Syed Azmal Khan**, Professor Emeritus in his talk gave an account of potential values of biodiversity as food fodder, species and aromatics, fibres in textiles, fuel supply etc. He said that more animal phyla exist in oceans than on land. He informed the audience that of 35 marine phyla, 14 are endemic whereas rare phyla contain only few species. Focusing his talk on significance of sea food, he



*Dr. Syed Azmal Khan*



said that seafood is superior to all the other animal protein sources. He also described important marine habitat e.g. corals, mangroves, sea grass beds, seaweed stretches, rocks and sand dunes. Dr. Khan also showed the beautiful slides of marine biodiversity such as coral, coral reefs, butterfly fishes, angel fishes, cardinal fishes and groupers etc. He further added that seventy percent of the modern medicines come from biodiversity. The sea is a source of many bacteria that are useful as antibiotics. Besides, the marine biodiversity provides 90% of oxygen in our atmosphere due to phytoplankton which spin food web in the sea and 30% carbon fixation in sea is due to them. Further, he highlighted the various benefits of seafood as a good source of vitamin complexes, prevention from Osteoporosis, bone diseases and cure of diabetes etc.

In the first technical session of the conference, Shri Samir Sinha, from Dehradun, gave a brief account of illegal life trade in marine biodiversity. He discussed the potential values of wild life trade and informed that the most wildlife trade is probably within national borders, but there is a large volume of wildlife in trade internationally.



*Dr. K.C. Gopi*

**Dr. K.C. Gopi**, Senior Scientist, Zoological Survey of India, Indian Museum Complex, Kolkata delivered his guest lecture on "Coastal and Marine Biodiversity of India." He presented the status of marine environment of India incorporating 10 maritime states with 800 km stretch of coastal region having 2 island groups and 3 gulf areas. He reported that 2.66% (4,827 sq. km) of world's mangroves exist in India. Describing the various coastal and marine ecosystems, Dr. Gopi informed that mangrove ecosystem possesses 420 and 1862 species of flora and fauna respectively. Talking about the associated biodiversity in seagrass ecosystem, he said that there are 153 microalgae, 359 macroalgae, 178 invertebrates live as epiphytes and as associated organisms, fishes.

About 340 animals feed on seagrasses, green turtles partially feed on seagrasses. Besides, 844 species of seaweeds he also exist in marine ecosystem of India. Further, he added that estimated total biodiversity of the world is 3-10 million in which only 1.7 million species have been identified where as total marine species in the world are estimated to be 3 lakhs out of which about 80,000 (3.12%) species have been identified so far. India contributes 5.33% (15,000 spp.) of the world's estimated marine species.

**Dr Alok Saxena**, Addl. Director, Indira Gandhi National Forestry Academy, Dehradun spoke on Marine Diversity in India conservation and Management issues (with special reference to A & N islands). He stated that sea waters cover about 70% of Earth's surface and account for 99% of volume known to sustain life. The total number of recorded marine species (both plants and animals) is less than that of terrestrial habitats mainly because marine diversity has not been fully understood due to logistic constraints in explorations and collection of specimen. Nearly all phyla are found to occur in the sea while only about half of the total number of phyla is represented by land animals. 21 phyla are exclusive marine. Similarly, marine plant life forms also show greater survival strategy.



*Dr Alok Saxena*

Focusing on India's rich marine biodiversity he said that coastal waters along East and West Coast and also around two island groups have a plethora of marine species. Marine floral diversity includes 844 species of marine alga (sea weeds) belonging to 217 genera, 14 species of sea grasses and 69 species of mangroves. Marine faunal diversity includes 451 species of sponges, >400 species of corals,

>2900 species of crustacean, 3370 species of marine mollusks, > 200 species of bryozoans, 765 species of echinoderm, 47 species of tunicates, more than 1300 marine fishes, 26 species of sea snakes, 5 species of sea turtles and 30 species of marine mammals including dugong, dolphins, whales etc. In addition a wide variety of sea birds can be observed around the coast.



*Dr. Dhruv Sen Singh*

**Dr. Dhruv Sen Singh**, Department of Geology, University of Lucknow delivered his talk on "Climate Change, Global Warming and Marine Biodiversity." The planet earth is also diversified and consists of various continents and oceans. Our nation India is the classical example of diversification in terms of geography, language, caste, religion etc. India hosts 2 biodiversity hotspots; the Western Ghats and the Himalayas. These hotspots have numerous endemic species. Expressing the views on marine biodiversity,

**Dr. S. Balachandran**, Deputy Director, Bombay Natural History Society, Mumbai delivered his guest lecture on "Avian diversity in coastal wetlands of India and their conservation needs". He described the role of coastal birds in the ecosystem as: recycling the nutrients back to the ecosystem, enriching the nutrients through guano deposition and enhance the fisheries, scavenging by feeding on the fishery wastes and feeding harmful insects-vector control. He told that there are 25 wetlands in India identified as Ramsar Sites out of which one belongs to Uttar Pradesh. So far in U.P., there are 20 potential Ramsar sites with diversified flora and fauna. Talking about the water birds in coastal ecosystem, he informed about the number of shore birds (58), ducks (20), terns (21), gulls (10) and flamingos (2) in coastal habitats. He also gave a brief account of important migratory species and their numbers in the wetlands of Tamil Nadu. Presenting the scenario of threatened birds, he told that out of critically endangered species of world (181), India possesses 9, endangered species of world (351), India has 12 and out of 674 world's vulnerable species, there are 59 species in India itself.



*Dr. S. Balachandran*

In the inaugural session, a souvenir on the theme of the conference was also released. It carried twenty two articles on marine biodiversity.



*Clown Fish*





Release of Souvenir on International Day for Biological Diversity 2012



Inauguration of IBD-2012



Chairman, UPSBB addressing the audience



Exhibits of Marine Biodiversity



UTTAR PRADESH STATE BIODIVERSITY BOARD



The Souvenir released on 22 May 2012. A softcopy of the same is available at [www.upsbdb.org](http://www.upsbdb.org)



Secretary, UPSBB presenting a memento to the Chief Guest



A general view of the audience



## 5- World Environment Day (WED)

05th June 2012



The World Environment Day (WED) has been celebrated on 05th June across the globe with a theme *“Green Economy: Does it include you?”* On this occasion, competition on Power Point Presentation on the Topic *“Ten Ideas to Make Lucknow Cleaner and Greener”* was organized by the U. P. State Biodiversity Board at PICUP Bhawan, Gomti Nagar Lucknow during 11:00 am -13:30 pm. The competition was divided into two categories i.e. junior group and senior group. The support to us in our efforts to spread awareness about protection of environment *vis-a-vis* green economy was encouraging.



*Clown Fish and Sea Anemones*

# 6- Newspaper Clippings

## (i) International News

THE HINDU • SUNDAY, APRIL 8, 2012

**CONSERVATION**

### Fish in troubled waters

Urgent attention is required to save the Hilsa fish that is struggling to survive the rivers between Bangladesh and West Bengal

Rinsha Shajan, Perappadan

A quintessential Bengali delicacy and the national fish of Bangladesh 'Hilsa' is passing through its toughest phase in a fight for survival, warn environmentalists and scientists.

"The fish is exploited by intensive fishery, indiscriminate exploitation of juveniles (jatka) and a disruption of migration routes. The loss of spawning, feeding and nursing grounds and increased river pollution are some of the causes known to have contributed to the steep decline of the fish," said Dr. M. Mamil Naser, Department of Zoology, University of Dhaka.

In a research paper presented at 'Ecosystem for life' – a conference organised by the International Union for Conservation of Nature in Bangladesh recently – Dr. Naser who co-authored the study with Professor Dewan Ali Akbar said, "The over catching of jatka, lack of water supply, increasing number of fishermen and increasing siltation are among the major reasons for the fast decline in the hilsa numbers."

Hilsa has a wide range of distribution and is found in marine, estuarine and riverine environments. The fish is found in the Persian Gulf, Red Sea, Arabian Sea, Bay of Bengal, Vietnam Sea, and China Sea. The riverine habitat covers the Sattl Arab, the Tigris and Euphrates of Iran and Iraq, the Indus of Pakistan, the rivers of Eastern and Western India, the Irrawaddy of Myanmar, and the Padma, Jamuna, Meghna, Karnaphuli and other coastal rivers of Bangladesh.

"Hilsa fishery makes up for a large share of Bangladesh's total fish production and in terms of exports, the fish plays a significant role in the economy of Bangladesh. It is estimated that about two million fishermen and traders are engaged in hilsa fishing in the country," said Dr. Naser.

Experts claim that scientific interest in the fish and its exploitation became evident in the late 1940s when attempts were made to define the major biological parameters of the species. Little attention, however, was paid to the fisheries.

"We know that till about 1972 hilsa fishery was restricted to the upstream rivers, mainly Padma, Meghna, Karatoya, Rupsa, Shitua and Payra. However, now fishery has severely declined in the upstream areas and is mainly concentrated in the downstream rivers, estuaries, coastal areas and the sea. Also, the construction of the Farakka barrage in India has hit the fish hard. The fish is caught in the coastal and estuarine waters before they can migrate upstream for spawning. Local fishermen catch migrating adults from May to October, and the juveniles from February to May. Though Bangladesh has imposed a ban on fishing of this fish from March to April, it is hard to maintain this when they see fishermen in India catching these fishes just a few metres away," said Dr. Naser.

"In our study, 'Migratory spawning pattern and anthropogenic interferences on hilsa fishery: Bangladesh-India initiative', we found that the conflicts in hilsa fishing included the fact that the number of fishermen has registered a sharp increase (in some places three times) in the past one decade. Many part-time fishers are harvesting hilsa in peak season, landless people (due to river erosion) become fishermen as they have limited alternate job opportunities and exploitation of the fishing community by money lenders, where fishers often have to lend money to buy nets, boats and others and then pay most of their catch to money lenders is pushing them to over catch the fish," adds Professor Akbar.

Stating that during the 1980s hilsa production was fairly stable, he notes that this trend has changed in the recent years. "Our research has shown that the production of the hilsa has indicated a sharp decline and what is worrying is the fact that there seems to be no halt to this descent," adds Professor Akbar.

The study concludes by recommending that there should be a hilsa management plan common to both the countries. "We need a wider trans-boundary population and genetic study to be conducted to see whether the two hilsa populations are same and possess any difference in their biology, especially their abundance, maturity and spawning habit. This information can be used to ensure that this popular fish is saved of its premature death," added Dr. Naser. Stressing the need for maintenance of ecological flow to ensure spawning and migration of hilsa, the study further states that there is an urgent requirement to identify new spawning grounds for the fish and bring in investigation on stakeholders' perceptions for the formulation of better conservation strategies.

**ON THE DECLINE:** Overcatching is a major reason for the dwindling numbers. PHOTO: PARTH SANYAL




**PRICES ON THE RISE:** Hilsa plays a significant role in the Bangladesh economy. PHOTO: ARUNANGSU ROY CHOWDHURY

08 April 2012 :

The population of Hilsa fish is getting severely affected due to over fishing. Bangladesh has imposed a ban on fishing this fish from March to April.

Other reasons for decline in population include –

1. Indiscriminate exploitation of juveniles (jatka)
2. Disruption of migration routes
3. Lack of water supply
4. Increasing number of fishermen
5. Increasing siltation
6. Loss of spawning, feeding and nursery grounds, Increased river pollution



# Newspaper Clippings

## (ii) National News

DELHI  
THE HINDU • SUNDAY, APRIL 1, 2012

### Anti-malarial compounds from marine organisms

T. Nandakumar

**THIRUVANANTHAPURAM:** Indian scientists have achieved a breakthrough in the search for new anti-malarial compounds of natural origin to combat different strains of the parasites responsible for the dreaded disease.

An interdisciplinary research team comprising scientists drawn from four institutes across the country has zeroed in on two marine organisms that generate chemical compounds with potent anti-malarial activity.

Extracts of more than 200 organisms including different species of marine fungi, seaweeds, mangroves, sponges, cnidarians, molluscs, echinoderms and ascidians were screened during the first two phases of the project which began in 2004. About 25 organisms showed the presence of anti-malarials.

The two most promising candidates are reported to be effective against drug sensitive and resistant strains of the malarial parasites. One of the organisms was found to possess as many as 10 anti-malarial compounds. Some of the promising leads are very effective even at very low concentrations. Efforts are on to patent the findings.

#### Collaboration

Named 'Discovering Anti-malarials from Marine Organisms', the collaborative project involves the Centre for Marine Biodiversity under the University of Kerala, the In-



**CURE FROM THE SEA:** An underwater photograph showing one of the marine organisms with antimalarial potential collected by scientists from the Gulf of Mannar. — PHOTO: SPECIAL ARRANGEMENT

ternational Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi; Indian Institute of Chemical Technology (IICT), Hyderabad; and the Institute of Himalayan Bioresource Technology (IHBT), Palampur. The Department of Biotechnology, Government of India, is funding the project.

The marine organisms are collected from the seabed, their extracts prepared and subjected to metabolite fingerprinting at the Centre for Marine Biodiversity to detect their biological and chemical features. The extracts are then sent to the ICGEB where they are screened for anti-malarial activity using state-of-the-art high-throughput (HTP) assays

for faster identification of active compounds.

While the structural elucidation (determination of the chemical structure) work is done at the IICT, the compounds will be synthesised at the IHBT, to produce biologically active metabolites in the quantities required for further studies and clinical trials.

The University of Kerala has signed a Memorandum of Understanding with the ICGEB for collaboration and sharing of intellectual property rights.

The organisms are selected through an elaborate process of underwater observation for marine chemical ecological interactions, followed by field and laboratory experimentation. The samples have been

collected mostly from the Gulf of Mannar and Palk Bay where coral reefs abound.

"Drug resistance has emerged as one of the greatest challenges facing malaria control today. Malarial parasites have developed strategies to evade most of the available treatments. This has triggered a global effort to identify novel, better and affordable anti-malarial compounds," explains K. Padmakumar, Director, Centre for Marine Biodiversity, and one of the principal investigators of the project, who has carried out more than 200 scuba dives to collect samples from the seabed.

The potential anti-malarial compounds are often generated by sedentary marine organisms as a defensive mechanism to deter potential predators or pathogens, reduce the impact of environmental stress, prevent overgrowth or for protection from ultraviolet radiation. "What we are essentially doing is to harness the defensive mechanism of the marine organisms to develop biologically active metabolites that can be used to fight the malarial parasite," Dr. Padmakumar says.

#### Third phase

During the third phase of the project, scientists will collect more samples of the two most promising organisms to identify the chemical components that impart the anti-malarial property. This will be followed by laboratory synthesis to obviate the need to harvest from Nature.

**01 April 2012:** Scientists from the Centre of Marine Biodiversity, University of Kerala and the ICGEB (International Centre for Genetic Engineering and Biotechnology) have examined extracts of over 200 different marine organisms searching for presence of anti-malarials. Two organisms have been found to be most promising—one possessing as many as 10 anti-malarials.



# Newspaper Clippings

DELHI

THE HINDU • SATURDAY, APRIL 21, 2012

## New species of caecilian amphibian reported from Kerala

T. Nandakumar

**THIRUVANANTHAPURAM:** A team of scientists from the University of Kerala; Central University, Kasaragod; and Natural History Museum, London, have reported the discovery of a new species of caecilian (limbless) amphibian from the southern region of the Western Ghats in Kerala.

*Gegeneophis primus* belongs to the Indotyphlidae family comprising African, Seychellean and Indian varieties. It is the first new species of *Gegeneophis* reported from Kerala since 1964. The species were collected from the Sugandhagiri Cardamom Estate neighbouring an evergreen forest at Vythiri in the northern district of Wayanad.

The team, including K. Ramachandran from the University of Kerala, Oommen V. Oommen from the Central University and David J. Gower and Mark Wilkinson from the Natural History Museum found that the species, unlike other *Gegeneophis*, lacked scales and secondary annular grooves, as well as a well-



*Gegeneophis primus*, the new species of caecilian amphibian reported from Kerala.

veloped terminal shield.

Measuring approximately 168 mm in length and pink in colour, the specimens were dug out from moist soil along the shrub-covered banks of a stream under a dense canopy.

### Chance find

The researchers stumbled upon the new species while on the trail of another caecilian spotted in Kerala 142 years ago. After a second collection from the same location, the identification was confirmed by scientists at the Natural History Museum.

The finding has been reported in the latest edition of *Zootaxa*, an international journal for zoological taxono-

mists. The wider distribution, natural history and habitat preferences of the species are yet to be determined.

The paper notes that the population of *G. primus* at the locality from where it was found was not likely to be under threat as long as the habitat was maintained. The team has proposed that the conservation status of the species be classified as Data Deficient under the IUCN Red List criteria. The paper suggests the common name of Malabar Cardamom Geg for the species, indicating the northern part of the State and the cardamom estate from where it was discovered.

*G. primus* is only the third Indotyphlid caecilian species reported from Kerala after *G. carnosus*, described by Beddome in 1870 and *G. ramaswami* by Taylor in 1964.

Dr. Oommen said the discovery was significant since the finding ended a hiatus of almost half-a-century. "It highlights the fact that the knowledge of caecilian amphibians of the Western Ghats remains incomplete and in need of further study."

**21 April 2012:** A new species *Gegeneophis primus* has been reported from Wayanad district of Kerala. It measures about 168 mm in length and is pink in color. It is the third *Indotyplid caecilian* species reported from Kerala. The others were *G. carnosus* (1870) and *G. ramaswami* (1964).



# Newspaper Clippings

## (iii) State News



### Lucknow's muskmelons disappearing

SHARMILA KRISHNA ■ LUCKNOW

Summer time reminds of juicy musk melons, popularly known as kharbogra. Old timers may still recall the musk melons that used to be available in Lucknow markets — sweetest varieties, smooth-skinned and reddish from inside, unlike the crunchy rough-skinned ones available in the market today.

A recent study carried out by UP Biodiversity Board shows that indigenous variety, which is specific only to Lucknow, is disappearing. Deputy conservator, Forest, Pratibha Singh from UP Biodiversity Board says the study shows that this variety, grown mostly in Bakshi-Ka-Talab area, is in a state of neglect.

The study was started in 2011 in collaboration with Narayan Dey Agricultural and Technological University, Faizabad, with the principal investigator being Dr Sheo Pujan Singh from the university. The investigation was carried out on the cucurbitaceae family (popularly known as the cucumber family) to explore the varieties found in Uttar Pradesh and encourage conservation of the species.

The study shows that the state has 14 varieties from the family — sponge gourd, cucumber, bitter gourd, long melon, ivy gourd, satputia, ash gourd, zucchini, water melon, bottle gourd, pumpkin, snap melon and pointed gourd.

"We found that batti, which is a musk melon found only in Lucknow, is slowly disappearing and being replaced by Jaunpuri and Faizabadi melons apart from the hybrid varieties," said Singh.

He added that one could not give a conclusive reason as to why Lucknow-specific musk melons were getting lesser and lesser.

"It could be because of factors like cross pollination, changes in the soil quality or market forces where people are ready to opt for bigger-sized fruits which are less sweet," said Singh.

He said it was important to carry out these studies and encourage people to grow the varieties which were on the decline in terms of production.

"What is a matter of concern is not whether these varieties are getting lost but the rate at which we are losing them. Whatever has grown in the local region adapting to the local conditions is of genetic value. Saving these species is a kind of genetic conservation," said Singh.

27 April 2012 : "Batti" a musk melon found only in Lucknow is fast disappearing and is being replaced by Jaunpuri and Faizabadi melons.

HINDUSTAN TIMES, LUCKNOW  
TUESDAY, MAY 22, 2012

RML UNIVERSITY

### Marine life to be focus of national conference

HT Correspondent

lkoreportersdesk@hindustantimes.com

LUCKNOW: Marine life will be the focus of the national conference being held to mark the International Day for Biological Diversity at Dr Ram Manohar Lohia National Law University on Tuesday. The UP State Biodiversity Board (UPSBD) is organizing the conference. The theme set by Convention on Biological Diversity (CBD) is 'Marine Biodiversity-One Ocean Many Worlds of Life'.

"International Biodiversity Day-2012 is of special significance as it is the 40th anniversary of the first UN Conference on Human Environment held in Stockholm, 20th anniversary of the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, and the 10th anniversary of the World Summit on Sustainable Development in Johannesburg," says UPSBD senior official Pratibha Singh.

The decade 2011-2020 has also been termed as the International Decade of Biodiversity. Among other events focussing on this burning environmental issue,

THE CONFERENCE AIMS TO CREATE AWARENESS ABOUT OCEANS AND INSPIRE MEASURES FOR CONSERVATION OF MARINE ECOSYSTEMS

India will be hosting the Conference of the Parties to the Convention on Biological Diversity (COP 11) at Hyderabad in October this year, Singh says. Target actions on the CBD theme include addressing sustainability of fish harvests, invertebrates and marine plants in marine and coastal areas; and, the establishment of protected areas for marine ecosystems.

To spread awareness among school children, various competitions were organised on May 14, the prizes for which will be given during the programme on Tuesday.

The national conference aims to create awareness about oceans and their role as sources of oxygen, protein, medicine and climate regulation. It also hopes to inspire measures for conservation of marine ecosystems.

22 May 2012: The International Day for Biological Diversity is to be celebrated on 22nd May, 2012. The theme this year is "Marine Biodiversity".



# Newspaper Clippings

**the pioneer**  
LUCKNOW TUESDAY 1 MAY 2012

## International Biodiversity Day today

PRINCE NEWS SERVICE • LUCKNOW

The UP State Biodiversity Board will celebrate the International Day for Biological Diversity 2012 from Tuesday. A national conference has been organised on the occasion at the Dr Ram Manohar Lohia National Law University on the basis and by the Centre for Advanced Studies in Marine Biology (CASMAB).



The aim of the conference is to create awareness about oceans and to inspire action to conserve marine wilderness. For the millions of people, even those who stay far away from oceans - the oceans provide many benefits and services - some of them being oxygen, the air we breathe, source of protein, medicines, regulation of climate change and carbon sink.

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The 10th anniversary of the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg (South Africa) is also the International Decade of Biodiversity (2011-2020). India will be hosting the COP (1) of the Convention on Biological Diversity (CBD) in 2012.

Also, in the 10th COP held at Nagoya, Japan, in 2010, the general assembly adopted a strategic plan for biodiversity for the period 2011-2020. The plan and the 10 Action Targets (ATs) include marine ecosystems and related targets for marine and coastal areas, including issues of sustainable use of fish, aquaculture and marine genetic resources and the establishment of marine protected areas which are important for the global conservation strategy for biodiversity.

Major role continues to be played by marine biodiversity. Efforts are being made to the best of the knowledge of marine and coastal biodiversity on the basis of the knowledge of marine biodiversity and the knowledge of marine biodiversity.

**the pioneer**  
LUCKNOW WEDNESDAY 1 MAY 2012

## 'Good brand ambassador needed for biodiversity'

PRINCE NEWS SERVICE • LUCKNOW

The UP State Biodiversity Board celebrated International Day for Biological Diversity by organising a national conference at Ram Manohar Lohia National Law University on Tuesday. Chief guest on the occasion was Dr Syed Ajmal Khan, Prof Emeritus from Centre for Advanced Studies in Marine Biology, Annamalai University.



Dr. Syed Ajmal Khan, Prof Emeritus from Centre for Advanced Studies in Marine Biology, Annamalai University, speaking at the conference.

Rajesh Kumar Singh, chairman of the Board, emphasised on the importance of conserving biodiversity. He said that marine biodiversity was important even for those who stayed away from oceans. "We are all dependent on oceans in one way or the other."

Act had an important role to play in the lives of common people. He urged practitioners in the field to document their knowledge of biodiversity.

Rajesh Kumar, secretary, Forests, said that 2012 was important for India, as India was host to COP-12.

Conference of parties of the CBD (Convention on Biological Diversity) this year that is being hosted in Hyderabad. He said that 2012 was also the 20th anniversary of Rio Conference on Environment and Development.

संस्करण: 22 मई 2012 दैनिक जागरण लखनऊ जागरण

## पाठ्यक्रम में शामिल हो जैव विविधता संरक्षण

• जागरण जैव विविधता दिवस पर



जैव विविधता दिवस पर कार्यक्रम का शुभारंभ करते हुए अतिथि डॉ. सी.एस. अश्वथाम

लखनऊ, 22 मई (जागरण) जैव विविधता दिवस पर कार्यक्रम का शुभारंभ करते हुए अतिथि डॉ. सी.एस. अश्वथाम

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संस्करण: 22 मई 2012 दैनिक जागरण 5

ले संकल्प : अंतरराष्ट्रीय जैव विविधता दिवस उद्घाटन

## कोशिश करें, प्रकृति के ये तोहफे बचे रहें

लखनऊ, 22 मई (जागरण) जैव विविधता दिवस पर कार्यक्रम का शुभारंभ करते हुए अतिथि डॉ. सी.एस. अश्वथाम

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HINDUSTAN TIMES, LUCKNOW  
WEDNESDAY, MAY 23, 2012

## shortstories



Kids participating in a flower arrangement competition at Regional Science City on Tuesday. DEEPAK GUPTA/HT PHOTO

## 70% OF MEDICINES COMES FROM BIODIVERSITY, SAYS PROFESSOR

LUCKNOW: The UP State Biodiversity Board celebrated the International Day for Biological Diversity by organising a national conference at Ram Manohar Lohia National Law University. Dr Syed Ajmal Khan, Prof Emeritus from the Centre for Advanced Biology, Annamalai University was the chief guest. Speaking on the occasion, Khan said all humans and animals get their food only from biodiversity. "Seventy percent of the medicines come from biodiversity. The sea is a source of many bacteria that are useful as antibiotics," he said. The principal chief conservator of forests, JS Asthana, was also present on the occasion. Prizes were given away to students who participated in the celebrations of marine biodiversity. Rajesh Kumar Singh, chairman of the board, emphasised the importance of conserving biodiversity. Renu Singh, director, Lucknow Zoo, compered the programme. Also present on the occasion were Pratibha Singh, DCF UP State Biodiversity Board.

**22 May 2012 : The IBD- 2012 is being celebrated at Dr. Ram Manohar Lohia National Law University. The key note speaker on the occasion is Prof. Syed Ajmal Khan from the Centre for Advanced Studies in Marine Biology.**



# Newspaper Clippings

THE TIMES OF INDIA, LUCKNOW  
WEDNESDAY, MAY 23, 2012

## Killer coastal fish to combat JE

Shraddha Sharda | TNN

**Lucknow** A small fry from the musked belt of India could prove a potent weapon in the battle against the menace of Japanese encephalitis in eastern Uttar Pradesh. This small killer fish, *Gambusia*, is known for devouring mosquito larvae—100 to 300 per day. So, the U.P. government has added it to its armory for controlling mosquitoes, which are primarily responsible for the spread of the dreaded disease that has claimed more than 5,000 lives in the past seven years.

"Bringing *Cambusia* against mosquitoes is like launching a biological attack on disease-causing vector. Mosquito control is important to check both Japanese and acute encephalitis," said Mukesh Meshram, NRHM mission director in the state. "*Cambusia* is a sub-

## WONDER FISH



- *Gambusia affinis* is natural enemy of mosquitoes

► A single fish eats nearly 300 mosquito larvae a day

- It breeds fast, can survive in any kind of tropical climate

➤ The fish will be used in 20 worst-hit districts to combat encephalitis

face feeder, hence it is suitable for feeding on both malaria-causing mosquitoes (anophelines) and common house mosquito (culexines)," he added.

The cost of running the project in 20 encephalitis-hit districts of eastern UP is a meagre Rs 38 lakh per annum. As per the project model by the state dis-

► UP not the only state, P 4

series department, the government would buy these fish from Bengal, Gujarat and Maharashtra at a rate of Rs 4 per unit to be fertilized at 100 primary and community health centres in these districts. The full-grown fish would be released in drains, ponds and other places where water naturally gets accumulated and allows mosquitoes to breed freely.

UP is not the only state banking on mosquito fish

▶Continued from P 1

It is not the only state banking on this little fish for mosquito control. In fact, it is also known as the mosquito fish. In a set of guidelines issued by the National Vector-Borne Diseases Control Programme, the ministry of health has advocated the use of *Gambusia* for control of mosquito population. Not only this, vector control agencies across the world also rely on the cod for getting rid of the mosquito menace. "*Gambusia affinis* are indispensable to modern mosquito control programmes," reads an American health advisory.

An Indian Council of Medical Research study revealed that Cambodia has a predation rate of 35.7% in natural habitats. In fact, a study conducted in Shahjahanpur revealed that it helped control mosquito larvae by 87.8%. There is evidence to prove that the fish works equally well in settings like marshy areas, wells, pits and rice fields.

Gambusia was brought to India in the late 1920s and is easily available in Bengal, Maharashtra and Gujarat. According to experts, it is easy to transport and hatch this fish for various purposes. "It survives in new places (water bodies) and multiplies easily. After release when it becomes well established in a water body, the fish can survive in good numbers for years and does not require constant care," said a health ministry document.

**23 May 2012:** A small fish called *Gambusia* is known for devouring mosquito larvae about 100 to 300 per day. *Gambusia* is a surface feeder hence suitable for feeding on mosquito larvae. The fish are being brought from Bengal, Gujarat and Maharashtra and released into drains, ponds and other places.

## हिन्दुस्तान

Page 45 of 45 • 30 June 2017 08

वृक्ष भी देते हैं भाई-चारे की  
भावना को ऑक्सीजन..

ਰਾਮਗੜ੍ਹ, ਗੋਰਾ ਅਲੜੀ

[illegible]

दोहों को लागें जो कि ईश्वर देने वाला है  
 देने की सर्वोच्च योजना बनाने है। यह  
 सिद्ध होना चाहिए कि कार्यक्रम है।  
 धर्म : आस्था से जुड़े से ईश्वर को  
 सौंपने की प्रवृत्ति को ईश्वर की।  
 परवर्तन को बचाव का सफाया है।  
 यदि लोग मरें, दूसरे के धर्मिक  
 सिद्धांतों को भी पढ़ना है। तो  
 इससे धर्मिक सद्भाव बढ़ेगा  
 और ध्यानात्मक प्रवृत्ति से भी  
 सद्भाव तो रहेगा।

धर्मधर्म पूरे अर्थपूर्ण होना  
 चाहिए। ईश्वर की सेवा, ईश्वर का

[illegible]

**30 June 2012:** A series of booklets have been published by the U.P. State Biodiversity Board on trees important in various religions like Hinduism, Buddhism, Islam etc. These are available on the website of the Board at

[www.upsbdb.org/brochures.php](http://www.upsbdb.org/brochures.php)



## Save Marine Biodiversity

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