ISSUE 5 I YEAR 2023

ZOONIVERSE

Department of Zoology

S. S. Jaiswal College, Arjuni / Mor.

2023

Published by : Department of Zoology, Shivprasad Sadanand Jaiswal College, Arjuni/ Mor.

Issue : 05

Year : 2023

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Dr. Manoj K. Bangadkar (Co-editor)

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Front cover : Tasar Silkmoth, *Antheraea mylitta* D. with life stages Eggs, Larva and Pupa in Cocoon
(Photo courtesy : Dr. Manoj K. Bangadkar

Back cover : Biodiversity conservation banner

ZOONIVERSE

Department of Zoology,

S. S. Jaiswal College, Arjuni / Mor.

2023

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VISION

"Envisions to inculcate the greatest values of life, science education, respect for nature and concern for ethical values among students through good and scientific educational practices"

MISSION

- *To impart to the students the contemporary advancement in life sciences*
- *To impart a global perspective and such skills among students that benefit humanity.*

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Editorial

Dr. Gopal T. Paliwal
(Editor)

Dr. Manoj K. Bangadkar
(Co-editor)

Dear Readers,

Greetings to you….

Very few have fully realised the wealth of sympathy, kindness and generosity hidden in the soul of child. The effort of every academician should be to unlock that treasure. Shivprasad Sadanand Jaiswal College is an excellent example where everyone strives indefatigably for this. This institution has been nurturing young minds of this area for the past 30 years with the belief that "The heart of education is the education of the heart."

So here you have "ZOONIVERSE" the long awaited magazine for the session 2022-23. This magazine gives an insight into real way of life, their creativity and activities. It is a platform for the young minds that exhibits the skills and innovative ideas of the students and teachers. ZOONIVERSE presents the hard work and dedication of the students and contribution of teachers.

We would like to thank all our editorial team members for their help to pull this through. We express our considerable appreciation to all the authors of the articles in this magazine. Their contributions have required a generous amount of time and efforts. It is the willingness to share the knowledge concerns and special insights with fellow things that has made this magazine possible.

Principal's Message

Shri Durga Shikshan Sanstha's
SHIVPRASAD SADANAND JAISWAL COLLEGE
Arjuni/Morgaon, Dist. Gondia, Maharashtra - 441701
(Grant-in-aid Institution with UG Program in Arts, Commerce & Science
Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur)
Re-accredited with B Grade in 3rd Cycle by NAAC, CGPA 2.11
ESTD. 1990
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Prof. Ishwar S. Mohurley
Principal

I have great pleasure to write a few words with regard to the publication, ZOONIVERSE from the Department of Zoology. It is the continuous best practice of the Department in collaboration with students of Zoology and their maximum participation of the students. The Department provides the students an opportunity to express their creativity through the ZOONIVERSE.

Students are the centre point of the ZOONIVERSE in which their creative writings, their achievements, activity, projects, tours, seminars, photos of meritorious students are highlighted.

The outgoing students will always carry the memories of their campus life forever in life. Through different activities, Zoology Department is one the vibrant department of the institution.

I wish to congratulate all the students of Zoology and the Head of the Department and staff members of the department for the task of publishing, ZOONIVERSE of the academic session 2022-23. I hope this academic session's ZOONIVERSE is also reflecting the creativity and innovations of the students.

Once again I wish all the best to the publication, ZOONIVERSE.

Prof. Ishwar S. Mohurley
Principal, SSJC

IQAC Coordinator's Message

Dr. K. J. Sibi
IQAC Coordinator

I have great pleasure to write a few words with regards to the publication, Zooniverse-23 from the department of Zoology. It is the continuous best practice of the department in collaboration with students of Zoology and their maximum participation. The department provide the students an opportunity to express their creativity through the Zooniverse-23.

Students are the centre point of the Zooniverse in which their creative writings, their achievements activity, projects, tours are highlighted.

I wish to congratulate all the students of the Zoology and the entire staff of the department for the task of publishing Zooniverse-23 of the academic year 2022-23.

Dr. K. J. Sibi

IQAC, Coordinator, SSJC

DEPARTMENTAL REPORT 2022-23

Department of Zoology was established in 2008. The department offers six semester undergraduate course in science (CBZ & CMZ), also offers one certificate course on "Vermicomposting Technology". The department is having a well equipped laboratory, which fulfills the need of B. Sc. Zoology and Research in Zoology. The key research areas of the department are Biodiversity and the Environment Impact Assesment (EIA). The department inspires students to participate in various activities like intercollegiate seminar competition, biodiversity surveys and s,mall research projects. Department also encourages the students for various competitive examinations. Department also regularly organises the guest lectures, social activities like environment conservation, plastic free environment awareness through SSJ Safai bank. Faculty members of the department contributed in different committees in college, university and also in state government department.

Highlights of department of Zoology

- *Certificate course in Vermicomposting Technology*
- *S.S.J. Safai Bank*
- *National conference on "Biodiversity and Wetland Conservation NCBWC-2023)*
- *Digital cataloging of museum specimens (QR Coding)*
- *Papers published in journals in 2022-23- 05*
- *Chapters published in books in 2022-23- 02*
- *Poster presented in conference in 2022-23- 04*
- *Mou – 02*
- *Academic book – 02*

Faculty profile

1. *Dr. Gopal T. Paliwal (M. Sc., M. Phil, Ph.D.), Head & Associate Professor*
2. *Dr. Manoj K. Bangadkar (M.Sc., SET, Ph.D.), Assistant Professor*
3. *Mr. Rupchand Y. Dongarwar (M. Sc., NET, SET), Assistant Professor (CHB)*

DEPARTMENTAL ACTIVITIES

A. STUDY TOUR TO GOVERNMENT FISH SEED PRODUCTION CENTRE SHIVANIBANDH AND KRUSHI VIGYAN KENDRA, SAKOLI

A one day study tour to Government Fish Seed Production Centre, Shivanibandh and Krushi Vigyan Kendra, Sakoli on dated 29 August 2022 for the students of B. Sc. Semester V. 50 students of semester V accompanying with faculty members Dr. Gopal Paliwal and Dr. Manoj Bangadkar were participated.

Group photo in KVK Sakoli with Dr. Usha Dongarwar mam, Shri. Parwate sir and Shri Layant sir on dated 29th August 2022


Live demonstration of Chinese Hatchery


Brooders handling by students


Group photo at Govt. fish seed production centre, Shivanibandh

Principal, Prof. Ishwar Mohurley sir flagging off the educational trip to Govt. Fish Seed Production Centre, Shivanibandh and KVK, Sakoli on dated 29th August 2022

B. INAUGURATION PROGRAMME OF THE ZOOLOGICAL SOCIETY

The zoological society of the Department of Zoology, S. S. Jaiswal College Arjuni/Mor. was inaugurated by the hands of Prof. Ishwar S. Mohurley, Principal S. S. Jaiswal College Arjuni/Mor., Shri. Manishaji Rajankar, Director FEED, Dr. K. J. Sibi, IQAC Coordinator, S. S. Jaiswal College Arjuni/Mor., Dr. Deshmukh, Head, Department of Microbiology, S. S. Jaiswal College Arjuni/Mor. and Dr. Gopal Paliwal, Head, Department of Zoology, S. S. Jaiswal College Arjuni/Mor. on dated 04/04/2023.

All members of Zoological society 2022-23

Exchange of MOU with Shri. Manishji Rajankar, Director FEED

C. BIG BUTTERFLY MONTH CELEBRATION

Big butterfly month was celebrated in S. S. Jaiswal College, Arjuni Mor. in the month of September. As a part of big butterfly month celebration students of our college were involved in the various activities like photographing butterflies, butterfly drawing, butterfly videography and butterfly walk was organized on dated 23 September 2023. All the students of the B. Sc. of our college were actively engaged.

Big Butterfly Month Celebration


Butterfly walk in SSj, College Campus

D. WILDLIFE WEEK 2022 CELEBRATION

Department of Zoology and Zoological society jointly organized Wildlife week 2022 in S. S. Jaiswal College Arjuni Mor. from dated 02/10/2022 to 07/10/2022. As a part of wildlife week celebration, following programmes were organized:

- Inauguration of wildlife week
- PPT presentation competition
- Poster presentation competition
- Rangoli competition
- Essay writing competition
- Slogan writing competition
- Nature camp to Navegaon National Park

Inauguration of wildlife week 2023 by the hands of Principal, Prof. Ishwar S. Mohurley sir and Chief Guest Dr. Tare sir

Poster Exhibition

Rangoli Competition

Rangoli Competition

PPT Presentation Competition

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Wildlife Week, workshops held in Gondia, Navegaonbandh

■ District Correspondent

GONDIA, Oct 6

THE Wildlife Week was organised in Gondia and in Navegaonbandh sub-division. Taking significance of the entry of wild elephant herd near Navegaonbandh, awareness programme on protection and measures from elephant was held where people were acquainted with the nature, characteristics and their importance in the ecological system.

On October 2, workshops were organised at Gondia, Navegaonbandh under the joint aegis of Gondia Forest Department, NNTR (Navegaon Nagzira Tiger reserve) and Hirwal NGO. Assistant Conservator of Forest Dada Raut, ACF BV Patil, RFO Sachin Dongarwar, Bhimrao Lade, Rupesh Nimbarte and noted wildlife enthusiast Dr Gopal Palliwal were chiefly present.

Dr Palliwal delivered the lecture on the introduction to the spiders of NNTR. He shared the information on the species of spiders which were found in Gondia. Similarly, Lade shared his knowledge on the water bodies and his diversity of Navegaonbandh. The students present on the occasion had also a walk in the park.

Students of Shivprasad Sadanand Jaiswal College, forest officials, members of NGOs and others attended the workshop in good numbers.

One of the dignitaries addressing the workshop.

E. NATURE TRAIL AT NAVEGAON-NAGZIRA TIGER RESERVE (NNTR)

As a part of wildlife week celebration, A Nature trail was organized at Navegaon-Nagzira Tiger Reserve (NNTR) on dated 02/10/2022. The programme is in collaboration with Department of Forest, Government of Maharashtra and Hirwad NGO, Gondia. Total 20 students of the college accompying with faculty members Dr. Gopal T. Paliwal, Dr. Manoj K. bangadkar and Mr. Rupchand Y. Dongarwar were participated.

Nature Trail at Navegaon-Nagzira Tiger Reserve (NNTR)

Nature Trail at Navegaon-Nagzira Tiger Reserve (NNTR)

Nature Trail at Navegaon-Nagzira Tiger Reserve (NNTR)

F. FIELD VISIT TO GOVERNMENT TASAR SERICULTURE CENTRE, ARJUNI MOR.

Department of Zoology, S. S. Jaiswal College Arjuni/Mor. has organized a one day field visit to Government Tasar Sericulture Centre Arjuni Mor., Dist Gondia on dated 21st November 2022. The field visit is for the students of B. Sc. Semester V to know the practical knowledge about the silkworm rearing, management of the nursery, grainage house management and reeling process.

Group photo at Govt. Tasar Sericulture Centre, Arjuni Morgaon, Dist Gondia

Demonstration of Tasar Sericulture at Govt. Tasar Sericulture Centre, Arjuni Morgaon, Dist Gondia

Silk weaving observed by students

G. TWO DAYS NATURE CAMP AT NAVEGAON NATIONAL PARK, DIST GONDIA

As a part of bird week 2022 celebration, Department of Zoology, S. S. Jaiswal College, Arjuni Mor. was organized a Two days Nature Camp at Navegaon national park, Dist gondia on dated 12th and 13th November 2022. The programme was in association with Maharashtra Forest department, hirwad NGO, Gondia and NNTR.

Garlanding of Dr. Salim Ali photo

Inauguration of Nature camp by the hands of Principal Prof. Ishwar S. Mohurley sir

Bird watching during Nature camp

Exchange of MOU with Shri Nimbarte sir, Director, Hirwad

H. WORLD WETLAND DAY CELEBRATION

World wetland day was celebrated by the department of Zoology on dated 02nd February 2023. Prof. Shrikant Nahade, Dr. K. J. Sibi, Prof. Ajay Raut, Dr. Gopal Paliwal, Dr. Manoj Bangadkar and about 75 students of the B. Sc. were present. Dr. Gopal Paliwal gives the presentation of Wetland conservation on this occasion.

World wetland day celebration on dated 02nd Feb. 2023

Lecture on Wetland conservation

I. NATIONAL CONFERENCE ON, "BIODIVERSITY AND WETLAND CONSERVATION (NCBWC-23)"

A national conference on, "Biodiversity and Wetland Conservation (NCBWC-23)" was organized by the Department of Zoology, S. S. Jaiswal College Arjuni/ Mor. in association with FEED, NNTR and Hirwad on dated 24th February 2023. About 200 delegated were participated in the event. Conference includes Keynote talk, Invited lectures and Poster Presentation. On the eve of the conference, all the participants were enriched with the knowledge of biodiversity and wetland conservation. In this conference poster presentation were held and best poster presentation awards were achieved by Ms. Ankita Sharma, Dr. D. L. Chaudhary, Dr. Chhanda Samrit and Dr. D. N. Lanjewar. Awards were given to the eminent Academicians and Environmentalists for their significant contribution in the field of Environmental conservation.

Brochure of National conference (NCBWC-23)

Sauvenir release ceremony at NCBWC-23

Photo exhibition inaugurated by the hands of Prof. Vidya Baile in NCBWC-23

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One-day NCBWC-2023 organised at Jaiswal College

■ Our Correspondent
ARJUNI MORGAON, Mar 16

A ONE-day National Conference on Biodiversity and Wetland Conservation (NCBWC-2023) was successfully organised by Department of Zoology and IQAC at Shivprasad Sadanand Jaiswal College, Arjuni Morgaon and in association with Hirwal Bahuuddeshiya Sanstha Gondia, Foundation for Economic and Ecological Development (FEED) and Navegaon Nagzira Tiger Reserve (NNTR).

More than 250 delegates participated in the conference. A souvenir was released at the hands of guests and a photo exhibition on wetland, biodiversity and water birds of Gondia district was also inaugurated.

The conference was inaugurated at the hands of Prof VidyaV Baile, ex-professor and Head, PGTD Zoology, RTM Nagpur University, Nagpur. Professor Varsha Dhurve, Head, PGTD Zoology, RTM Nagpur

The dignitaries during the one-day NCBWC-2023.

University, Nagpur, was the chief guest. Mukesh Jaiswal, Secretary, Shri Durga Shikshan Sanstha Arjuni Morgaon, Dada Raut, Logging Officer Navegaon Bandh, Sachin Dongarwar, RFO (Wildlife), NNTR, Rupesh Nimbarte, President, Hirwal NGO, Dr K J Sibi, IQAC Coordinator of college, Dr Gopal T Paliwal, Organizing Secretary were prominently seated on the dais along with Prof Ishwar S Mohurle, President and Convenor of the conference.

The keynote address was delivered by Dr Rajkumar Khapekar, Head Depa of Botany, DRB Mahavidyalaya, Nagpur, on topic 'Biodiversity and ways of lake Ecorestoration'. For the first technical session chaired by Dr M F Jadhav, Head Department of Zoology, S N Mor College, Tumsar, the speaker was Dr Lal Singh, Sr Scientist, CSIR NEERI. He delivered a talk on topic 'Eco-Rejuvination of Fly Ash Degraded/ Contaminated Land for Socioeconomic development in rural areas'.

Dr Gopal T Paliwal, Organizing Secretary, while making the introductory speech informed that

of the Eastern Vidarbha. There are small water bodies existing in most of the villages and these ponds are mainly used for agriculture and fish farming in traditional way. Currently, these wetland habitats are in danger due to increasing pollution, expansion of agriculture in wetland areas, excessive use of pesticides and chemical fertilizers in agriculture. He stressed on need to protect and restore the biodiversity.

Dr L P Nagpurkar, Head, Department of Chemistry, M B Patel College, Sakoli was the speaker of Second technical session chaired by Dr Sudhir Bhandarkar, Head Department of Zoology, M B Patel College Deori, in which he delivered a talk on topic, "Wetland Avifauna and Biodiversity Conservation".

Speaker for the third technical session was Manish Rajankar, Director FEED, topic of his talk was "Role of dependent communities in the wetland and biodiversity con- on". session was chaired by

Dr Nitin Meshram, Head Department of Zoology, S K Porwal College, Kamptee.

During conference, about 40 participants were presented their research posters on the sub themes of the conference. And the best poster presente awards were awarded to. Ankit Sharma, Dr D L Chaudhary, Dr Chhanda Samrit and Dr D N Lanjewar.

For the valedictory function Dr Suresh Masram, Associate Professor, PGTD Zoology, RTM Nagpur University, Nagpur, was the chief guest. Eminent academicians and environmentalists were honoured at the conference for their significant contribution towards environment conservation.

Those honoured includes Dr Sudhir Bhandarkar, Prof Bhuwanendra S Rahile, Rupesh Nimbarte, Bhimrao Lade.

The programme was jointly anchored by Dr Ashish Kawle and M D Dhuratkar and vote of thanks was proposed by Dr Gopal Paliwal. All the teaching and non-teaching staff people worked for the success.

News of NCBWC-23 in Newspaper

Student Articles

THE FASCINATING WORLD OF BUTTERFLIES: AND THE NEED FOR THEIR CONSERVATION

Ms. Savita R. Sonwane

We need butterflies because they are the bio-indicators and can sense the slightest alteration in an ecosystem. We should all come together and join hands to conserve these magnificent creatures.

Butterflies are beautiful creations of nature that along with the moths, make up the insect order Lepidoptera. Butterflies are almost worldwide in their distribution and are highly sensitive indicators of the health of the environment and play vital roles in the food chain as well as being pollinators of plants. In this article, Dr Surya Prakash throws light on the brief history, behaviour and life cycle, and threats and conservation efforts to save butterflies. He feels that we should all come together and join hands to conserve these magnificent creatures. We need butterflies because they are the bio-indicators and can sense the slightest alteration in an ecosystem.

Butterflies are all around us, in almost every part of India except very high snow-clad mountains where the temperature is very low and below the freezing point where these tiny cold-blooded creatures cannot survive. We all have grown up watching butterflies and the next generation is also fortunate enough to do the same. I still remember how often after my school hours, I would slip into a park near my house along with my younger brother in Pali (Rajasthan) and spend my afternoon chasing and admiring butterflies. Butterflies have always impressed everyone and their reputation of being the 'Brand Ambassador of Insects' is apt because of their mesmerizing and adorable beauty. This also reminds me of something the American science fiction author, R H Heinlein, once said 'Butterflies are self-propelled flowers .Butterflies draw our attention for countless reasons that of course include their beauty, unique life history, various adaptations in compliance with the habitat they live in, their migration, and many more such aspects. Butterflies are the creatures with two pairs of 'scaly' wings and three pairs of legs, abdomen, head with two compound eyes, and a thorax. They belong to a group of insects called 'Lepidoptera' that includes moths also with them. Lepidoptera is a Greek word that refers to 'lapis' meaning scales and 'pteron' meaning wings. These iridescent scales are arranged in a particular formation that can be compared with the tiles of a village hut and when they are touched, these scales stick to our fingers. We need butterflies because they are the bio-indicators and can sense the slightest alteration in an ecosystem. Their richness in an ecosystem is also influenced by many environmental factors like humidity, temperature and availability of larval host plants because butterflies lay eggs only on specific plants known as larval host plants. Butterflies can be seen everywhere, basking on rocks, on ground perched on a dead animal and sucking body fluids, on rotting fruits sipping alcoholic juices or mud puddling on a wet patch of soil and sipping minerals and salts.

Brief History

India is one of the mega biodiversity countries where nearly 1500 species and subspecies are found of the 17,000 species worldwide, and interestingly nearly 20 per cent of them are endemic to this region, thus, making India a hotspot of butterfly diversity in the world. The largest one is the Southern Birdwing with a wingspan of 190 mm whereas the smallest one is the grass jewel with a

wingspan of only 15 mm. There is another species called the Blue Pigmy butterfly, which is found in Southern California and is also amongst one of the smallest.

Butterflies have a long association with humans. If we look into ancient history, we would find the mention of butterflies in folklores, fairy tales, poetry, Mughal art, and so on, and probably that is the reason we still hear the word titli in many of our Hindi songs. Many fashion designers get inspired by their wing patterns and it is depicted in their respective works. When we talk about the nomenclature of butterflies, we have to go back to the history of the British Era in India, in particular to their army as many of them were naturalists and had given names to Indian butterflies in the same way as the ranks in their army. To name a few Commodore, Sailor, Sergeant, etc., and when those ranks got exhausted, they used Indian royal. Names, such as raja, queen, nawab, emperor, and so on. They used the names of birds, animals, plants, trees, etc. Where they could not find anything matching with the butterfly, they named it something funny like 'Monkey Puzzle', a butterfly found in India. The world still follows the same nomenclature even today. Edward Donovan, an epitome of the natural history of insects in India and Indian seas, extensively worked on Indian insects. Today, butterflies have been broadly classified into two major categories, that is, Papilionidae also called true butterflies, and Hesperiidae that includes the skippers.

Behaviour and Life Cycle

Any living creature on the planet with small size has evolved with various defense strategies to survive and to co-exist with different predators. Charles Darwin rightly postulated the theory of survival in his famous book the origin of species that says that only those survive who are selected by nature as the fittest ones. Butterflies are quite efficient in this regard and their behaviour revolves around survival mechanism be it ovipositional behaviour or feeding, mud-puddling to roosting, mimicry to polymorphism (multiple forms of one species) and much more. Everything is focused on self-defence which they are either born with or have eventually acquired and adapted to for their existence.

The adult butterfly is the last stage in its life cycle, which is very short and is species-specific, that could be 4–6 weeks or even 4–6 months depending on the species. Therefore, immediately after its emergence from the pupa, it has to fly and look for a mate. Also, depending upon the climatic conditions such as humidity, temperature and more, they have two seasonal forms called 'dry season form' and 'wet season form'. When an adult flies, it sprays its pheromones (ecto-hormones) to attract a mate and marks its presence in the given habitat. An adult butterfly hardly feeds as most of the feeding is done during their larval stages, but they need proteins, salts and other useful food supplements apart from the carbohydrates which they have fed upon from the host plants sources with very little salts during the larval stage. The butterfly larvae are voracious feeders and their future is decided by the host plant on which their mothers have laid eggs on. Depending upon species, the caterpillar could be mono, oligo or polyphagous in their feeding, which means the caterpillar can feed on a single host plant or a couple of others of the same genera or many other varieties as well.

The moment a caterpillar emerges from an egg, it eats its eggshell and removes the evidence of its presence from

predation. Eggs of various colors, shapes, and sizes depending upon species are laid either in ones or in clusters under the surface of leaves depending upon species. Larvae are also vulnerable to predation, hence, have evolved some very interesting self-defence strategies. For example, some caterpillars secrete sugary syrups which are consumed by ants, and in return, they protect them from other predators. This association is called commensalism. There are some species of flies that lay their eggs on the butterfly larva and their larvae feed on butterfly caterpillars; this parasitism eventually kills them prematurely. Therefore, it has evolved a defence organ called 'osmeterium' which has toxic secretions that is also species-specific and contains aliphatic acids, monoterpenes hydrocarbons, sesquiterpene compounds and esters which a caterpillar uses when threatened by everting its osmeterium and releasing toxic secretions on the predator. Eventually, the larva grows bigger after undergoing many changes and ultimately hangs itself upside down from a solid object and becomes 'J' shaped which is called 'pupa' or 'chrysalis'. Further developments take place inside the pupa. After a couple of weeks (depending upon species) the pupa shell breaks and an adult butterfly emerges out usually in the mornings. It sits on the pupa case and dries its wings in the sunlight. 'Haemolymph' (butterfly blood) flows into the veins of wings and they stretch after some time that enables an adult to fly and mate again. This entire process of transformation from an egg to an adult is called metamorphosis. Mating is not that simple as it seems to be. Males have to search and find females. During these search operations, males have to feed and accumulate various salts, minerals and other food supplements to prove their superiority to other males in front of the females.

Butterflies feed mainly on carbohydrates which they get from their respective plant sources during their larval stages and to get other nutrients, minerals and salts, they have to do a lot of mud puddling on the wet soil and sip various alkaloids and other nutrients from many different plants and other sources like rotten fruits as well as dead animals. All these nutrients generally are obtained and stored by males and presented to their female counterparts while mating as 'nuptial gifts' because females do not possess them but need them for healthy offspring. Males, while patrolling, spray their male pheromones and watch females. Sometimes, they perch on a higher branch of a tree in their territory. On seeing the females, they chase them and start flying together for few minutes to hours before settling down and mate. Mating is not solemnized without the consent of the female. Isn't it worth learning from these tiny creatures that consensus and harmony is of utmost importance in human relationships also?

Whatever activities like mud puddling, roosting, migration, etc., a butterfly does, it prefers to do it in a bigger group so as to protect itself from predation even if few individuals have to be sacrificed during the attack in a big group—again an evolutionary survival strategy. Many species of butterflies in India migrate from the plains to the Western Ghats during the North-East monsoon and from the Western Ghats back to the plains during the South-West monsoon to breed and to avoid extremely harsh weather conditions. Interestingly, migration is triggered and planned by a butterfly while inside the pupa as they can sense favourable or adverse environmental conditions in this stage.

Their migration is not like bird migration because their next generation performs the return migration journey because of their short life span. In self-defence, the butterflies also exhibit two types of mimicries, one is Mullerian and the other one is Batesian in which palatable species mimics warning signals of non-palatable one to protect itself from predation. Mimicry is observed broadly amongst the females because they have to propagate the next generation and hence need more protection. Mostly beautifully coloured butterflies have a lot of toxic compounds deposited on their wings or in other body parts to keep the predators away from them and predators.

Threats and Conservation

Like other animals, butterflies have many natural predators such as insects, birds, spiders and lizards but the most dangerous one is the man. There are many species of butterflies which are smuggled to China, Taiwan and many other international markets of various countries from India. They are also killed and framed for decoration and other ornamental value. This reminds me of the famous documentary film directed by Sonya V Kapoor and produced by the British Council in 2006 titled once there was a purple butterfly. The film depicts illegal trade—how these beautiful insects are captured and transported alive or dead to the international markets of other countries in the world. In many countries, they are released in large numbers during wedding ceremonies at night when they can't fly and die.

The use of pesticides in India is another serious threat to butterfly conservation as they lay eggs only on our native species of plants. As I have pointed out that their life is very short and on the top of that, out of every hundred eggs laid only one or two reach maturity and that makes them more vulnerable. In

our country, very less studies have been done on butterflies but there is hope because at the Indian Institute of Science, Bengaluru, where a group of scientists has started compiling and re-documenting them in a scientific manner with the help of citizen scientist programmes and has developed a web page 'ifoundbutterflies.org' where amateur nature enthusiasts can upload their photos from all over the country helping them to generate data. Till date, they have uploaded around 1400 species of butterflies from India. Also, our Hon'ble Prime Minister, Shri. Narendra Modi, recently inaugurated a butterfly park in Gujarat which will also motivate many other states. The writer himself is involved in the conservation of these tiny creatures and is spreading awareness about butterflies in Delhi-NCR individually and in collaboration with WWF-India, BNHS, IIC, JNU and more, and has published posters, pocket booklets and a calendar on butterflies to inculcate awareness among the youth and the common people. Let us come together and join hands to conserve these magnificent creatures called butterflies.

.....

NAVEGAON NATIONAL PARK

Ms. Swati N. Salame

Navegaon National Park is a National park located in the Arjuni Morgaon subdivision of Gondia district in state of Maharashtra, India. The Dr Salim Ali Bird Sanctuary, Navegaon is home

to almost 60% of the bird species found in entire Maharashtra. Every winter, flocks of migratory birds visit the lake. The national park has diverse type of vegetation ranging from dry mixed forest to moist forest. The forest type is 5 A/C3. Southern tropical dry deciduous forest.

Significance

It was established 22 November 1975 and is located in the eastern part of Maharashtra state and covers an area of 133.78 km^2. It has great importance from nature conservation point of view. It is indeed nature priceless assets and beckons one and all to enjoy its picturesque landscape, its pure and fresh air. It has got immense potentials from biodiversity conservation point of view. One can also join the jungle safari and stroll through the beautiful forest, crossing paths with leopards, sloth bears, gaurs, sambars, chitals and langurs. Staying in the unique tree-top house, riding a power or sail boat on the lake, are thrilling pastimes. Nearly 50,000 tourists visits this tourist complex annually. Places of interest around the national park are Nagzira Wildlife Sanctuary (60 km), Itiadoh Dam (20 km), Tibetan Camp at Gothangaon (15 km) and Pratapgad (15 km).

Ecological or environmental values

It is an important conservation unit in Central India in general and Vidarbha in particular. It acts a "Green-lung" for the adjoining human settlements and helps in maintaining the environmental balance.

Zoological values

Though Navegaon is better known as a bird sanctuary, a number of wild animals could also be sighted. The vertebrate fauna includes, besides a number of fishes, 209 species of birds, 9 species of reptiles and 26 species of mammals which includes Tiger, Panther, Jungle cat, Small India Civet, Palm Civet, Wolf, Jackals, Bisons, Sambars, Nilgais, Chitals, Wild boars, Sloth Bears, and Nathan Lewis in this national park.

Botanical values

One of the unique features of this sanctuary is the existence of diverse vegetation type ranging from dry mixed forests to moist forests. Its forests belong to the category of "Southern Tropical Dry Deciduous Forests" – 5A/C3 as per the revised classification of the forests by Champion and Seth. This sanctuary serves as a living repository of various economical, medicinal, aromatic, ornamental plant species. It includes, Teak, Haldu, Jamun, Kawat, Mahua, Ain, Bhel and Bhor.

Geological values

This sanctuary exhibits an amazing diversity of terrain and the altitude ranges from nearly 30 meters to about 702 meters above the mean sea level, which is the highest point of the sanctuary. The typical geological formations are Sakoli Series having number of formations made of phyllites, slates, chlorites etc. and Saucer Series. The rocks of the two groups appear to show difference in chemical composition of lime bearing rocks. The mineralogical difference is that the rocks of Saucer group commonly contain Felspar and Biolite but no chlorite whereas those of Sakoli group contain invariably chlorite, rarely Biolite and no Felspar. All this is coupled with a diversity of terrain having steep ridges, narrow valleys and deep gorges with varying altitude

Threats

Human-wildlife conflict is common, with killing of domestic livestock by tigers and leopards as a frequent phenomenon in the areas neighbouring villages. This has an adverse impact on the economic condition of the local people and results in antagonism towards the management. In many years there have been up to 3 people and 30-50 cattle heads killed by tigers and leopards.

NATURES BEAUTY

Ms. Harsha M. Kapgate

NATURE HAS A GREAT SIMPLICITY AND THEREFORE A GREAT BEAUTY.....

Everything we see around us constitutes nature, including the sun, the moon, trees, flowers,

fruits, human beings, birds, animals, etc. In nature, everyone depends on one another to keep the ecosystem healthy. For survival, every creature is interrelated and reliant on one another.

Nature is the mother of all, as it helps to sustain our life. It is our companion since eternity. Despite the importance of nature in human life, we are spoiling its balance only due to our greediness. Millions of years ago, when the knowledge of man was not better than an animal

Nature is the creation of natural material and physical world on earth independent of the human activities. The beauty and richness of nature is diverse and massive. Nature provides us with several delicacies to enjoy and is our life support system. Our basic needs like food, shelter, water and air are all the gifts from nature. Humans have a strong connection and interrelation with nature. Escaping away in the nature heals the mind and body and soothes our soul. Irrespective of what nature provides us it is also our moral and social responsibility to nurture nature.

Nature has given us so much that we

cannot even imagine. Life on this earth is possible only because of nature. There are many other planets in the universe but without this nature life is not possible there. Thus nature is the basis of our life. Nature is not the same everywhere on earth. According to the place, nature changes its appearance and according to that place provides us with resources, as well as provides comfort to our mind, our eyes.

Nature gives us so much, so it is our duty to respect it knowing its importance and not to destroy it for our selfishness. So that the children of man can also enjoy its beauty and take advantage of it. Otherwise one day will be when people will be able to see and feel the beauty of this nature on the computer itself

NATURE ALWAYS WEARS THE COLOUR OF THE SPIRIT.....

THREATENED BIRDS

Mr. Sahil R. Borkar

Birds are omnipresent, add life, color and sound to our lives with their intrinsically beautiful feathers and melodious songs. They are recognized as one of the most important indicators of the State of the Environment. Changes in bird populations are often referred to as the first indication of environmental problems. A decline in bird population tells us that we are damaging the environment through pollution, human activities by destroying their habitat, habitat fragmentation and destruction, pesticides, alien or invasive species, and many other impacts. Birds are a part of the balance of nature. There is strong interdependence between all living things in the gigantic web of life and the removal of even the smallest form of life may in time endanger the entire structure.

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Sr. No.	Scientific Name	Common Name	Status
01	*Anhinga melanogaster*	Oriental Darter	**NT**
02	*Threskiornismelano cephalus*	Black headed Ibis	**NT**
03	*Mycteria leucocephala*	Painted Stork	**NT**
04	*Ephippiorhynchus asiaticus*	Black necked stork	**NT**
05	*Leptoptilos javanicus*	Lesser Adjutant Stork	**VL**
06	*Ichthyophaga ichthyatus*	Grey headed Fish eagle	**NT**
07	*Gyps indicus*	Long billed Vulture	**CR**
08	*Neophron percnopterus*	Egyptian Vulture	**EN**
09	*Grus antigone*	Sarus Crane	**VL**
10	*Limosa limosa*	Black- tailed Godwit	**NT**
11	*Sterna aurantia*	River Tern	**NT**
12	*Anthracoceros coronatus*	Malabar-Pied Hornbill	**NT**

NT: Near Threatened, **VL**: Vulnerable, **CR**: Critically Endangered, **EN**: Endangered

Why Threatened birds?

Some of the threats to become critically endangered of these bird species could be due to clearing of forest, human interference, trapping of birds, creation of new pastures, growing of dry land crops, quarrying, construction, degradation of lowland forests and wetlands through direct exploitation and disturbance by humans. Human

disturbance also leads to high incidence of nest desertion. Burning and cutting of trees, conversion of the bird's grassland habitat for various purposes including agriculture is mainly responsible for its population decline

1. Oriental Darter:

This species is classified as Near Threatened (NT) because of its population is declining moderately rapidly owing to pollution, drainage, hunting and collection of gees & nestlings (Birdlife International 2013). A sleek water bird, mainly black in adult stage, like the cormorants but with longer more slender snake-like neck, narrow head & long straight pointed bill. The Oriental Darter is widespread in India from coastal wetlands to c.300 m in the Himalaya. In Maharashtra, it is widespread in small numbers &can be found in any large wetlands, natural or man- made. The fish eating bird inhabits shallow inland wetlands including lakes, swamps & reservoirs, where it hunts fish & frogs. It is as expert diver & feeds almost exclusively on fish caught by its stiletto-shaped bill. It nests colonially with egrets, storks & herons. It makes a platform nest, sometimes very close to other nests & lay 3-6 eggs.

2. Black headed ibis:

Black- headed Ibis is undergoing a population reduction which is suspected to be moderately rapid. It faces the entire gamut of threats; from hunting & disturbance at breeding colonies to drainage & conversion of foraging habitat to agriculture. Consequently it qualifies as Near threatened (Birdlife International 2013). A common resident, showing seasonal local movements, it is a large hen-sized bird with black neck, naked black head & long stout down curved black bill, as well as black legs. Breeding of Black-headed Ibis was recorded from March to June. D'Abreu (1923) has mentioned it as a breeding resident in Vidarbha where it is found in all districts at some wetlands in small numbers. The Blackheaded Ibis is found in all types of wetlands such as paddy fields, freshwater marshes, lakes, rivers, flooded grasslands, tidal creeks, mudflats, salt marshes & coastal lagoons. It feeds almost entirely on animal matter such as frogs, fish, aquatic insects, crustaceans & worms. It nests colonially with other heronry species such as painted storks.

3. Painted Stork:

Painted stork is one of the most abundant of the Asian storks. It is classified as Near Threatened (Birdlife International 2013) because it is thought to be undergoing a moderately rapid population decline. Painted Stork is a long-legged, long necked, lanky bird, less than a meter in height, found in all types of wetlands. It has a long heavy yellow bill & unfeathered waxy yellow face. Head, neck, breast & back white with closely barred belly band & white wing coverts. It is a common resident bird. The Painted Stork frequents freshwater marshes, lakes & reservoirs, flooded fields, rivers or lakes & in the rainy season can be seen in crop fields. It nests colonially in trees, often along with other water birds. The bird arrives before winter in traditional areas & usually nests on selected trees using sticks & leaves. Though it is a Near Threatened species painted stork is sound in almost the whole of the Maharashtra. The breeding season is from February to June (Barnes 1891). A flock of about 25 birds was seen at Sonegaon lake of Arjuni/Morgaon taluka

4. Black-necked stork:

Birdlife International (2013) justifies the inclusion of Black-necked stork in the Near Threatened category as it has undergone a moderately rapid overall population reduction. A characteristically large bird between 130 &150 cm tall with bright red legs, white body, extensive black on the wings & tail, & notably a glossy iridescent black head & neck with large black bill. Genus

Ephippiorhynchus is unique among storks in exhibiting sexual dimorphism in coloration: iris dark brown male & yellow in female. Like most storks, the Black-necked stork flies with its neck outstretched, not retracted like a heron. The wingspan is up to 230 cm. The Black necked stork is

found all over the Indian plains, common nowhere but widespread. It is thinly but widely distributed in suitable wetlands. The Black-necked stork prefers large marshes & Jheels and margins of large rivers &brackish lagoons, where it feeds on fish, frogs, snakes, small turtles. In summer, when jheels & ponds dry up & food is reduced, it becomes more aggressively territorial & frequently fights over food & space.The nest is built on large trees, mostly near water. If undisturbed the same tree is used year after year. Thefemale lays two to four eggs & both parents incubate & raise the chicks. Nests were found even in densely populated areas, frequently close to roads & human habitation.

5. Lesser Adjutant Stork

Because of small declining population lesser Adjutant stock is listed as vulnerable. It is the smallest member of genus Leptoptilos but still a large bird of 122-129 cm height, weight about 5 kg & has a 210 cm wing span. It is dark grey-black above, white below, with naked head & neck, & a dirty yellowish massive wedge-shaped bill. Breeding males show coppery spots on median coverts, narrow whitish edges to lower scapulars, tertials & inner greater coverts & redder sides to the head, juvenile is duller & less glossy above. Lesser Adjutant has an extensive range across South & Southeast Asia. It is found all over India, particularly in well-watered tracts. Lesser Adjutant is an adaptive species found in forest pools, shallow open jheels, man-made wetlands, edges of reservoirs. It feeds on fish, frogs, crabs, snakes, small birds, any small prey. It nests on tall trees preferably in forests. Nesting is either in loose scattered colonies, sometimes up to eight nests found in a tree or solitarily. Breeding season varies from area to area.

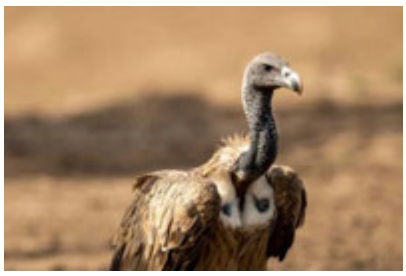
6. Grey headed fish- eagle

A medium-sized raptor, 69 to 74 cm, with grey head, neck, nape and breast, merging with the

paler brown of the mid-belly. Abdomen flanks, and tail are white. Upper parts brown, darker on the wings, turning to blackish on quill tips. Terminal tail band dark brown, particularly visible in flight. Sexes are alike. Juvenile streaked overall, except on belly and vent, with white under wings and lightly barred flight feathers and tail. Although widely distributed, the species is local and declining in most parts of its range through loss of forested wetlands. It is found near slow-moving rivers and streams, lakes, reservoirs, and tidal lagoons. Can be seen sitting for hours on a tree bough, overlooking a sluggish stream or a pool, waiting for an opportunity to snatch fish. If undisturbed, can be seen in the same favourite spot for many months. It feeds exclusively on fish, sometimes very large ones, but during the breeding season it pursues birds and small mammals also. It is very territorial and makes a large nest with sticks on a tall tree. Sometimes the same nest is used year after year, and thus becomes bulky due to yearly addition of twigs and sticks. The bird becomes noisy during the breeding season. It breeds during winter from November to January. Two to four eggs are laid and both parents share incubation duties (female more). Incubation period to be 28-30 days and nestling period is about 80 days.

7. Long-billed Vulture

The Long-billed Vulture Gyps indicus is classified as Critically Endangered (CR) by Birdlife



International and IUCN because it has suffered an extremely rapid population decline as a result of

feeding on carcasses of animals treated with the drug diclofenac. A large vigorous vulture of about 92 cm, with a conspicuous white neck-ruff and a long black neck, with pale down feathers. It is mainly found south of the Gangetic plain in Delhi, Uttar Pradesh, Haryana, Rajasthan, Gujarat, M.P., Bihar, Jharkhand, Chhattisgarh, Maharashtra, Karnataka, Andhra Pradesh. It is a semi-endemic species in India and also has a small population found breeding in southeast Pakistan, in the Sind province. Now it is scare. Like the White backed, the long-billed vulture inhabits open countryside, and is found in villages, near cultivated areas. It is a scavenger and feeds almost entirely on carrion, often with the White-backed vulture. It nests almost exclusively in small colonies on cliffs and ruins, sometimes on trees where cliffs are absent. It is mainly a resident bird with a large home and returns to same cliffs for roosting at night. Nesting colonies are traditional and used year after year, and are clearly visible due to the white fecal markings below the nests.

8. Egyptian Vulture

The Egyptian Vulture Neophron percnopterus is perhaps the most widespread vulture of the old world, with isolated resident populations in Central Asia to India, and Nepal. In its wide range, it is declining rapidly; therefore Birdlife International (2013) has listed it as Endangered. It is a long-lived and slowbreeding bird with very few predators on adults. In India good populations used to be present 20 years ago, has also seen a sharp decline. Birdlife international (2013) estimates its total world population between13000-41000 mature individuals. Most critically, the species has undergone a catastrophic decline (>35% per year) since 1999 in India, where numbers detected on road transects declined by 68% between the years 2000 and 2003 . The Egyptian Vulture has a unique appearance and cannot be mistaken for any other vulture. It is small kite-like vulture with naked head and small all-feathered neck. Adult dirty white with black flight feathers; juvenile dark with pale vent and tail. The face is bare, yellow in adult and brown in juvenile. The Egyptian vulture has a very wide range in Africa, southern Europe, and the whole of Middle East, Iran, Afghanistan, Pakistan, India and Nepal. It is found all over India, sometimes very close to human habitation, but its numbers are decreasing.The Egyptian Vulture can be seen walking around villages and traveler camps, looking for carrion, offal, garbage, and human excrement. It opportunistically picks up crickets, frogs and alates of emerging termites. It has a narrow long beck which helps it in tearing off small pieces of meat. The Egyptian Vulture is usually solitary or found in pairs with juveniles. It roosts singly or in small groups, generally on tall trees, but electric towers are frequently used where tall trees are absent. It is mostly resident and seen around its usual haunts throughout the year sometimes undertake short to long distance migration as conditions become unsuitable during winter. It feeds on dead animals but can also kill stranded fish and turtles, and perhaps small prey.It mainly nests on cliffs, rocky projections, brackets of occupied buildings, abandoned forts and ruins, but occasionally on tall trees. A single egg is laid and both parents share incubation and chick-rearing duties.

9. Sarus Crane

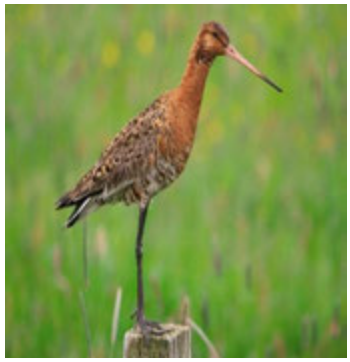
Bird Life International (2013) justifies including Sarus Crane in the vulnerable category as it has suffered a rapid population decline, which is projected to continue, due to widespread reduction in the extent and quality of its wetland habitats, poisoning and pollutants. The Sarus Crane, which stands between 152 and 156 cm, is the tallest flying bird in the world. It is grey overall, with whiter mid-neck mostly naked red head and upper neck, blackish primaries, mostly grey secondaries, and reddish legs that are bright during breeding and pale outside the breeding season. The female is supposed to be slightly smaller, but sometimes this difference is imperceptible. Juvenile has feathered buffish head and upper neck, and duller plumage with brownish feather fringes. The bare red skin of

the adult head and neck is brighter during the breeding season. This skin is rough and covered by papillae and a narrow area around and behind the head is covered with black bristly feathers. The Sarus Crane has a wide distribution range in north and north- west India. Nearly 100 years ago, Sarus was reported from many parts of Maharashtra but it was never a common bird as in north and north-west India. In the 1970s, there were at least 37 pairs of Sarus Crane at Navegaon Bandh reservoir, Gondia districts. near Navegaon National Park, Maharashtra were killed by poisoning.The Sarus uses open wet and dry grasslands, agricultural fields, marshes, and jheels for foraging, roosting, and nesting. Wetlands, even very small ones close to roads and human habitation, are the preferred habitat for

construction of nests. For foraging, Sarus usually uses crop fields to a lesser extent and prefers feeding in wetlands. It is omnivorous, feeding on a variety of roots and tubers as well as invertebrates and amphibians. It has a long breeding season, starting just at the onset of monsoon (July) and extending to October-November. Both parents select the nest sites and help in nest building. Clutch size is usually one or two eggs, but mostly one chick is successfully raised. The juvenile moves with the parents for almost a year, till the next breeding season.

10. Black-tailed Godwit

Although Black-tailed Godwit is widespread and has a large global population, its numbers have declined rapidly in parts of its range owing to changes in agricultural practices. In 2006, Bird Life International classified this species as Near Threatened due to an estimated decline in numbers of around 25% during the preceding 15 years. One of the large waders (40-44 cm) found in India, with a distinctive long bill on a relatively small head, long neck, and long legs. In winter, the colour of its fore body is a pale grey-brown, which becomes a dull pink- chestnut by March-end or April when the birds migrate to their breeding areas. In flight it has a striking white wing bar and rump, and black tail. The female is c. 5% larger than the male. The Black-tailed Godwit is a fairly common winter migrant to the entire subcontinent. It is a winter migrant in India, with the first birds arriving by the last week of August or early September, and becoming well dispersed all over India by late November and December.Sometimes seen solitarily or in small parties of 5- 10 individuals on roadside puddles or village ponds. It feeds on tiny molluscs, crustaceans, worms, and seeds of grass and marsh plants. It is very silent in winter. During the breeding season, it gives high-pitched, nasal, rather strident calls, most common of which is a weeka-weeka-weeka (BirdLife international 2013). According to BirdLife International (2013), it breeds from April to mid-June in loose, semi-colonial groups of up to three pairs per ha. It breeds in lowland wet grasslands, grassy marshland, raised bogs and moors, lake margins and damp grassy depressions in steppes. Secondary habitats such as wet meadow, pasture, damp areas around fish-ponds and sewage farms, and salt-water lagoons are also used.



11. River Tern

River Tern Sterna aurantia has been up listed to Near Threatened category because increasing human disturbance and dam construction projects are expected to drive a moderately rapid population decline over the next three generations (BirdLife International 2013). A medium-sized tern, 38-43 cm long, with dark grey upper parts, white under parts, a forked tail with long flexible streamers, and long pointed wings. Bill yellowish with black tip, legs red, and black cap in breeding plumage. Sexes are similar, but juveniles have a brown head, brown-marked grey upper parts, grey sides to the breast, and white under parts. It inhabits rivers and freshwater lakes, also occurring rarely on estuaries, and it feeds predominantly on insects. Breeding records are known from early March to early May and breeding occurs mainly incolonies in less accessible areas such as islands and sandbanks in rivers. It nests in a scrape on the ground, often on bare rock or sand, and lays three greenish-grey to buff eggs, which are blotched and streaked with brown. River Tern is seen in groups of 10-12 birds.In Maharashtra, it is a common resident found along all the major rivers and wetlands. It breeds in summer on small islands formed in the backwaters of wetlands during the summer months. it breeds gregariously in March, April, or May.

12. Malabar Pied Hornbill

According to BirdLife international (2013), Malabar Pied Hornbill is considered Near sThreatened as it has a moderately small population, and is likely to decline as a result of continuing habitat loss. The Malabar Pied Hornbill is a medium-sized hornbill, c. 92 cm in length. It has mainly black plumage, apart from its white belly, throat patch, tail sides and trailing edge to the wings. The bill is yellow with a large, mainly black casque. Female has white orbital skin, which is black in the male. There is no black on cutting edge of bill in male. The female lacks black at

the rear end of casque. Juveniles lack the casque. This species occurs from southwest West Bengal and Bihar to northern Andhra Pradesh, Western Ghats, mainly along the eastern edge, south of southern Maharashtra.It is locally common but declining in deciduous forests, edges of evergreen forests, plantations, groves, riparian areas, and even villages. It usually feeds and roosts in small to medium-sized groups. it is primarily arboreal and frugivorous, but can be omnivorous, taking fruits, small mammals, birds, small reptiles, and insects. Wagh et al., have recorded 11 fruit species, in the diet of this hornbill in Vidarbha. It breeds in single pairs during March to September.

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SOME FASCINATING FACTS ABOUT BLUE DRAGON

Mr. Ashwin C. Hukare

- Blue dragons, or more properly Glaucus atlanticus, are part of a group of creatures known as nudibranchs or sea slugs.
- They also are known as blue sea slugs, blue angels, and sea swallows. There are a few similar blue dragon species within the Glaucus genus.
- These creatures free float in currents of temperate and tropical ocean waters worldwide, specifically the Atlantic, Pacific, and Indian oceans.
- They Form Groups Called Blue Fleets :- Groups of blue dragons float on the blue-tinted siphonophores they eat, creating formations known as "blue fleets."

GOLDEN PHEASANT

Mr. Sumedh M. Raut

The Golden Pheasant, (Chrysolophus pictus), also known as the 'Chinese Pheasant' is one of the more popular species of pheasant which is native to the mountainous forests of Western and Central China.The Golden Pheasant

was introduced to the United Kingdom around 100 years ago and there are around 101 – 118 mating pairs in the summer. This hardy, gamebird belongs to the order: Galliformes and is a smaller species of pheasant.The Golden Pheasant along with Lady Amherst Pheasant (Chrysolophusamherstiae), make up the group of 'Ruffed Pheasants' named for their ruff which is spread across their face and neck during courtship.

Characteristics

Male and female Golden Pheasants look different in appearance. Males measure 90 – 105 centimetres in length with the tail making up two thirds of the total length. Females are slightly smaller measuring 60 – 80 centimetres in length with the tail making up half of the total length. Their wingspan is around 70 centimetres and they weigh around 630 grams.Male Golden Pheasants can be easily identified by their bright coloring. They have a golden crest tipped with red which extends from the top of their heads, down their necks. They have bright red underparts, dark colored wings and a pale brown, long, barred tail. Their rumps are also golden, upper backs are green and they have bright yellow eyes with a small black pupil. Their face, throat and chin are a rust color and their wattles and orbital skin are yellow. Beak, legs and feet are also yellow.Female Golden Pheasants are less colorful and more duller than males. They have a mottled brown plumage, pale brown face, throat, breast and sides, pale yellow feet and are more slender in appearance.

Habitat

The Golden Pheasant's preferred habitats are dense forests and woodlands and sparse undergrowth.

Diet

Golden Pheasants mainly feed on the ground on grain, invertebrates, berries, grubs and seeds as well as other kinds of vegetation.

Behaviour

Golden Pheasants are very timid birds and will hide in dark, dense forests and woodlands during the day and roost in very high trees during the night. Golden Pheasants often forage on the ground despite their ability to fly, this may be because they are quite clumsy in flight. However, if they are startled, they are capable of taking off in a sudden fast upward motion with a distinctive wing sound.Little is known about their behaviour in the wild as although the males are very colorful birds, they are difficult to spot. The best time to possibly observe a Golden Pheasant is very early in the morning when they may be seen in clearings.Vocalisations include a 'chackchack' sound. Males have a distinctive metallic call during the breeding season. Also, during the males elaborate courtship display, he will spread his neck feathers over his head and beak, like a cape.

Reproduction

Female Golden Pheasants lay around 8 – 12 eggs in April. Incubation time is around 22 – 23 days. The chicks fledge after 12 – 14 days. Males acquire their bright colors during their second year of life but are sexually mature in their first year. The life span of a Golden Pheasant is 5 – 6 years.

HOW THE WORLD'S SQUAREST FISH..... GETS dnuorA

Ms. Naina Karnajekar

- The yellow boxfish is much more agile than it looks . yellow box fish doesn't took selbmin.

Squat and rectangular, it resembles a plastic storage bin with fins. Even its coloring suggests clumsiness — juveniles are hard hat yellow with black spots, as if to say "coming through!"

But on a coral reef, you'll find these cuboid creatures darting in and out of tight spaces, snatching shrimp from crevices and cornering like BMX champs. The combination of their body plan and swimming style "really boggles the mind," said Pim Boute, a doctoral candidate at Wageningen University in the Netherlands.

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MARINE BIOLOGY

Ms. Yamina G. Nakade

Marine biology is the scientific study of the biology of marine life, organisms in the sea.

Given that in biology many phyla, families and genera have some species that live in the sea and others that live on land, marine biology classifies species based on the environment rather than on taxonomy.

A large proportion of all life on Earth lives in the ocean. The exact size of this *large proportion* is unknown, since many ocean species are still to be discovered. The ocean is a complex three-dimensional world covering approximately 71% of the Earth's surface. The habitats studied in marine biology include everything from the tiny layers of surface water in which organisms and abiotic items may be trapped in surface tension between the ocean and atmosphere, to the depths of the oceanic trenches, sometimes 10,000 meters or more beneath the surface of the ocean. Specific habitats include estuaries, coral reefs, kelp forests, seagrass meadows, the surrounds of seamounts and thermal vents, tidepools, muddy, sandy and rocky bottoms, and the open ocean (pelagic) zone, where solid objects are rare and the surface of the water is the only visible boundary. The organisms studied range from microscopic phytoplankton and zooplankton to huge cetaceans (whales) 25–32 meters (82–105 feet) in length. Marine ecology is the study of how marine organisms interact with each other and the environment.

Marine life is a vast resource, providing food, medicine, and raw materials, in addition to helping to support recreation and tourism all over the world. At a fundamental level, marine life

helps determine the very nature of our planet. Marine organisms contribute significantly to the oxygen cycle, and are involved in the regulation of the Earth's climate.Shorelines are in part shaped and protected by marine life, and some marine organisms even help create new land.

Many species are economically important to humans, including both finfish and shellfish. It is also becoming understood that the well-being of marine organisms and other organisms are linked in fundamental ways. The human body of knowledge regarding the relationship between life in the sea and important cycles is rapidly growing, with new discoveries being made nearly every day. These cycles include those of matter (such as the carbon cycle) and of air (such as Earth's respiration, and movement of energy through ecosystems including the ocean). Large areas beneath the ocean surface still remain effectively unexplored.

Marine habitats

Marine habitats can be divided into coastal and open ocean habitats. Coastal habitats are found in the area that extends from the shoreline to the edge of the continental shelf. Most marine life is found in coastal habitats, even though the shelf area occupies only seven percent of the total ocean area. Open ocean habitats are found in the deep ocean beyond the edge of the continental shelf. Alternatively, marine habitats can be divided into pelagic and demersal habitats. Pelagic habitats are found near the surface or in the open water column, away from the bottom of the ocean and affected by ocean currents, while demersal habitats are near or on the bottom. Marine habitats can be modified by their inhabitants. Some marine organisms, like corals, kelp and sea grasses, are ecosystem engineers which reshape the marine environment to the point where they create further habitat for other organisms.

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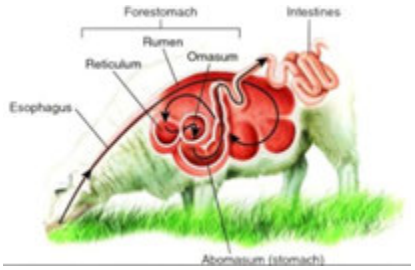
SOME AMAZING FACTS ABOUT ANIMALS AND BIRDS !!!

Mr. Aman V. Parihar

1. The regal horned lizard has a gross way of repelling attackers. They squirt blood out of their eyes!

2. Sheep have four stomachs.



3. Snakes can see with their eyes closed

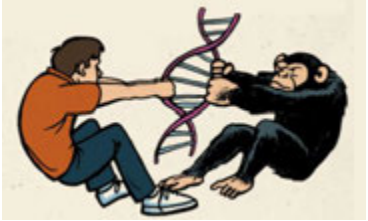
4. Blue whales make the loudest sound of any animal.

5. Both male and female pigeons. produce milk for their babies.

6. The giant tortoise of the Galapagos Islands weighs as much as a brown bear.

7. An eagle's vision is four times sharper than a human's.

8. Humans share 98.8% of chimpanzee DNA.



9. Vampire bats have such sharp teeth that you may not feel them bite you.

10. Starfish have no brain and no blood. And they aren't even fish.

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THE ANTERNET

Ms. Aliya Sheikh

1. There are about 15,000 species of ants, including diligent harvester ants that gather seeds and leaves, aggressive fire ants that make a drumming sound, leafcutter ants which clip and carry leaves in their mouths to cultivate subterranean vegetation to weaver ants who build nests, held together by secreted silk .
2. Ants communicate chemically and make decisions through observation - for instance, not all harvester ants forage for food. Each harvester ant decides to go out based on the rate at which it sees ants coming

in with food - the faster this rate, the more harvester ants venture out, which means the nest makes intelligent decisions, maximising resource usage.

3. Ants live in nests underground, in ground- level mounds or on trees. They collectively build their habitations based on smart choices, such as a lack of predators, the availability of food and the traffic around.

Most people don't really notice ants. What drewy out or esearch their world?

.....Well, although ants are small, their impact on the environment is huge and they accomplish incredibly complex tasks through collaboration. I always loved insects and watching the behaviour of cooperating ants fascinated me since I was young.

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FIREFLIES LIGHT (HOW AND WHY THEY LIGHT UP)

Ms. Pallavi V. Khotele

Fireflies produce a chemical reaction inside their bodies that allows them to light up this types of light production is called bioluminescence. The method by which fireflies product light is perhaps the best known examples bioluminescence. When oxygen combine with calcium adenosine triphosphate (ATP) and the chemical luciferin in the presents of luciferase, a bioluminescent enzymes, light is produced. Unlike a light bulb, which produced a lot of heat in addition to light a firefly's light is "cold light" without a lot of energy being lost as heat this is necessary because if a firefly's light-producing organ got as hot as a light bulb, the firefly would not survive the experience.

A firefly's controls the beginning and end of chemical reaction and thus the start and stop of its light emission by adding oxygen to the other chemicals needed to producing light tjis happen in the organ insect's light organ when oxygen in available the light organ lights up and when it is not available light goes out insects do not have lungs but instead transport oxygen form outside the body to the interior cells within through a complex series of successively smaller tubes known as tracheales. For a long time it was a mystery as to how some firefly species manage such a higher flash rate considering the relatively slow speed of the muscles that control oxygen transport. Researchers fairly recently learnt that nitric oxide gas (the same gas that is produced by taking the drugs Viagra plays a critical role firefly flash control. In short, when the firefly light is off no nitric oxide is being in produced, in this situation oxygen that enters the light organ is bound to the surface of cells energy producing organelles, called the Mitochondria and their by not available for transport further within the light organ. The presents of nitric oxide which bind to the mitochondria, allows oxygen to flow onto the lights organ where its combines with the other chemicals needed to product the bioluminescent reaction. Because nitric oxide breaks down very quickly, as soon aa the chemical is not longer being produced, the oxygen molecules are again trapped by the mitochondria and are not available for the production of light. Fireflies appeare to light a for a Verity's reason the larvae product sort glow and primarily active at night even through many species are subterranean are semiaquatic. Fireflies produce defensive steroids in their bodies that mark them unpalatable to predators. Larvae use their glows as warning display to communicates their distastefulness. As adult many fireflies have flash partner unique to their species and use them to identified other members of their species as well as to discriminate between members of the opposite sex. Several studies have so that female fireflies closed mates depending upon specific male flash rates. As well as increate flash intensity, have been so to be more attractive to the females into different fireflys species. The adult fireflies of some species or not luminous at all however and instead use pheromones to locate mates the use of pheromones as a asexual signal appears to be the ancestral conditions in fireflies with the use of luminous sexual signals as beginning more recent developments. There are species that employed both Pheromone components in their matting system their species appwared to be evolutionarily intermediate between the pheromone only fireflies qnd flash only fireflies.

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KOMODO DRAGON

Ms. Dhanashree Borkar

The Komodo Dragon also known as the Komodo Monitor , Is a member of the monitor lizard family Varanidae that is endemic to the Indonesian islands of Komodo , Rinca , Flores and Gili Motang . It is the largest extant species of lizard , growing to a maximum length of 3 m (9.8 ft) and weighing upto 70 Kg

On The Hunt :-

- Komodo Dragons hunt and ambush prey including invertebrates , birds , and mammals . They are group behaviour in hunting is exceptional in the reptile world .
- The diet of Komodo Dragons mainly consists of Javan rusa , though they also it considerable amounts of carrion . They can also also occasionally attack humans.
- They can wait for the right time to attack their prey . The lizard averages just one meal in month . When it does it , The Dragon eats a large amount.

A Dragon's Life :-

Komodo Dragons are not soacial animals. They live most of there lives alone and away from each other. However, They do come together when it is time to mate. Most female Komodo Dragons mates when they are about nine years old. Males are ready to mate when they are Ten years old.

Most mating takes place in summer. Mating begins between May and August, The eggs are laid in September , as many as 20 eggs are deposited at a time abandoned megapode nest or in a self-dug nesting hole. The eggs are incubated for seven to eight months, hatching in April, When insects are most plentiful. They take eight to nine years to mature and are estimated to live upto 30 years.

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"GOLDEN RICE"

Ms. Yamina Bangare

Golden Rice is the name of a rice that has been genetically engineered (genetically modified or GM) to produce beta- carotene, which the body can convert into vitamin A. This beta-carotene gives the rice grains the yellowish colour that inspired its name.

Golden Rice is being developed by the International Rice Research Institute (RRI), a research and educational organization based in the Philippines, along with various national partners in other countries.

Vitamin A Deficiency

IRRI and other proponents of Golden Rice claim that it will be an important intervention to address vitamin A deficiency, or VAD. VAD is a serious problem in communities facing malnutrition and food insecurity. Its impacts are particularly severe for children and, if not dealt with, VAD can lead to

blindness, and in severe cases, even death. The UN World Health Organization (WHO) estimates that 250 million preschool-age children in the world are deficient in vitamin A. Approximately 250,000 to 500,000 of these children become blind every year.! VAD can be addressed through a combination of strategies. Including dietary diversification, food fortification and supplementation. According to the WHO, supplementation programs around the world have averted approximately 1.25 million deaths since 1998, and have reduced the risk of exophthalmia by approximately 90% and mortality by approximately 23-30% in young children.3

Regulatory Status of Golden Rice

There is no GM rice on the market anywhere in the world. Golden Rice is designed for use in the Philippines and Bangladesh but these countries have yet to approve it. Golden Rice has, however, been approved as safe for human consumption in four countries that will not be producing or consuming it: Canada, the US, Australia and New Zealand. No country has yet approved the rice for cultivation or assessed its potential in combatting VAD.

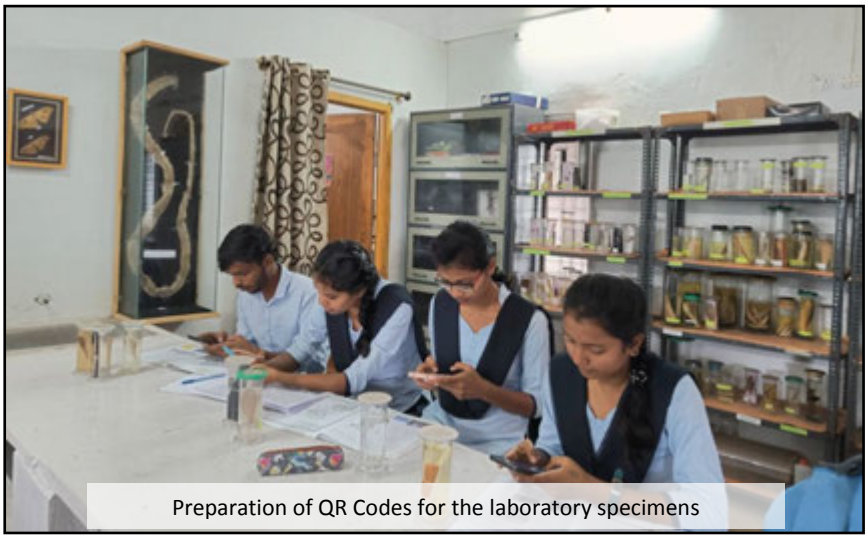
The Philippines Rice Research Institute (PhilRice) conducted field trials on Golden Rice in 2015 and in 2016. In February 2017, PhilRice and IRRI applied to the Philippines' Department of Agriculture-Bureau of Plant Industry for approval of Golden Rice for food and feed.

CLASSROOM ACTIVITIES

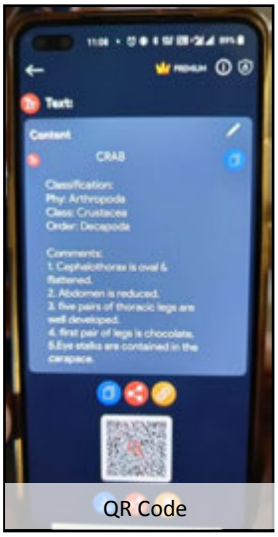
Dissection of Endocrine glands of fish, *Clarias gariepinus*

Specimens study using QR codes

Micrototechnique demonstration to students



Preparation of QR Codes for the laboratory specimens



QR Code

Specimens study using QR codes

OTHER ACTIVITIES

Celebration in Zoology laboratory

JT Point Navegaonbandh during Nature camp at 12.30 am

Tasar silk weaving

National Conference (NCBWC-23) registration counter

National Conference (NCBWC-23) photo with guests

National Conference (NCBWC-23) organizers team

MERITORIUS STUDENT

Miss. Savita R. Sonwane

(Topper in B. Sc Semester VI in Zoology)

Congratulations..!!

Felicitation of Ms. Savita Sonwane with her parent

ZOOLOGICAL SOCIETY

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ehitavada.com

Zoological Society constituted at S S Jaiswal College

Guests present at the programme.

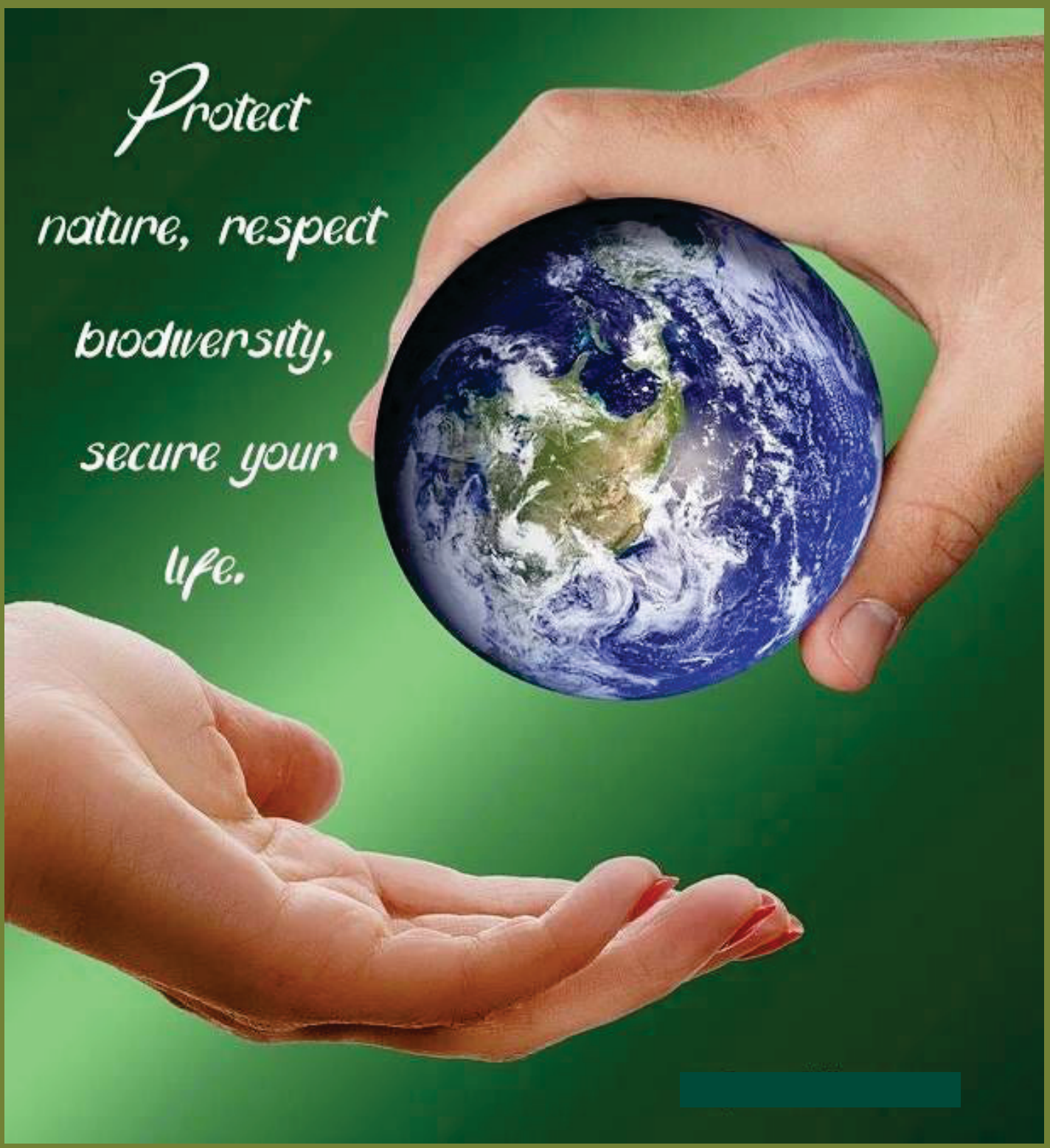
THE installation of the Zoological Society of Shivprasad Sadanand Jaiswal College, Arjuni Morgaon for the session 2021-22 was held in a programme organised the other day. Prof. Ishwar Mohurley, Principal presided over and Manish Rajankar, Director Foundation for Economic and Ecological Development (FEED) was the chief guest. Dr. K.L. Sibi, IQAC Coordinator, Dr. Sharad Deshmukh, HOD Department of Microbiology, Dr. Gopal Pulwal, HOD Department of Zoology, Dr Manoj Bangadkar, Prof. Rupchand Dongarwar were also present.

The objective of zoological society is to develop scientific temperament among the students and to inculcate basic knowledge of Zoology, environment through their participation. Prof Mohurley announced the names of the office bearers of Zoological Society for the session 2021-22 and congratulated them.

Prof Mohurley in his Presidential talk said that every student has an inherent talent, the only thing is that you have to keep yourself in a positive frame of mind to achieve your goals. A Memorandum of Understanding (MOU) was also signed with the exchange of documents between Principal Prof. Ishwar Mohurley and Manish Rajankar, Director Foundation For Economic and Ecological Development. Rajankar delivered a guest lecture on the topic 'Our area and Zoology...need of research in the case of mud-gujart tanks'. About 120 students from the science stream participated in the programme. The event was conducted by Pranali Meghare and Savita Sonwane proposed a vote of thanks. Dr Manoj Bangadkar, Prof Rupchand Dongarwar, all the Students and office-bearers of Society took efforts for the success of the programme.

SESSION 2022-23

Students of B. Sc. Zoology, Semester VI, Session 2022-23 with Principal Dr. Ishwar S. Mohurley, Dr. Gopal T. Paliwal, Dr. Sudhir Bhandarkar, Dr. Manoj K. Bangadkar and Mr. Rupchand Y. Dingarwar


Protect
nature, respect
biodiversity,
secure your
life.