

Field Work Undertaken in last 4 years

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1. Evaluating the butterfly diversity in and around P.G. Department of Biosciences: Mr. Mayur Varia

Invasion and occurrence of new butterfly species could be due to deforestation in a nearby area, loss of natural habitats because of residential, commercial and agricultural developments. Comparisons were made with earlier records and it was found that a total of nineteen new species were found. With increasing faunal diversity in Department premises in last decade could have played an important positively correlated role with butterfly and avifaunal diversities.

An emphasis was made even on host and plant interactions with respect to larval and adult food habits. Besides, nectar properties need to be analyzed in order to understand the preference of specific nectar plants by butterflies. Total of 77 species of butterflies were recorded in and around Anand city from five different families- Papilionidae (5 spp), Hesperidae (13 spp), Pieridae (15 spp), Nymphalidae (16 spp) and the largest amongst all Lycaenidae (28 spp). We are in the process to understand the food habits of more and more butterflies and thus in future we may attempt to plant butterfly-attractant plants in and around Department premises. More efforts may be required to arrange butterfly walks and interactions with school children as well as local community for enhancing diversity of tiny beautiful jewels around us.

2. An investigation on Water quality, floral and faunal diversity at Pariyej Lake: Miss. Rinku A. Bhati

Pariyej is widely known for man-made irrigation reservoir of Central Gujarat. Several researchers carry out short- and long-term surveys on floral and faunal components of wetlands including Pariyej. Present study (December- 2017 to April-2018) mainly focused on interactions of physicochemical properties of water along with plankton, floral and faunal diversities and to understand the food-chain of aquatic ecosystem.

Biological and chemical oxygen demands are well within the permissible limits that may favor the aquatic organisms' growth, development and sustenance. Ironically, diatoms and rotifers are found to be higher indicating elevated pollutants in the wetland.

Additionally, winter months gain the attention of nearby area tourists due to significantly high populations of migratory and non-migratory birds. Higher avifaunal density could be due to heavy biomass of fish, planktons and algal blooms that are preferable by wader and duck species. Current mesotrophic condition of wetland requires immediate attention for increasing the conservation measures and spreading the awareness to convert it into oligotrophic in the days to come.

3. Exploration of Spider diversity in and around P. G. Department of Biosciences: Mr. Jigar Patel

Arachnology research in India is picking up the pace in last few years. It is believed that spiders have witnessed all five mass extinctions and evolved significantly. Spiders are well dispersed across the continents except Antarctica and they are considered prey species yet their role in ecosystem regulation is very significant. A short- term survey was undertaken in the P.G. Department of Biosciences during December, 2018- April, 2019. Department premises being very densely green serves as the ideal habitat for many spider species. Diurnal and nocturnal observations were carried out and a checklist was prepared comprising of more than 65 species belonging to 18 different families. Jumping spiders represents the highest in number amongst the other species. Different types of behaviors- feeding, web building, cannibalism and parental care were documented and recorded. Further studies are in progress to understand the significant role of spiders as biological tool for cleanliness and overall regulation of ecological balance.

4. Avifaunal population at Department of Biosciences Campus: Miss. Deepali Dave

Faunal species are ecological regulators as they help maintain the balance in food pyramid. In last few years, several attempts have been made to enrich the floral diversity of Department of Biosciences and in turn it also helps in attracting various faunal components also. Abundance of butterflies, beetles, bees, bugs and ants in the premises are the key factor for the gradual increase in avian diversity in last decade or so. We have observed both migratory and non-migratory birds often visit and many prefer to build their nests and even occupy as major roosting sites also.

A short-term survey was conducted during December- 2018 to April-2019 and diurnal observations revealed presence of 65 local and 13 migratory bird species. Results include fascinating and rare sighting of Jerdon's Leaf Bird for last consecutive 4 years. From the conservation point of view and according to IUCN red list- two Avian species from near threatened category were also documented. Interactions and correlation studies are carried out in order to understand the food preferences of several birds, influence of urbanization and to correlate with human interactions needs to be studied for better perspectives.

5. Ecological study of *Saara hardwickii* in Central Gujarat: Akshita G Patel

Saara hardwickii (Indian spiny tailed lizard, Family: Agamidae), locally known as ‘Sandha/Sandho’. This genus mainly includes three species worldwide - *Saara hardwickii*, *Saara loricata* and *Saara asmussi*. The *S. hardwickii* is widely distributed in many countries including India, Pakistan and Afghanistan. Adult animals are largely herbivores whereas subadult feeds on insects and vegetation both. There are several risk factors such as some orthodox belief system of aphrodisiac and antiarthritic agent and for the edible usage by some tribal communities. Besides, loss of their original habitat, industrialization, urbanization and agricultural expansion serve as anthropogenic pressures for this species.

The present study was carried out at Vadla village of Surendranagar district. Population of spiny-tailed-lizards was recorded by Quadrante method in open scrub land reserved by Forest Department for cattle grazing area (‘Gauchar’) with major part of land covered by *Prosopis juliflora* and *Calotropis procera*. This species is basically diurnal, lives in colonies and are solitary burrow dweller. Population density was determined by the active and inactive burrows and their sightings are highly in accordance with prevailing temperature and humidity conditions. In one-kilometer area of the current study, 75 lizards were spotted during October, 2019 to March, 2020. Different activity patterns such as feeding, hiding swiftly even with small disturbance, basking, chasing, resting etc., were noted and photographed. Lizards reside in the burrows with semicircular openings and after basking they seal the burrows regularly to avoid the predators. Further, some community awareness campaigns were also organized in and around the study site and questionnaire were prepared to obtain the understanding and awareness in local community.

6. Population Estimation and Different Behavior of Indian Grey Hornbill in Vallabh Vidyanagar: Mr. Abhishek Nena

The present study was aimed at estimating population and observing natural behaviors of Indian grey hornbill in Vallabh Vidyanagar. Four months survey revealed that population of IGHB is highly dependent on type of area, high large tree density and canopy cover area, availability of breeding habitat and availability of food. Different maintenance behaviors such as preening, scratching, stretching and beak cleaning were noted. Courtship display was also documented wherein a male was found offering different food materials including figs, small insects, larva and other food materials to a female. All the IGHB nests were found in live trees that are tall with large girth offering them the defence especially in breeding season. In 2018, around 68 large trees were removed for road widening from Sardar Patel statue to Janta chowkdi area.

This study provides the basic data of Indian grey hornbill that enables us to understand the behavioural aspects and also help to prepare management plan for conservation of Indian grey hornbill in future. There may be much secrets and interesting dimensions about courtship rituals and breeding behavior of Indian grey hornbill that can be further worked upon.

7. Density Assessment of Totally Urbanized Feral Pigeons and their Relationship with Humans: Mr. Umang Sutariya

Pigeons get adapted very quickly with increasing urbanization and tend to explore any type of available food resources. Pigeons suburbanized and rely majorly on humans for their daily food requirements. Current study chiefly focused on the aptitude and influence of pigeon feeders in determining pigeon density as well as population distribution. Pigeon flock generally prefer the public feeding sites compared to casual feeders who may tend to feed smaller amounts with variable time interval. Distribution of pigeon is proportional to increased human density which may correspond to the availability of food varieties provided in the cities. Additionally, site loyalty was a characteristic feature at all nine spots and morning visits were preferred due to increased food resources available locally with minimum energy investments.

Human attitude was found to be correlatable with pigeon habit and/or ritual and many of them had a positive view towards pigeons. In spite of the fact of increased pigeon density may be hazardous especially for immunosuppressive individuals. It clearly indicates that as pigeons got acclimatized with urbanization, humans also developed certain degree of tolerance and empathy. This has created a dilemma about continuing pigeon feeding as a religious ritual with an exponential population growth as natural/ accidental death is the only limiting factor. Pigeon species needs to be understood more diligently as they have turned out be multidimensional nuisance agent. It also relies on complex dynamics of ecological, behavioral and physiological attributes of pigeons with socio-economic-psychological human influences. Further, long term studies are needed to establish a greater degree of correlation between increasing pigeon population, threat to other bird species for the purpose of foraging and human health concerns.

8. Short term study on Migratory Patterns of Waterfowls in Pariyej Wetland- Mr. Saurabh Bhuria

The study analyzed the influence of various factor in the occurrence and distribution of waterfowl communities. Amongst many physicochemical and ecological parameters, temperature fluctuations play a vital role in faunal diversity at Pariyej wetland. Floral diversity and avifaunal diversity are generally negatively correlated. Wetlands provide multiple and substantial ecological benefits to human society. Waterfowl are part of Indian natural heritage and winter months are more suitable for their migration. Many factors may affect migration including deforestation, conservation of wetlands into agriculture or non-agricultural purposes. With higher fluctuations in temperature waterfowls may find difficulty in obtaining food resources. At 23°C temperature, maximum number (thirteen species) of waterfowls were observed. In last few years, there has been a tremendous change in the climatic conditions, altered vegetation and higher number of visitors especially in winter months could be few of the reasons for dramatic decrease was observed in terms of diversity and density of waterfowls.