# POLLUTION – THE BURNING NIGHTMARE TO FAUNAL DIVERSITY (ASSESSMENT STUDY)

Bratati Dutta (M.Sc. SEM-2,University of Calcutta) & Mandira Ghosh (M.Sc. SEM-2, Lady Brabourne College)

**INTRODUCTION** : All the forms of pollution(air, water, soil) pose a serious threat to biodiversity, particularly to nutrient loading, primarily of nitrogen and phosphorus leading to biodiversity loss and ecosystem dysfunctioning. Chemical use and exposure patterns have drastically enhanced through the last few decades . As a consequence, some species have dispersed to higher altitude and latitude and some are facing extinction .

**WHY WE CHOOSE INSECTS?** Insects occupy 2/3rd portion of the terrestrial habitat, that is critical to a healthy ecosystem.

* Pollinators like bees, flies, moths, butterflies are crucial for food production * They ensure long time survival of wide floral diversity * They are food for diverse vertebrate group like frogs, reptiles, birds.
* They help decay organic matter persisting to healthy soils via recycling. * The biggest assessment of global insect abundances show almost 25% decline of insect population in last 30 years [1]

**MAJOR THREATS** : Climate change | Insecticides, pesticides | High N02 level | Organic pollution | Oil, polychlorinated biphenyl's | Heavy metal pollution.

## STUDY 1 : ODONATA

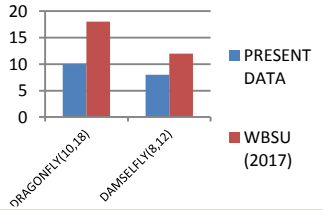
**WHY CHOOSE ODONATA?** 1)ancient order of insect 2)indicator of aquatic and terrestrial habitat 3)keeps under control the mosquitoes and blood sucking insects.

**STUDY AREA** - Pond bank of Dhitara, Bhradeswar;
Latitude: 22°49'28.16" N Longitude : 88°20'18.28" E

**METHODOLOGY** - Random observation;

**STUDY TIME** - throughout the day,2018-2019 (rainy season)

Graph [Sumit K Saha, Odonata Diversity –a checklist, 2017]




**DISCUSSION**

According to global report, 37% of Odonata declined in past decade[1,4], it is the first order to be regarded in IUCN Red list of threatened species[2,3]; annual species decline 1%[1]

**FACTORS AFFECTING POPULATION IN STUDY AREA**

1)Insecticide and pesticides from adjacent agricultural lands washed off and pollute the waterbodies.
2) Nearby sewage water mixes to water body.
3) Elevating temperature results decreasing wings size with higher load declining dispersal ability

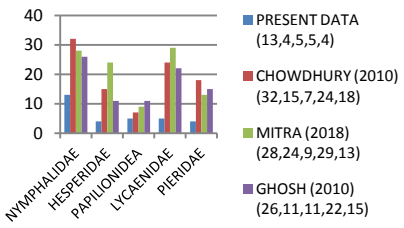
## STUDY 2 : LEPIDOPTERA

**WHY CHOOSE LEPIDOPTERA?** 1)Short life cycles 2) React quickly to environmental changes 3)Well documented 4) Occur in all main terrestrial habitats.

**STUDY AREA** - Chintamani Kar Bird Sanctuary (0.1km2)
Latitude 22°25'44.4"N and Longitude 88°24'06.7"E

**METHODOLOGY** - Pollard Walk Method (Pollard 1977; Pollard and Yates 1993) **STUDY TIME** - observed throughout the day in monsoon and post monsoon season in 2018-19.

GRAPH – [5,6,7]




**FACTORS AFFECTING POPULATION**

1)Habitat loss
2)widespread use of insecticides
3)Climatic changes
4)Urbanization

**DISCUSSION-** The no. of species in different families was lesser in our studies. But unfortunately conclusions cannot be drawn as the study area and seasons are not clear for the earlier studies. However, decline in their population can cause major risk to the environment and food security to humans as they are responsible for pollination.

## STUDY 3 : BIRDS

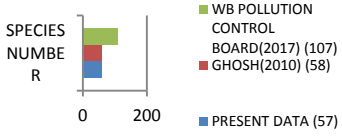
**WHY CHOOSE BIRDS?** 1)Well documented 2) They eat a variety of foods and ground have a broad range of niche requirements. 3) sensitive to changes in the environment .

**STUDY AREA** -Rabindra Sarovar of national importance is second largest water body in Kolkata; situated in the southern part of the city (22°30′.30″ -22°30′.42″ N, 88°21′-88°22′ E).

**METHODOLOGY** -Point Count Method (PCM).

**STUDY TIME** – throughout the day all year 2018-19.

GRAPH –[7,8]




**FACTORS AFFECTING POPULATION**

1)Anthropogenic activities
2)Pesticides, insecticides
3)Climate changes
4)Urbanization

**DISCUSSION -** We compared the checklist species number. But unfortunately conclusions cannot be drawn as the study area and seasons are not clear for the earlier studies. However, decline in their population hint at serious issues including plant extinctions, the loss of agricultural pest control, and the spread of disease. Also People from adjoining areas bathe as well as wash their clothes in this lake. The detergent has detrimental effect on the aquatic flora and fauna.

**CONCLUSION** - It's clearly visible that indicator species are disappearing or limiting in number. Organic and air pollution has alarming effect on mayflies, stoneflies, pollinator bees, butterflies and most herbivorous insects. Diverse group (amphibia,reptiles and birds are facing tremendous difficulties in feeding as the food chain is getting disrupted. Short life span exposes them to less favorable condition reducing chances of reproduction with a higher mortality rate. Much of the pollution is caused as a consequence of anthropogenic activities. Though awareness being created, the environment is getting clearer with time but it is still not well established. If we continue to pollute our surroundings devastating consequences will be in our hand soon as we are aware of the direct effects of climate change on the physiology of many organisms including man.

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