



3.3.1 Number of research papers published per teacher in the Journals notified on UGC CARE list during the last five years

Title of paper	Name of the author/s	Department of the teacher	Name of journal	Calendar Year of publication	SSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object		
						Link to website of the Journal	Link to article / paper / abstract of the article	Is it listed in UGC Care list
Aquatic Insect biodiversity and water quality parametres of the Bekarbandh Pond of Dhanbad District.	Dr. Amita Mishra	Zoology	Proceedings of the zoological society of India	2018	0972-6683	<a href="https://link.springer.com/journal/12595">https://link.springer.com/journal/12595</a>	Article has been published in off line mode	Yes
Impact of physico-chemical factors of the soil on the population dynamics of beetles of the Dhanbad District	Dr. Amita Mishra	Zoology	Proceedings of the zoological society of India	2018	0972-6683	<a href="https://link.springer.com/journal/12595">https://link.springer.com/journal/12595</a>	Article has been published in off line mode	Yes
Study of zooplanktons of the maithan dam of the Dhanbad district Jharkhand.	Dr. Amita Mishra	Zoology	Proceedings of the zoological society of India	2018	0972-6683	<a href="https://link.springer.com/journal/12595">https://link.springer.com/journal/12595</a>	Article has been published in off line mode	Yes
The Study of feedings habits of collembola and there ecological habited	Dr. Amita Mishra	Zoology	Proceedings of the zoological society of India	2019	0972-6683	<a href="https://link.springer.com/journal/12595">https://link.springer.com/journal/12595</a>	Article has been published in off line mode	Yes
Study of the effect of metal conamination on the population of the beetle , pterostichusoblongopunctatusf	Dr. Amita Mishra	Zoology	Proceedings of the zoological society of India	2019	0972-6683	<a href="https://link.springer.com/journal/12595">https://link.springer.com/journal/12595</a>	Article has been published in off line mode	Yes
Study of the nutrition and feeding behaviour of the hemipterans on less preferred plant food sources nassrating 4.4.2	Dr. Amita Mishra	Zoology	Proceedings of the zoological society of India	2019	0972-6683	<a href="https://link.springer.com/journal/12595">https://link.springer.com/journal/12595</a>	Article has been published in off line mode	Yes

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# PROCEEDINGS OF THE ZOOLOGICAL SOCIETY OF INDIA

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## AQUATIC INSECT BIODIVERSITY AND WATER QUALITY PARAMETERS OF THE BEKARBANDH POND OF DHANBAD DISTRICT. (JHARKHAND)

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### ABSTRACT

*Biodiversity of aquatic insect and physico-chemical water quality parameters in the Bekarbandh pond was assessed during June 2016 to May 2017. Seven sampling stations, each 100m long were established. Three replicates of samplings by aquatic D frame net were used at sampling sites. A total of 4,257 individual of aquatic insect were collected during one year. 6 orders & 12 families were recorded in this study. The family Hydropsychidae and Chironomidae were the most abundant of aquatic insects that was found in the pond water. The CCA revealed the family Mesoveliidae and Chironomidae were correlated with alkalinity in the pond water, whereas dissolved oxygen was correlated with family Baetidae, Coenagrionidae, Hydrophilidae and Helotrepidae. Signs of increasing water quality deterioration were evident in the result of the physico-chemical analyses.*

**Key words :-** Aquatic insect, Biodiversity and water quality.

### INTRODUCTION

Water is one of man's important natural resources. Most living organisms in this biosphere can not survive for long periods without water. As the amount of freshwater on the earth is limited, the importance of surface water quality assessment should be considered. Because of a concern for human health and the habitat of aquatic life, global awareness in the maintenance of a clean water world, many people have come to realize the importance of clean surface water to a nation's economy. Most inland freshwater ecosystems are being increasingly polluted by run-off from agricultural fields, degraded land, and disposal of domestic sewage and industrial effluents.

Freshwater aquatic insect inhabit river and stream beds, lakes & reservoirs and are associated with various types of substrates such as mineral sediments, detritus, macrophytes and filamentous algae. (Rosenberg and Resh 1993). They are essential elements in lentic and lotic trophic webs, particularly in the energy flow and nutrient cycling. (Whiles and Wallace 1997). They are also important food resources for fish (Wallace and Webster 1996) and some insectivorous birds. (Merritt and Cummin 1996). The distribution of aquatic organism is the result of interaction among their ecological role, the physical conditions that characterize the habitat and food availability. (Merritt and Cummin 1996). Thus, the community structure of aquatic insect depends on a number of factors, such as water quality, type of substrate, particle size of sediments, water flow, sediment organic matter availability, oxygen concentration as well as environmental conditions surrounding the water course. (Ward Holmes and JOSÉ 1995), (Buss Baptista Nessimain and Eglar 2004). Because they reflect environmental changes, aquatic insects are often used as indicators of the effects of human activity on water system and provide information on habitat and water quality. (Woodcock and Huryn 2007). The organic enrichment of water caused by both domestic and industrial effluents is a common anthropogenic impact on urban water courses. This kind of pollution changes the

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# IMPACT OF PHYSICO-CHEMICAL FACTORS OF THE SOIL ON THE POPULATION DYNAMICS OF BEETLES OF THE DHANBAD DISTRICT (JHARKHAND).

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## ABSTRACT

The terrestrial insects are exposed to extreme variations in temperature and moisture than their counterparts in the aquatic ecosystem. The Beetles have certain requirements having specific physiological significance. Being cold blooded, two main characteristics of their population viz. death rate and birth rate are very much dependent on the physico-chemical factors of the soil. Beetle infestations have increased in magnitude and severity as a result of warming temperatures.

**Key words:-** Terrestrial insect, Cold blooded.

## INTRODUCTION

The beetles are absolutely unique and a paradox of a kind among the insect orders. With the expansion of the biological sciences Coleopterans were more recognized as the predators of many noxious pests which caused colossal damage to human economy. Despite a good deal of literature available on the ecology of Coleopterans mainly cursorial and soil dwelling form in different habitats, the Indian Coleopterans have failed to receive the attention which these curious insects deserve. The main aim of the present study is to study the population dynamics of the cursorial Coleopterans at various sites of Dhanbad city, by a widely accepted sampling device, of Pitfall traps.

## MATERIALS & METHODS

**[A] Methods of Sampling:-** For the sampling of the beetle fauna following devices were used.

1. Pitfall traps:- to collect cursorial ground dwelling larger Coleopterans.
2. Tullgren's funnel :- to collect smaller forms both adult and grubs living mostly in the litters.

**[B] Analysis of Edaphic factors :-** various edaphic factors such as soil temperature, soil moisture, pH, organic matter, nitrogen, phosphorous and potassium contents were analyzed by standard laboratory methods. Jackson, 1973 and Jain and Rena, 2015.3

1. **Soil temperature :-** soil temperature was measured by directly inserting the soil thermometer into the soil.
2. **Soil moisture :-** the absolute water content of the soil was determined by the method described by Dowdeswell (1959). Collected soil sample was kept in a tray for 24 hours for air drying. It was then crushed in mortar and pestle and passed through sieve ( mesh size 83) to obtain "fine earth". 10 gm of this fine earth was kept in a hot air oven at 105°C for one hour. It was weighed after cooling in a dessicator. The loss in weight expressed in percentage represented the moisture content of the soil.
3. **pH :-** pH of the soil sample is determined with the help of electric pH meter. (Singh and Sinha, 2015)

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## STUDY OF ZOOPLANKTONS OF THE MAITHAN DAM OF THE DHANBAD DISTRICT, JHARKHAND.

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### ABSTRACT

In the Maithan dam, the Zooplanktons were represented by the Crustaceae( Cladocera, Copepoda and Ostracoda ), Rotifera & Protozoa. The Rotifera is the dominating group followed by Copepoda and then Cladocera. The invertebrates which live on, in or near the substratum of the dam water include representatives of almost every taxonomical group that occurs in fresh water. Rotifera was the abundant group representing 62% of total species, followed by Copepoda 28% and Cladocera 8%. The dominant Zooplanktons recorded in the dam were *Filinia sp.*, *Branchionus sp.*, *Asplanchna sp.* Abundance of these species indicates that the dam has become eutrophic.

**Key words :** Invertebrates, Substratum, Taxonomical group, Species, Eutrophic.

### INTRODUCTION

Zooplanktons are myriads of diverse floating and drifting animals with limited power of locomotion. Majority of them are microscopic, unicellular or multicellular forms with size ranging from a few microns to a millimeter or more. They feed on phytoplankton and facilitate the conversion of plant material into animal tissue and in turn constitute the basic food for higher animals including fishes, particularly their larvae. The Zooplanktons play an important role to study the faunal bio-diversity of aquatic ecosystem. They are utilized to assess energy transfer at secondary trophic level. The study of the Zooplanktons have been done by Mandal, 2002, Kumar 2003, Singh et. al 2015; Kumar and Mandal, 2014 & 2015 from various fresh water bodies. But inspite of the fact that zooplanktons are the chief source of food for many fishes & all aquatic insects, less information is available on the zooplankton community of the Maithan dam. The aim of the present study is to investigate the various types of zooplanktons of the dam water.

### MATERIALS & METHODS

For the collection of Zooplanktons, plankton nets made up of bolting silk net cloth no.20 was used. The collection was done by simply filtering about 60-70 litres of the surface water through the plankton nets. The samples thus obtained were preserved in 5% formalin for further study and identification. The identification was done through standard literatures available of Sinha et.al 2015.

### RESULT & DISCUSSION

The Maithan dam is a famous picnic spot. People enjoy boating also. The dam water is also used for supplying drinking water to the city dwellers. The dam is also the habitat of many exotic fishes. The systematic account of various zooplanktons is given in table no.1. The Rotifers were the most rich species group in the Maithan dam followed by Copepoda & Cladocerans. The present study is in agreement with other studies, Barrabin 2000; Saler 2004, that the rotifers are the most dominant group in freshwater ecosystems. Rotifer composition can be used as biological indicator & water quality assessment as they respond to the changes of environmental variables, Sladecek 1983, According to Aboul-Ezz et.al.1996,

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# THE STUDY OF FEEDING HABITS OF COLLEMBOLA AND THEIR ECOLOGICAL HABITAT.

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## ABSTRACT

The present study is conducted to find out the changes in the feeding habits of springtails, related to their ecological habitat. In this study the results and the observations are compared of the diet of Collembola in three different ecological system viz. (1) tropical forest in Topchachi, Dhanbad. (2) two crop fields in Bhuda, Dhanbad and (3) the epiphytic plant, Tillandsia violacea from a temperate forest in Panchet Dam, Dhanbad. Specimens collected from the crop fields have vegetable matter and fungal conidia in their gut contents. The species associated with the epiphytic plants, showed a distinct type of feeding. In such species, the debris of algae, diatoms and bacteria were found. During the dry season, there were fragments of Prostigmata and Astigmata (Acaridae), mites in the gut of Ptenothrix marmorata. In Seirapurpurea, both in rainy season and dry season, there were fragments of exuvia of springtails and also some parasitic nematodes. The presence of mites in the digestive tract of Collembola from the epiphytic bromeliads could probably be explained by the fact that during the dry season, the populations of Astigmata and Prostigmata are enormous and constitute prey for the spring tails. It is also probable that their ingestion is accidental, or even that they are forced to diversify their diet when the conditions of the ecological niche change.

**Key Words** :-Collembola, Epiphytes, Parasitic.

## INTRODUCTION

Collembola represents one of the most abundant groups in the soil; and one of their major contribution to the soils is the regulation of the fungal populations (Warnock et.al 1982), affecting their dispersion, and also that of bacteria, to colonize new substrata (Visser et.al.1981). They also help in establishing relationships with mycorrhizae (Gange.2000).

Springtails have great affinity with the edaphic habitats, they are found in great variety of ecological habitats and can be associated with several organisms such as fungi and epiphytic plants.(Palacios-Vargas &Go'mez- Anaya 1994, Palacios-Vargas &Gastano-Meneses 2002). In natural environments, Collembola feed on a great variety of resources such as fungi, bacteria, mosses, pollen grains, spores, decaying plants and debris. (Mcmillan and Healey 1971, Vegter 1983, Sadaka- Lulan et.al.1998).

Other factor which is considered to have a high influence on the food preference is the microhabitat where they are living; but there are cases where the species share the microhabitat, but differ in the food they take ( Ponge 1991). So, it has been observed that in soil and litter there is preference for fungal spores and mycelia, bacteria and faecal pellets (Rosello et.al.1986), while the species which climb trees or always live in the canopy, ingest pollen grains and spores more often ( Christian-Sen, 1964).

The main purpose of this contribution is to study the gut contents of different species of Collembola, to know their food preferences. Specimens are from three different habitats, fruiting bodies of

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## STUDY OF THE EFFECT OF METAL CONTAMINATION ON THE POPULATION OF THE BEETLE, *PTEROSTICHUS OBLONGOPUNCTATUS F.*

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### ABSTRACT

The negative effect of metals in terrestrial ecosystems has been shown so far little decomposition process and some soil-dwelling invertebrates. Organisms inhabiting contaminated areas can be stressed by metal exposure for a prolonged time and are possibly subjected to selection for increased resistance to metals. This may result in physiological or behavioural adaptations to long term sub-lethal metal exposure. The aim of the present study is to determine effects of prolonged metal contamination on population parameters, especially reproduction, in the forest living ground beetle, *Pterostichus oblongopunctatus F.* from five study sites with different metal pollution. The observed decrease in the reproductive rate in carabids originating from highly contaminated areas seems to support the hypothesis of a trade-off between efficient decontamination and productivity

**Key words:-** Terrestrial, Invertebrates, Sub-lethal, Contamination, Trade-off

### INTRODUCTION

One of the major problems in anthropogenically contaminated terrestrial ecosystem is the accumulation of metals in soil surface layers due to the high affinity of metal ions to soil organic matter. Even at moderate inputs, metals can reach high concentrations after prolonged input with dust & rainfall, (Kaminski & Landsberger, 2000). The negative effect of metals in terrestrial ecosystems has been shown so far little decomposition process and some soil-dwelling invertebrates. (Donker, 1992; Spurgeon and Hopkin, 1996). It is seen that some earthworm populations can tolerate heavy metal concentrations to induce lethal effects in non-tolerant populations. (Sturzenbaum *et al.* 1998).

Results of a number of laboratory studies contradict some field observations in which viable populations of animals were found at soil contamination of metals in soil or food. (Posthuma and Van Straalen, 1993, Hopkin and Hames, 1994). Such discrepancies suggest that, unfortunately, results derived from laboratory cultures cannot be easily translated to expected field effects and studies on field populations are indispensable.

Organisms inhabiting contaminated areas can be stressed by metal exposure for a prolonged time and are possibly subjected to selection for increased resistance to metals. This may result in physiological or behavioural adaptations to long term sublethal metal exposure. (Danker and Bogert 1991; Posthuma and Van Streaden 1993). As an organism has to allocate energy to resist the toxicant by avoidance, exclusion; and this will inevitably decrease the amount of energy available for other processes, such as growth or reproduction. Consequently, evolution of tolerance may lead to changes in a number of physiological and ecological characteristics: reproduction, transpiration, respiration, tolerance to additional environmental stressors such as food deprivation, insecticides, infections and climatic stress. (Holmstrup *et al.* 2000; Stone *et al.* 2001).

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## STUDY OF THE NUTRITION AND FEEDING BEHAVIOUR OF THE HEMIPTERANS ON LESS PREFERRED PLANT FOOD SOURCES.

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### ABSTRACT

Phytophagous hemipterans are in general polyphagous, feeding on a wide variety of plants. Among these, they also explore less preferred plants as their food and shelter. To illustrate this, I will discuss the feeding behaviour of green stink bug, *Nezara viridula* (Pentatomidae) on less preferred plants in Dhanbad district. This bug feeds on several uncultivated wild and on cultivated plants, which are less preferred, changing its feeding behaviour from a typical seed/fruit sucking habit to leaf/stem feeding. Other seed suckers such as *Euschistus heros* (F), and *Dichelops melacanthus* (Dallas), and *Neomegalotomu sparvus* Westwood (Alydidae) also change their feeding behaviour from seeds to vegetative tissues (leaf, stems) while feeding on less preferred food plants.

**Key words** :- Hemiptera, Pentatomidae, Polyphagous.

### INTRODUCTION

The insects must adapt to explore alternate food plants, in order to compensate for the changes in the quality of the food; when the most suitable and preferred hosts are unavailable. Insects have several type of compensatory responses when faced with the scarcity and variability in the quality of foods. Simpson & Simpson (1990) had said that there are three main compensatory responses viz...altering consumption, dietary selection & post ingestive compensation. In this study, data from other species of Hemipterans studied under similar circumstances will be touched on, as well. The aim of the present study is to present an extensive review of the feeding behaviour of hemipterans on less preferred plant food.

### MATERIALS & METHODS

This study is based on field observations & on laboratory studies conducted mostly with a pentatomid, the green stink bug, *Nezara viridula* (L), a major pest of soyabean crop, (*Glycine max.*)

### RESULTS

Phytophagous hemipterans feed by inserting their stylets into plant tissues and injecting a watery saliva, which contains digestive enzymes, sucking out the liquid food content (Miles, 1972). This lacerate-and-flush mode of feeding probably evolved from a rasping sucking type of feeding. (Singh & Amita, 2019). Pentatomids *N. viridula* prefer legumes and brassicas, (Todd & Herzog, 1980); another pentatomid, *Edessa mediatunda* (F), prefers legumes and solanaceous plants (Silva *et al.* 1968); and species of the genera *Acrosternum* and *Euschistus* feed preferably on legumes, while species of the genera *Oebalus*, Mormidae, *Aelia* and *Eurygaster* prefer to feed on graminaceous plants. These trends in feeding behaviour make hemipterans survive better during non-availability of preferred foods.

Seeds and immature fruits are the main feeding sites of hemipterans (Schuh & Slater, 1995). Seeds are packages of highly concentrated nutrients compared to other parts. This characteristics of seed make it as a preferred food; from which nutrients are more easily obtained. (Slansky & Panizzi, 1987). When seeds are not available, seed suckers are able to obtain nutrients from other plant tissues, such as growing

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