



BIODIVERSITY OF GRASSHOPPER AROUND SONALA DAM, SONALA, DIST. WASHIM, (M. S.)

Dr. Ujwala P. Lande

Assistant Professor, Department of Zoology, Shri Shivaji College of Arts, Commerce & Science, Akola, (M.S.), India

ABSTRACT

Grasshoppers belong to order Orthoptera which is one of the largest and diverse groups of insects. They are dominant above ground invertebrates in cultivated and in natural grasslands ecosystems. The study of Biodiversity of grasshoppers around Sonala dam, Sonala was carried for the period of 6 months that is from August 2022 to January 2023. The specimens were collected from the surrounding area of Sonala dam. 13 species of grasshoppers were collected from different habitats and different sites. During the Course of study, 13 species of grasshoppers belonging to 13 Genera, 5 families viz. Acrididae, Tettigoniidae, Mantidae, Pyrgomorphidae and Gryllidae were found to be present in various habitat studied like hilly area, grasslands, grasslands plus shrubby area and agricultural fields.

KEYWORDS : Biodiversity, Grasshopper, Sonala.

INTRODUCTION

Grasshoppers and locusts in the suborder Caelifera, order Orthoptera are one of the most diverse and ecologically important insects found in the grasslands (Latchininsky et al., 2011). They are known to be crop pests especially species like Schistocerca gregaria, Locusta migratoria migratorioides, Anacridium spp., Nomadacris septemfasciata, Zonocerus elegans, Zonocerus variegatus, Phymateus viridipes and Phymateus saxosus (Meynard et al., 2017). Their defoliation mode reduces the photosynthetic area of the leaves and their ability to aggregate facilitates mass feeding and hence, more crop destruction (Skaf et al., 1990; Safi, 2017; Lomer et al., 2001). Moreover, some species of locusts and grasshoppers are used as human food such as Sphenarium purpurascens, Oxya hyla hyla and Acanthacris ruficornis. From literature, they are good sources of amino acids, fatty acids, crude carbohydrates, fibre and ash (Ghosh et al., 2016).

The present study on grasshopper diversity was carried out at different sites around Sonala Dam, Sonala, Dist. Washim, (M. S.). The short horned grasshoppers were collected from these areas during the August 2022 to January 2023. Different areas were chosen with the intension of survey amongst different habitats which includes open grasslands, bushy vegetation with grass land patches, bushy areas, ground surfaces and cultivated areas.

MATERIALS AND METHODS

Study area

Sonala Dam reservoir was constructed in the year 1981. Agricultural fields surround the reservoir including dense vegetation. The reservoir is mainly used for drinking water supply to nearby villages and for irrigation. The nearby villages also use the water for bathing and washing purposes. The dam is constructed by irrigation department of Maharashtra Govt. The Sonala dam is located at 77°, 12', 30" Longitude and latitude of 20°, 19', 00" in Sonala village of Washim district in Maharashtra (India). It is an earthen dam with 19.20 meter maximum height and 446.90 hector submergence with 132.50 square Km. of catchment area. The dam is presently used for irrigation and drinking for regional rural areas. The reservoir is constructed on the River Aran also known as River Adan a tributary of River Godavari. Adan River in its way runs through the Maraldoh village, before draining in the dam.

Collection and photography of insects:-

Insects are a remarkable group of animals. They occur virtually everywhere and make up more than half of all living things on earth. Methods used for present study insect net, killing jar, forceps, relaxing jar, spreading board and pinning block, insect pins and labels, storage box. Before proceeding

to collecting the Grasshoppers the equipments used for collection was assembled. The equipment used were simple and inexpensive. The collecting kit include following items. Collecting net, Sweep Net, Forceps, Thermacol sheath, Pins, Notebook, Pencils, Camera, ethyl acetate, Adhesive solution. All collected grasshoppers specimens were identifying by using the identification key of www.insectidentification.org. also www.biodevercityexplorer.org, while some species are identify by using photographs and available research paper.

OBSERVATION AND RESULT

Diversity of Grasshopper

The study of diversity of grasshoppers around Sonala dam, Sonala was carried for the period of 6 months that is from August 2022 to January 2023. The specimens were collected from various sites surrounding the dam. There were 13 species of grasshoppers collected from different habitats and different sites. During the Course of study, 13 species of grasshoppers belonging to 13 Genera, 5 families viz. Acrididae, Tettigoniidae, Mantidae, Pyrgomorphidae and Gryllidae were found to be present in various habitat studied like hilly area, grasslands, shrubby area, grasslands plus shrubby area and agricultural fields. The total species were observed and collected tabulated in Table I and Photoplate I, II, III.

Using an identification key

This study reveals that in the morphological identification of Grasshoppers, keys like strong hind legs for jumping, coloration for defensive function from predators as well as to attract the females when mating is required, size, shape plays an very important role. Following are the key identified varieties of grasshoppers from selected area.

Sr no	Commo n name	Cla ss	Orde r	Family	Genus	Specie s	Seas onal occur ance	Collec tion place
1	America n bird grassho pper	Inse -cta	Ortho pt- era	Acridid ae	Schist ocerc a	S. america na	Aug- jan	Yeoda
2	House cricket	Inse -cta	Ortho pt- era	Gryllid ae	Achet a	A .dome sticus	Aug- jan	Pimpa lkhuta
3	Prayin g ma ntis	Inse -cta	Ortho pt- era	Mantid ae	Manti s	M. religio sa	Aug- jan	Sasan
4	Black winged grassho pper	Inse -cta	Ortho pt- era	Acridid ae	Dissos teira	D. carolin a	Aug- jan	Rama gad

5	Bush cricket	Insecta	Orthoptera	Tettigoniidae	Tettigonia	Tettigonia caudata	Aug-Jan	J.D patil college
6	Chinese mantis	Insecta	Orthoptera	Mantidae	Tenodera	T. aridifolia	Aug-Jan	Daryapur
7	Tobacco grasshopper	Insecta	Orthoptera	Pyrgomorphidae	Atractomorpha	A. crenulata	Aug-Jan	Chandrabhaga river
8	Band winged grasshopper	Insecta	Orthoptera	Acrididae	Oedaeus	O. infernalis	Aug-Jan	Daryapur
9	Migratory Locust	Insecta	Orthoptera	Acrididae	Locusta	L. migratoria	Aug-Jan	Chandrabhaga river
10	Giant Asian mantis	Insecta	Orthoptera	Mantidae	Hierodula	H. patellifera	Aug-Jan	Chandrabhaga river
11	Long headed grasshopper	Insecta	Orthoptera	Acrididae	Acrida	A. cinerea	Aug-Jan	Yeoda
12	Differential grasshopper	Insecta	Orthoptera	Acrididae	Melanoplus	M. differentialis	Aug-Jan	PimpalKhuta
13	Velvet-stripped grasshopper	Insecta	Orthoptera	Acrididae	Eritettix	E. simplex	Aug-Jan	Chandrabhaga river

• Spur-throated Grasshopper

All members of this group have a distinct conical or cylindrical spur between the front pair of legs. The front of the face points straight downward, perpendicular to the long axis of the body. Adults are strong fliers and capable of dispersing long distances. Many members of this group can be economically damaging to rangeland or cropland.

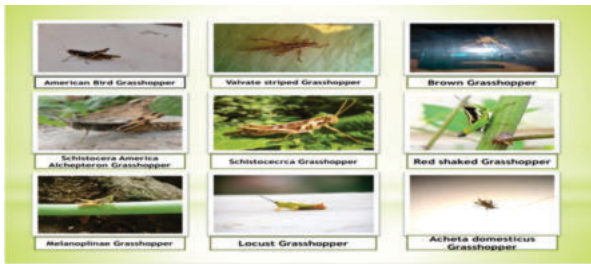


Photo Plate No. 1 Shows Diversity of Grasshopper

• Band-winged Grasshopper

The front of the face points straight downward, perpendicular to the long axis of the body. There is no spur between the front pair of legs. The hind wings of adults are often brightly coloured. Some species feed exclusively on grasses and sedges. They are usually present in low numbers and are not economically damaging.



Photo Plate No. 2 Shows Diversity of Grasshopper

Slant-faced Grasshopper

The front of the face slants back toward the body. There is no spur between the front pair of legs. The hind wings on adults are colourless.



Photo Plate No. 3 Shows Diversity of Grasshopper

DISCUSSION

Orthopterans play an important ecological role in many ecosystems. The study of grasshoppers play important ecological role in forest ecosystem in initiating and promoting the decay process of dead specimens. A large number of grasshoppers species are under the risk of extinction is the indication of environment influence. Insect outbreaks may have significant effects on an avian biodiversity, either directly by altering food availability or indirectly by altering habitat suitability. The presence of these species suggest that the study area might have abundant grasshopper's diversity. However it is suggested that the diversity of grasshoppers in these area should be studied exclusively. A long term study is needed to observe the species occurred all season and their interaction with the environment changes. Different habitat should also be studied for better results around Sonala dam.

Grasshoppers are plant-eating insects characterized by long hind legs designed for locomotion by jumping. Like all insects, the body of grasshoppers is divided into three main parts: head, thorax, and abdomen. On the head there are two antennae for feeling and detecting scent, and two compound eyes comprised of many optical units called facets, each of which is like a miniature eye. The chewing mouthparts comprise two sets of jaws which move from side to side. The sides of the mouth have two pulps, tiny appendages for feeling and detecting chemicals, which aid in food selection. There are three pair of legs and two pairs of wings attached to the thorax, although some species are wingless. At the tip of the abdomen there are two appendages called cerci, and the external reproductive organs, Females have an ovipositor at the end of the abdomen through which the eggs are laid. Grasshoppers develop by incomplete metamorphosis passing from egg to a small wingless larval stage through several molts, to the mature adult.

SUMMARY AND CONCLUSION

This study is an preliminary step to explore the Biodiversity of grasshoppers around Sonala dam, Sonala of Maharashtra (India). Study carried out only for short period that is from August to January. This work was an attempt to describe some aspects of biodiversity of Grasshoppers fauna. A lot of further work is necessary in the regard and further collections are essential for getting a detailed periodic estimate of the faunal diversity of grasshoppers in this area. Finally it is hoped that such work may lead to the development of standard monitoring procedure which could be of value in assessing the environmental stability of areas under cultivation of plants and the prediction of the effect on the structure of grasshopper populations of tropical forest destruction.

REFERENCES

- Latchinsky A, Sword G, Sergeev M, Cigliano MM, and Lecoq M. 2011. Locusts and grasshoppers: Behaviors, Ecology and Biogeography 2011: ID 578327. Doi:10.1155/2011/578327
- Meynard CN, Gay PE, Lecoq M, Foucart A, Piou C, and Chapuis MP 2017. Climate-driven geographic Distribution of the desert locust during recession Periods: Subspecies' niche differentiation and Relative risks under scenarios of climate change. Global Change Biology 23(11): 4739-4749. Doi: 10.1111/gcb.13739.
- Ghosh S, Parimalendu H, and Dipak KM. 2016. Evaluation of nutrient quality of a short Horned grasshopper, Oxya hyla hyla Serville (Orthoptera: Acrididae) in search of new protein Source. Journal of Entomology and

Zoology Studies 4(1): 193-197.

4. Lockwood DR and Lockwood JA. 2008. Grasshopper Population ecology: catastrophe, criticality, and Critique. *Ecology and Society* 13:34. <https://www.jstor.org/stable/26267932>.
5. Safi AIA, Mohamed EE, and Hamid AA. 2017. Estimating the area of Hashab tree (*Acacia senegal*) Defoliated by tree locust using supervised classification. *International Journal of Agricultural and Environmental Sciences* 2(6): 73-80