

INNOVATIVE SCIENTIFIC, BUSINESS AND SOCIAL PRACTICES FOR SUSTAINABLE DEVELOPMENT

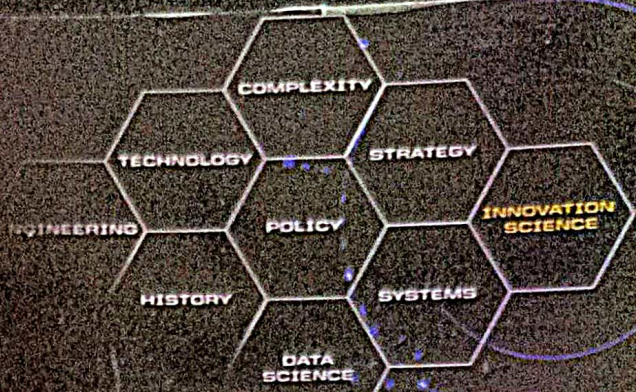
Chief Editor:

Dr. Naglaxmi N. Tirmanwar

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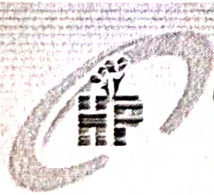
Innovative Scientific, Business and Social Practices for Sustainable Development

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GRASSHOPPERS DIVERSITY IN ANJANGAON SURJI REGION DISTRICT AMRAVATI (MAHARASHTRA), INDIA

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ABSTRACT:

Diversity can indicate environmental quality and is change over time. Diversity is often considered to be synonymous with species richness and relative species abundance. Insects are a class of invertebrates within the arthropod phylum that have a chitinous exoskeleton. Orthoptera is one of the largest order of insect comprising 26,950 valid species found throughout the world. These insects belong to the order Orthoptera and suborder Caelifera. Again this order is divided into two suborder i.e. Caelifera and Ensifera. Acrididea is the largest super family comprising 11,000 species worldwide and out of that 290 species representing 138 genera reported from India. The order orthoptera are distributed throughout the physiographic zones of the world but their distribution largely depends upon the vegetation prevailing in grass fields, forests and agricultural lands. Family Acrididae show maximum diversity, comprising 8,000 species and 28 genera are endemic. Grasshoppers are dominant

species in terrestrial landscapes having integral ecological roles the largest and most plentiful insects, yet they are least studied and poorly known for conservation. The present investigation reveals the occurrence of 12 species of grasshoppers belonging to 4 families and 11 genera from Anjangaon Surji region of Maharashtra.

KEYWORDS : Anjangaon Surji, Diversity, Grasshoppers, Maharashtra, Shahanur Dam.

Introduction

Diversity may be defined as, the total sum of species richness, that is the number of species of plants, animals and microorganism occurring in a given habitat (Wilson 1991). Insect diversity accounts for a large proportion of all biodiversity on the planet, with over 1,000,000 insect species described. Orthoptera is one of the largest order of insect comprising 26,550 valid species found throughout the world. The order orthoptera are distributed throughout the physiographic zones of the world but their distribution largely depends upon the vegetation prevailing in grass fields, forests and agricultural lands. Distribution of grasshoppers is determined by the temperature, seasonal precipitation of rain fall and soil conditions. India provides a unique habitat for this group of insects, for there exist humid commonly seen in autumn; a few appear in summer and spring. Habitat can varied, ranging from moist rain forests to hot deserts (Key and Hazra 2003). The habitats are generally concentrated in areas that have low growing plants, since they like to eat grass, leaves, and cereal crops. Grasshoppers are insects that belonging to order orthoptera and suborder Caelifera (Arnett 2004). The order is divided into two suborderie. Caelifera called short horned grasshopper and Ensifera called long horned grasshoppers. Acridoidea is the largest super family comprising 11,000 species worldwide and out of that 290 species representing 138 genera reported from India (Shishodia et al., 2010). Family

Acrididae show maximum diversity, comprising 8,000 species and 28 genera are endemic (Chandra and Gupta 2013).

Grasshoppers are funnily shaped and are distinguishable by their long legs and the surprisingly loud noise they make grasshoppers insects which can jump, walk and fly. They are divided into, head, thorax and abdomen. They also have 2 antennae, 2 pairs of wings and 6 legs. Grasshoppers migrate in case of adverse conditions, they can travel 15 miles or more per day. An adult grasshopper goes through the stages egg, immature (nymph) and adult, and has a lifespan of approximately one year. The diversity of grasshoppers has been studied by various researchers throughout India (Khalid 2013) morphological study of grasshoppers in Azadnagar, Walgaon Road, Amravati (Prabakar et al., 2015) studied Diversity of Insecta. Orthoptera of Kanchipuram District in Tamil Nadu, taxonomy distribution of Acridoidea (Orthoptera) of Bihar reported by, (Usmani and Nayeem 2012), (More and Nikam 2016) Studied on grasshoppers (Orthoptera) In Tilar Forest, Chandgad, Kolhapur District of Maharashtra (India), in which 17 species were studied. (Akhtar et al., 2014) They carried out Abundance, Distribution and Taxonomic Studies On hemiacridinae (Acrididae: Acridoidea: Orthoptera) In Uttar Pradesh, India in which they studied Members of the subfamily are large sized and generally called rice grasshoppers.

Orthoptera play an important role in the food chain by providing an abundant amount of protein to their predator's diets as well as nutrients to plants and also contribute to nutrient turnover in the ecosystem by returning nutrients as fertilizer to plants the study of grasshoppers play important ecological role in forest ecosystem. Study of grasshoppers is needed because 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. There is need to study diversity of grasshoppers in Anjangaon Surji region, as there were no previous records of grasshoppers and their diversity from this region. The study of grasshoppers play important ecological role in forest ecosystem in initiating and promoting the decay process of dead specimens.

3. Materials and Methods

Description of Study area:-

Anjangaon Surji is a city and a municipal council in Amravati district of Maharashtra, India. Anjangaon Surji Teshil was established in 1981. It is technically made up of two town main zones, Anjangaon and Surji, on either side of Shahanur River. It is called a Banana Hub of Vidarbha as it is a large producer of bananas and a hub of medicinal plants- Piper longum and Safed musali. The Shahanur dam is located in the north of the city in the ranges of Satpuda. Shahanur Dam is built using soil and has a hydroelectricity generation project and water supply project for nearly 156 villages and 2 cities based on gravitation without using electricity. For present study of grasshoppers seven sites of different habitat types were selected for the present work this site includes Murha, Borala, Anjangaon Surji, Shendgaon, Shahanur Dam, Takarkheda and R S. College taking under studied. This surrounding area is covered with dense lush green forest and semi evergreen mixed forest. **Collection period:-** for present study Grasshoppers species collected during month of September 2020- January 2021 in winter season.

Collecting and preserving methods and equipment 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

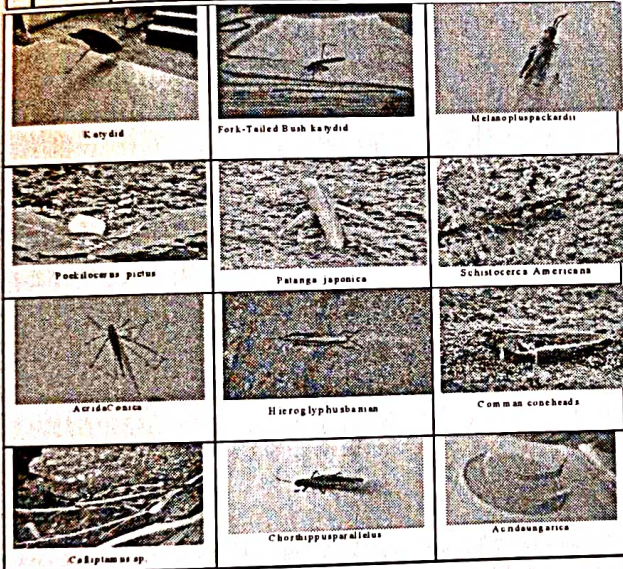
and labels, storage box. Before proceeding to collecting the Grasshoppers the equipments used for collection was assembled. The equipments used were simple and inexpensive. The collecting kit include following items. Collecting net, sweepnet, glass specimen tube, plastic jar, forceps, thermacool sheath, pins, notebook, pencils, formalin, camera, ethyl acetate, Adhesive solution. All collected grasshoppers specimens were identifying by using the identification key of www.insectidentification.org. also www.biodiversityexplorer.org, while some species are identify by using photographs and available research paper.

RESULT AND DISCUSSION

The study of Diversity of grasshoppers in Anjangaon Surji region was carried for the period of 6 months that is from September 2020 to January 2021. The specimens were collected from different region as Murha, Borala, Anjangaon Surji, Shendgaon, Shahanur Dam, Takarkheda and R S. College. Total 12 species of grasshopper was found all belonging to order orthoptera. These species including 4 families those are Acrididae, Tettigoniidae, Catantopidae and Pyrgomorphidae, among in which 7 families belonging Acrididae, 3 are belonging to family Tettigoniidae, then one each belonging to family Catantopidae, Pyrgomorphidae. The total species were observed and collected tabulated in Table I and Photoplate. 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 in Anjangaon Surji

Sr.	Common name	Class	Order	Family	Genus	Species	seasonal occurrence	Collection place
1.	Common Katydid	Insecta	Orthoptera	Tettigoniidae	<i>Pterophylla</i>	<i>camellifolia</i>	July-Jan.	Anjangaon Surji
2.	Fork-Tailed Bush Katydid	Insecta	Orthoptera	Tettigoniidae	<i>Scudderia</i>	<i>furcata</i>	July-Jan.	Murha
3.	Melanoplus packardii	Insecta	Orthoptera	Acrididae	<i>Melanoplus</i>	<i>packardii</i>	July-Jan.	Shahanur Dam
4.	Poekilocerus pictus	Insecta	Orthoptera	Pyrgomorphidae	<i>Poekilocerus</i>	<i>pictus</i>	July-Jan.	Borala
5.	Acrida Conca	Insecta	Orthoptera	Acrididae	<i>Acrida</i>	<i>conca</i>	July-Jan.	Shendgaon
6.	Patanga japonica	Insecta	Orthoptera	Catantopidae	<i>Patanga</i>	<i>japonica</i>	July-Jan.	Anjangaon Surji
7.	Schistocerca Americana	Insecta	Orthoptera	Acrididae	<i>Schistocerca</i>	<i>americana</i>	July-Jan.	Shendgaon
8.	Rice grasshoppers	Insecta	Orthoptera	Acrididae	<i>Hieroglyphus</i>	<i>banian</i>	July-Jan.	Borala
9.	Common coneheads	Insecta	Orthoptera	Tettigoniidae	<i>Neoconocephalus</i>	Sp.	July-Jan.	Shahanur Dam
10.	Calliptamus sp.	Insecta	Orthoptera	Acrididae	<i>Calliptamus</i>	<i>calliptamus sp.</i>	July-Jan.	Takarkheda
11.	Acrida ungarica	Insecta	Orthoptera	Acrididae	<i>Acrida</i>	<i>ungarica</i>	July-Jan.	Anjangaon Surji
12.	Meadow grasshoppers	Insecta	Orthoptera	Acrididae	<i>Chorthippus</i>	<i>parallelus</i>	July-Jan.	Shahanur Dam



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