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IMPORTANCE OF ORTHOPTERA FOR ENVIRONMENT IN LADPURA REGION OF KOTA, RAJASTHAN

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Abstract: *Grassland*, water and air include and make our atmosphere, and it affects our life and all resources. All of them, forestry is an important part of resources from our environment which is directly related to human growth. It also supports the homeostasis of the environment. This forestry is affected by many substances. Forestry mainly includes grasslands. Kota is known for their various kinds of climate changes or important groups of insects as orthoptera for their environmental and ecosystematic values. Orthoptera maintains the homeostasis of the environment. The order is subdivided into two suborders: Caelifera – grasshoppers, locusts, and close relatives; and Ensifera – crickets and close relatives. An orthopteran in Rajasthan had a variety of Acrididae family. They were herbivore and dominant in nature. They are terrestrial in nature with the temperature of 25 and 30°C. Over the course of year, the temperature typically varies from 57° F to 107° F. These variation activities are from mid-March to mid-April and from early October to early November. In this time Orthopterans show their abundance. Making a more efficient place for plants and other animals to thrive. Their waste is good fertilizer. Their life is the primary source of food chain and secondary food source of many animals. They keep plant life under control and balance. So, saw a species from Ladpura is ***Melanoplus bivittatus*** also known as two-striped grasshopper. A pair of pale-yellow stripes running along the top of its body from above its eyes to the hind tip of its wings help to easily identify this species. ***Poekilocerus pictus***, the painted grasshopper, oak grasshopper or oak grasshopper, is a fairly large and brightly colored species of grasshopper found in India

Keywords: **Orthoptera, Environment, Ecosystem, Acrididae**.

Introduction

Grassland, water and air include and make our atmosphere, and it affects our11 life and all resources. Forestry is an important part of resources from our environment which is directly related to human growth. It also supports the homeostasis of the environment. This forestry is affected by many substances. Forestry mainly includes grasslands. This grassland has an enormous ecosystem, food web and food chain. The ecosystem includes a variety of animals. After producer, primary consumers include small insects. This belongs to the invertebrate phylum arthropod. In arthropods there is a largest class insect and insect including order orthoptera. The Order Orthoptera which includes the dreadfully destructive locusts is one of the largest orders of insects having over 17,250 species known to science global wise, of which more than 900 species recorded from India. The Orthopterans (Grasshopper) are distributed throughout the physiographic zones of the world, but their distribution largely depends upon the vegetations prevailing in grass fields, forests and agricultural lands. Temperature, seasonal precipitation of rain falls, and soil conditions are some important factors which also determine the distribution of orthoptera. India provides a unique habitat for this group of insects, for there exist humid grasslands in East and North-East India, semiarid grass plains in Northwest and Southern parts of India, vast agricultural fields, simultaneously forests and scrub jungles, vegetation adjoining lakes, river basins and numerous water 1 bodies scattered throughout the country (Dey, Anita, 1994).

Temperature of Rajasthan is suitable for this body. Any of a group or a single individual of jumping insects that are found in a variety of habitats known as grasshoppers. orthoptera found in greatest numbers in lowland tropical forests, waterless regions, and grasslands. They are mostly active in the day but feed at night. They have an enormous range of colors from green to olive or brown and may have yellow or red detailing. They do not have nests. Orthoptera is always seen by us in migratory form to find a new supply of food. It has 3 legs in his body. It has a specific plant or host plant called oak. orthopterans have a seasonal abundance nature. It has an economic importance for the environment. orthoptera has worldwide distribution. Human day by day have chiefly affected grasslands and scrub jungle areas of India. Many of the areas have been converted into agricultural land or huge industrial

complexes. Due to shrinkage of the grassland habitat, the population as well as diversity of species is reducing extremely fast. And to study the differences of the population we can use population dynamics. It includes the size of population, density of population, distribution of population. As we all know, gr needs 25-30`C temperature so that in district Kota has a number of species and Varity of distribution of grasshoppers.

Orthoptera is one of the most diverse Orders of Class Insecta. Locusts and grasshoppers constitute an economically important group of orthopterous pests that infest several cultivated and non-cultivated crops and belong to the suborder Caelifera in the Orthoptera. Orthoptera are widely distributed in all ecological systems with significant economic importance due to their destructive role in almost all types of green vegetation. If Species that change color and behavior at high population densities or swarming are called locusts. They take over green crops from the earliest days to present time. Acridoidea is a superfamily of grasshoppers under suborder Caelifera. The other super families of Caelifera are easily recognizable at sight and are not frequently encountered. The Super family Acridoidea constitutes the largest and most diverse group amongst the Orthoptera. A very high degree of adaptive radiation in the feeding apparatus of this group of Orthoptera is indicative of their diverse feeding habits. This super family is represented by over 200 genera, presently grouped under five families. Super family Acridoidea has shown maximum diversity and is divided into five families of which family Acrididae includes the forms which are widely distributed. The locust Schistocerca gregaria affect crops with heavy loss. The poultry farming in many areas of Rajasthan grasshoppers are fed the chickens as they are a good source of protein and other nutrition.

Methodology:

Materials and methods are a very important part of the research. Materials help with technical support and methods help with getting good results. A minor change in the method may make the major change in results may be positive or negative. Therefore, materials and methods have uncountable value in the research.

Orthoptera species were collected from various agro and forest ecosystems of Ladpura region from district Kota. Studies were made morphology and taxonomy of the species by using hand lens and compound microscope. Thus, collected common species of grasshoppers were killed in killing jar by using chloroform. Killed orthoptera species were settled on spreading board in a scientific manner and pinned and then dried in oven at 60° c temperature up to 1 hr. After observation, rare and live species of grasshoppers were released where they were collected. Dried specimens preserved in insect storage box. 4 to 5 naphthalene balls were also used for avoiding the fungal and other infections into storage boxes.

Orthopters species were collected from various agro and forest ecosystems of study area. Thus, collected common orthoptera species killed in killing jar by using chloroform. Then they put in 2 lit capacity plastic containers filled with 70% alcohol and closed.

Data and Sources of Data:

Table 1: Diversity of Orthopteran species in Kota

Suborder	family	Sub family	Genus	Place	References
Caelifera	Acrididae	Acridinae Catantopinae Hemiacridinae Oedopodinae Oxyinae Spathosterninae	***Melanoplus bivittatus, Poekilocerus pictus, Schistocerca americana, circotettix undutus, acrida conica, acrida ungarica***	Ladpura, Kota	Pareek et al., 2014 [12] Bhatia et al., 1965, [1] Kumar and Usmani, 2014 [8] Chandra et al., 1985, 1988 Chandra, 1990 [2, 3, 4] Sinha and Chandra (1987) [16] Pareek et al., 2017 [13]

	Pyrgomorphidae		***Atractomorpha sp. Pyrgomorpha sp. Chrotogonus sp.***	South-Ladpura Kota	Dhakad et al., 2016 [5] Jat et al., 2010 [7]

Conclusion

Kota district is broadly divided into five regions: Ladpura, Digod, Sangod, Ramganj Mandi, Piplada. Orthopteran species, particularly acridids and tettigonids, are found abundantly in the south Ladpura region. The present study elucidates the diversity and distribution of Orthopteran species based on earlier studies and systematic surveys in various regions of Rajasthan. Hence, the review gives comprehensive knowledge of Orthoptera fauna which would be used for future aspects of the development of insect resources and their industrialization. Orthopteran biodiversity can also be assessed for insect farming to explore nutritional value and therapeutic uses in sustainable manner.

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