Diversity of Odonates in Agricultural Field's of Satana (Baglan) Taluka, Nashik District, Maharashtra, India

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ABSTRACT:

The present survey has been carried out on Odonata of agricultural field, Satana (Baglan) Nashik district, Maharashtra because it is now clear that agricultural fields are unique ecosystem that provides several services to Odonates. So, the different Odonates depend on these fields and their diversity also signs of good health of agroecosystems. But now-a-day agricultural land are gradually decreasing due to the rapid growth of highways, housing and factories. So, Odonates of these fields are also under risk. This side of the agricultural area is less highlighted so the main aim of this study to the prepare a list of those odonates which use these fields. There is the study was carried out for a period of two years i.e. July 2019 to July 2021. There are total of 21 species of Odonates were recorded during the period of the study. Maximum of 9 species falls under family Libellulidae followed by 6 species falls under Coenagrionidae and followed by 4 species fall under Platycnemididae and Lestidae and Aeshnidae showed less species diversity and represented by only one species. There are the maximum species richness reported from Monsoon and post-Monsoon season.

Keywords: - Agricultural field, Satana (Baglan), Odonates, Dragonflies, Damselflies, Diversity, Distribution.

1. INTRODUCTION

The order Odonata includes some of most ancient and beautiful insects that ever-roamed Earth, as well as some of the largest flying invertebrates ever to have lived. Odonata consists of three groups: Anisoptera (includes dragonflies), Zygoptera (includes damselflies), and Anisozygoptera (a relict group represented by only two living species. Order Odonata is very diverse with about 5000 species, and its members are easy to observe. The life history of the odonates is closely linked with water bodies. They use a wide range of lotic and lentic water bodies and even though most species of odonates are highly specific to a habitat, some have adapted to urban areas and make use of man-made water bodies. Habitat specificity has an important bearing on the distribution and ecology of odonates [1]. The Odonates lay their eggs in all type of aquatic habitats, from still stagnant water to fast flowing rivers to water collected in tree-holes. The larvae of odonates are completely aquatic and effective predators. There are the newly emerged odonates

leave their emergence site and inhabit nearby landscape. The dragonflies are aerial predators and catch insects like Moths, butterflies, mosquitoes, bees and odonates on flight. The adult odonates feed on mosquitoes, blackflies and other blood-sucking flies and act as an important biocontrol agent of these harmful insects. Long term conservation of odonates and other freshwater biota can only be assured through appropriate national level policy interventions and definite freshwater biodiversity conservation programmes [2].

Odonates are ecological indicators[3]. The adults odonates are terrestrial and larvae are aquatic. Odonata play key roles in aquatic ecosystems, agro-ecosystems and forest ecosystems. Adult dragonflies and damselflies are the most easily recognizable insect taxa [4], due to their comparatively larger size amongst the insects, bright colours and diurnal nature with interesting behavioural patterns. The predator odonates are very important biodiversity controlling agents. Odonates are excellent model organisms for understanding key issues in ecology, animal behaviour, evolutionary biology and prey-predator relationship because of their short life history[5]. The main objective of the present study was to record odonates in the agroecosystem of Satana (Baglan) Nashik district, Maharashtra. This will help to assess the present day agro-ecosystem health and the changes in the system of crop management in future.

2. BACKGROUND AND OBJECTIVES

Odonata is a primitive order of class Insecta, comprising 3 suborders- Anisoptera (dragonflies), Zygoptera (damselflies) and Anisozygoptera [6]. Although they are terrestrial insects their life cycle is linked with aquatic habitat, as they breed and larvae develop in water. They are endangered to the changes in ecosystem and they are good ecological indicators. Odonates are good indicators of environmental changes as they are sensitive and are directly affected by changes in the habitat, atmospheric temperature and weather conditions [7]. They also act as bio-control agents, many species of odonates, inhabiting agro ecosystems, play a crucial role in controlling pest populations [8]. Odonate diversity greatly depends upon the habitat type [9]. Pollution and urbanization inauspicious affect the survival of odonates. Green patches with wetlands in highly industrialized area act as refugia for odonates [10]. Presence of large perennial water bodies and good aquatic vegetation can contribute to the abundance and species richness of odonates [11]. The main aim of this study to prepare a list of those odonates which use of agricultural fields.

3. MATERIAL AND METHODS: -

3.1. Study area:

The present study has been carried out for a period of July 2019 to July 2021 and conducted in the sites from agricultural field of Satana (Baglan) Nashik district, Maharashtra, India during the four different season i.e. month of Pre-monsoon (July to September), Monsoon (October to December), Post-monsoon (January to March) and Summer (April to June). Odonates watching and data recording have been done once a week for each month. Satana (Baglan) Nashik district. Important

agricultural crops in kharif bajra, jowari, tilli, maize and soyabean whereas in Rabi season cicers, wheat and gram linseed etc. are grown.

3.2. Data collection and Identification of Odonates:

The survey procedure involved spotting and taking a photographs of any individuals in its natural habitats, without collecting any specimens. Some species are collected using an entomological net. During the course of the survey photographic records of adult individuals of different Odonates species were maintained. The adult specimens were identified with the help of identification keys provided by Fraser [12,13] ; [14,15]

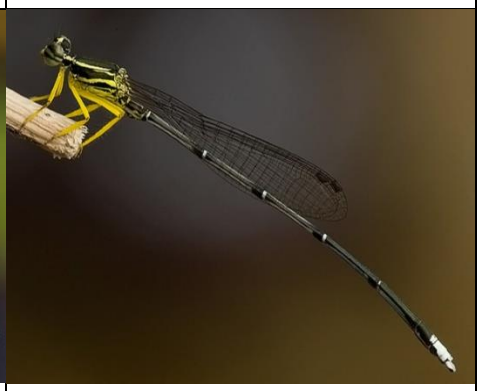
4. RESULT & DISCUSSION

A total of 752 individuals belonging to 21 species were recorded from agricultural field of Satana (Baglan) Nashik district, Maharashtra. The checklist of odonates, their habitat is given in Table 1. Diversity of odonates of 5 different families viz. ***Aeshnidae*** (Darners odonates), ***Lestidae*** (Spread Wings odonates), ***Coenagrionidae*** (Marsh Darts odonates), ***Libellulidae*** (Skimmers odonates) and ***Platycnemididae*** (Bush Darts odonates) were observed. Libellulidae was the most dominant family with (9 species) followed by Coenagrionidae showed highest dominance with (6 species) followed by Platycnemididae 4 species and Lestidae and Aeshnidae showed less species diversity and represented by only one species. Distribution of each family is given (fig.1). Agricultural land was dominated by Trithemis Pallidinervis which accounted for 97 individuals followed by Crocothemis servilia and Copera marginipes with 74 and 61 individuals respectively. Species such as Disparoneura qudrimacalata and Ischnura aurora were recorded from soyabean crop during pre-monsoon period while Diplacodes trivialis, Brachythemis contaminata, Disparoneura quadrimaculata, Elattoneura nigerrima, were recorded from sugarcane crop during last monsoon period. Few species like Pantala flavescens, Rhyothemis variegate, Diplocodes trivialis, Lestes praemorsus and Diplacodes haematodewere not observed in first year observation but they recorded in second year observation during Pre-monsoon period.

Table 1: List of Odonata fauna in agricultural fields of Satata (Baglan) Nashik district, (Maharashtra, India) during July 2019 to 2021.

		
Common name: Blue Darner **Scientific name**: Anax immaculifrons **Family**: Aeshnidae **Status**: Common	**Common name**: Ruddy Marsh Skimmer **Scientific name**: Crocothemis servilia **Family**: Libellulidae **Status:** Common	**Common name**: Green Marsh Hawk **Scientific name**: Orthetrum Sabina **Family**: Libellulidae **Status**: Common
		
Common name: Long legged Marsh Glider **Scientific name:** Trithemis Pallidinervis **Family:** Libellulidae **Status:** Common	**Common name:** Scarlet Marsh Hawk **Scientific name**: Aethriamanta brevipennis **Family:** Libellulidae **Status:** Common	**Common name:** Scarlet Percher **Scientific name**: Diplacodes haematodes **Family:** Libellulidae **Status:** Common

		
Common name: Wandering Glider **Scientific name:** Pantala flavescens **Family:** Libellulidae **Status:** Rare	**Common name:** Common Picture Wing **Scientific name:** Rhyothemis variegate **Family:** Libellulidae **Status:** Rare	**Common name:** Ground skimmer **Scientific name**: Diplocodes trivialis **Family:** Libellulidae **Status:** Rare
		
Common name: Coral-tailed Cloud Wing **Scientific name:** Tholymis tillarga **Family:** Libellulidae **Status:** Common	**Common name:** Brook Sprite **Scientific name:** Pseudagrion spencei **Family:** Coenagrionidae **Status:** Rare	**Common name:** Brown Dartlet **Scientific name:** Mortonagrion varralli **Family:** Coenagrionidae **Status:** Common

		
Common name: Golden Darlet **Scientific name:** Ischnura aurora **Family:** Coenagrionidae **Status:** Common	**Common name:** Yellow-striped Bluedart **Scientific name:** Pseudagrion rubriceps **Family:** Coenagrionidae **Status:** Rare	**Common name:** Pigmy Dartlet **Scientific name:** Agriocnemis pygmaea **Family:** Coenagrionidae **Status:** Common
		
Common name: Azure Dartlet **Scientific name:** Enallagma parvum **Family:** Coenagrionidae **Status:** Common	**Common name:** Sapphire eyed Spread Wing **Scientific name:** Lestes praemorsus **Family:** Lestidae **Status:** Rare	**Common name:** Yellow Blue Dart **Scientific name:** Copera marginipes **Family:** Platyenemididae **Status:** Rare

		
Common name: Black threadtail **Scientific name:** Elattoneura nigerrima **Family:** Platyenemididae **Status:** Common	**Common name:** Blue Bush Dart **Scientific name:** Copera vittata Selys **Family:** Platyenemididae **Status:** Rare	**Common name:** Black-Winged Bambootail Black **Scientific name:** Disparoneura quadrimaculata **Family:** Platyenemididae **Status:** Rare

5. CONCLUSION

The result of current survey of Odonata diversity and status of agro-ecosystem of Satata (Baglan) Nashik district is mostly high but cannot compare with past due to lack of previous data. Agro-ecosystems performs a variety of ecological services to odonates beyond the production of food. So, different odonates depend on agricultural fields, but now a days due to urbanization these animals are under risk. Therefore, protection measures are necessary for these beautiful creatures. The references of Odonata from the study area is very low and this study is useful for future research. The present study is first record of odonates in agricultural fields of Satana (Baglan) taluka Nashik District.

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