2018

MEENACHIL ODONATE SURVEY REPORT

SURVEY REPORT OF THRID MEENACHIL, ODONATE SURVEY

Organized by:

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In Collaboration with:
DEPARTMENT OF FOREST & WILDLIFE, GOVT. OF KERALA

Report of the

THIRD MEENACHIL ODONATE SURVEY

3-4 November 2018

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November 2018

1. INTRODUCTION

Kerala is well endowed with rich biodiversity with luxurious natural vegetation, crop diversity and wildlife. This is due to the high rainfall and the physiographic diversity created by the Western Ghats. Dragonflies and damselflies (Order- Odonata) are prominent and colorful insects of wetlands. About 5,000 species of odonates are found throughout the world. In India about 500 species and subspecies are reported and of this, about 150 species are found in Kerala. Odonates fauna in Kerala were scientifically elucidated by Fraser (1936-39). The study of dragonflies and damselfies are particularly important because of their life cycle closely associated with water bodies. Many of these insects have specific aquatic ecosystems varies from forest streams to manmade water bodies. Aquatic insects and other benthic invertebrates are the most widely used organisms in freshwater biomonitoring of human impact. Odonates are used as a popular tool for biomonitoring in aquatic ecosystem to analyse the impact of pollution and other anthropogenic disturbance. (Odonata; Philip. S. Corbet))

Introduction to Odonata

Dragonflies and damselflies are collectively called as Odonates, are one of the most common insects flying over forest, fields, meadows, ponds, wetlands, etc. it is distributed all over the world and India is highly diverse with more than 500 known species. They belonged to the Phylum Arthropoda in the Class of "Insecta" and the Order Odonata, which is divided into three Suborders, "Zygoptera, Anisoptera and Anisozygoptera, this classification is based on its morphology and odonates are one of the ancient orders of insects. The insects from Zygoptera are with slender long abdomen and keep fold their wings parallel to their body when in perching. They popularly have known as damselflies. The members of Anisoptera are comparatively stronger with sturdy body and open wings while they are resting. They are known as "Dragonflies". Insects from Anisozygoptera also have study body like dragonflies but while they are resting keep fold their wings like damselflies (Dragonflies and Damselflies of Peninsular India; K.A. Subramanian, 2005)

Dragonflies mostly occur in the vicinity of different freshwater habitats like rivers, streams, marshes, lakes and even small pools and rice fields. Odonates are good indicators of environmental changes as they are sensitive to changes in the habitats, atmospheric temperature and the weather conditions. They are biocontrol agents; many species of odonates inhabiting agro-ecosystems play a crucial role controlling pest populations (Species Diversity of Odonata in and around Nagpur City, Central India. Fraseria, 2008). The life cycle of dragonflies completed in three different stages of incomplete metamorphosis *i.e.* Egg, Larva and Adult. Eggs are normally elliptical or ball shape laid on aquatic vegetation, rock or sticks in water or nearby water bodies. Some of the dragonflies also laid eggs in the sand bed of dried rivulets or streams or inside the stem of grasses. Sometimes 5-6 moths will take the emergence for the larvae. Larvae feed on small aquatic insects or the larvae of other aquatic insects like mosquitoes. According to their growth rate larva moulted their skin 8- 15 times. One or two days before the emergence larva stop feeding and will float in the water. Then they perch on rock or sticks or any other vegetation above the surface of the water and the adult insect will emerge from the nymph. This will take some times few hours. Normally the emergence is happening in early morning or midnight. The newly emerged dragonflies will get the actual colors' only after few days. Adult dragonflies also feed on insects.

DEMANDS FOR STUDY ON ODONATES ALONG MEENACHIL RIVER BASIN

Meenachil River is the major river in Kottayam district and lakhs of people and many major towns depend on this for drinking, agriculture and other commercial activities. The river water enters the Vembanad Lake before reaching the sea. The entire river basin falls within the district of Kottayam. The main municipalities such as Kottayam and Pala and Panchayats like Erattupetta, Bharananaganam, Kidangoor, Ayarkunnam, Kumaranallor, Aymanam, Thiruvarppu, Vijayapuram, Ettumannor, Thidanadu, Thalappalam, Meenachil and Mutholy are situated near the bank of the river. (A watershed approach for sustainable ecosystem management of Meenachil River basin with emphasis on remote sensing and GIS; 2015).

METHODOLOGY

During the present investigation, the odonate (dragonfly and damselfly) survey was conducted for a period of 2 days (3rd to 4th November, 2018) as eight groups, consisting of 18 places. All these blocks were selected on the basis of the presence of different focal areas of the river. Each survey team was constituted with five members (3 odonate experts and 2 forest officials). Data sheets were provided to the team for recording the name of the species, location, habitat and the number of individuals seen during the time of investigation. The programme was started on 3rd November 2018, 9.30 am with a formal inaugural session followed by an introductory class by the odonate expert, Dr. Abraham Samuel K at TIES Grove Hall. The survey was conducted on 4th November and the data collected by each team members were compiled at 3. 00 pm. Photographs and sketches prepared by the team were also used for the compilation.

THIRD MEENACHIL ODONATE SURVEY REPORT

TIES conducted third odonate survey in Meenachil river basin on 3rd and 4th of November 2018 in collaboration with Department of Forests and Wildlife, Kerala (Social Forestry Division). On the first day, training was given to participants in order to familiarise odonates. Survey techniques were delivered and the whole team was divided into 6 groups each with an expert and 8-10 amateurs. Each team is assigned to cover two sample locations and at each spot, they have to survey an average length of 1-1.5 Km. A long stretch of the river. Field survey was conducted on the second day (4th November).

The Inaugural function (on 3rd November) started with a silent prayer. Dr. Punnen Kurian (Secretary, TIES) welcomed the participants. Presidential address was given by Dr. Abraham Samuel (President, TIES). The programme was inaugurated by Dr. G. Prasad, (Assistant Conservator, Social Forestry Division, Kottayam). He was very excited to see the participants who had keen interest to participate in the survey and he offered all assistance from the part of Forest Department. Sarath Babu proposed vote of thanks to the dignitaries and gathering. After the inaugural session, Dr. Abraham Samuel, President, TIES took a detailed lecture with the support of a beautiful presentation. He has given a basic understanding of odonates and narrated the survey methodology.

On the second day (4.11.18), field survey was conducted at about 15 sites along Meenachil river from Adukkam to Illickal of Kottayam. There were 6 teams each with an expert. The survey was carried out by the six teams in the regions, Adukkam-Erattupettah, Kidangoor-Punnathara, Thiruvanchoor-Poovathummoodu-Neerickadu, Pala town, Nagampadom-Elipulikkaattukadavu-Iranjal, and Kummanam-Aymanam-Illickal. More than 80 persons including students from 13 institutions participated. Social forestry Assistant Conservator Dr. G Prasad, Forest Officer Jayan M and experts like Dr. Abraham Samuel, Dr. Punnen Kurian, Dr. Nelson Abraham, Manoj P,

Sathrumitra, Nandu V S, Sarath N Babu, and M N Ajayakumar have led the survey. After the survey, valedictory function and publishing report were fulfilled at TIES campus. Participants were provided with Certificates.

Findings

- Odonates play key roles in both terrestrial and aquatic habitats. They are indicators of a fragile ecosystem. From this Survey, a total of 41 odonate species including 27 dragonflies and 14 damselflies were found.
- Survey result indicates that the number of damselflies found decreased compared to previous years.
- Comparing the results of each site, a higher number of species had found in the river starting point Adukkam region.
- Damselflies such as Malabar Torrent Dart (*Euphaea fraseri*), Clear winged Forest glory (*Vestalis gracilis*) and Black tipped Forest glory (*Vestalis apicalis*) were found only in few numbers in the river source areas. These damselflies prefer fresh water and flood may be the reason for their least number. The flood might have taken their eggs.
- Observations show that Ditch jewel (*Brachythemis contaminata*), a species prefer to grow in contaminated water has been increased in number in Kummanam, Illickal and other township areas. It was not found in the river source area like Adukkam region.
- Survey commented that the flood occurred in the Meenachil river could be the reason for the decreased number of damselflies. Their larvae may be leached out in the flood.
- The increased population of ditch jewel in the last sites (town areas- Pala, Kidangoor, Kottayam town, Illickal *etc*.) implies pollution in the river. The river in the town areas was human-disturbed and polluted.
- Location (sample site) wise analysis of odonate diversity showed that the highest number of species was recorded from Adukkam (23) followed by Kummananm – Aymanam-Illickal and Thiruvanchoor-Poovathumoodu (19 each).
- The highest number of a single species observed is of *Pantala flavescens,* followed by Picture wing (*Rhyothemis variegata*).

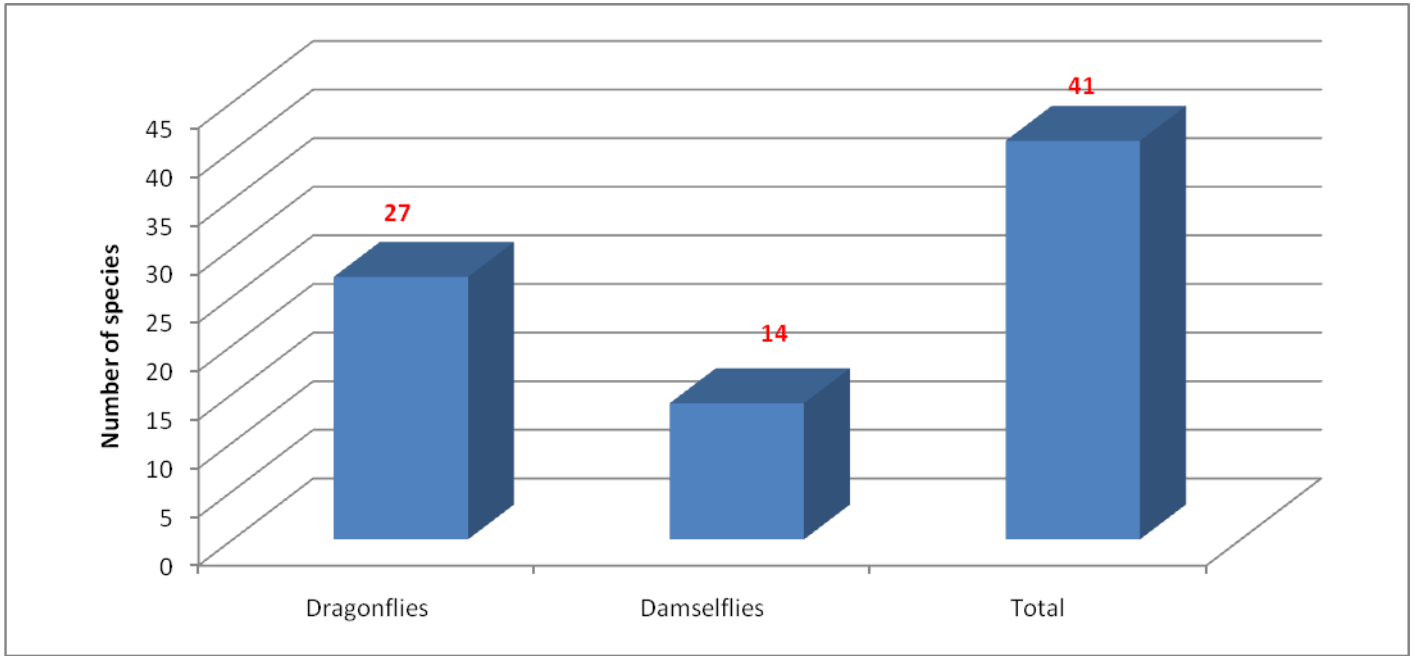

Fig.1. Total number of Odonate species in Meenachil river

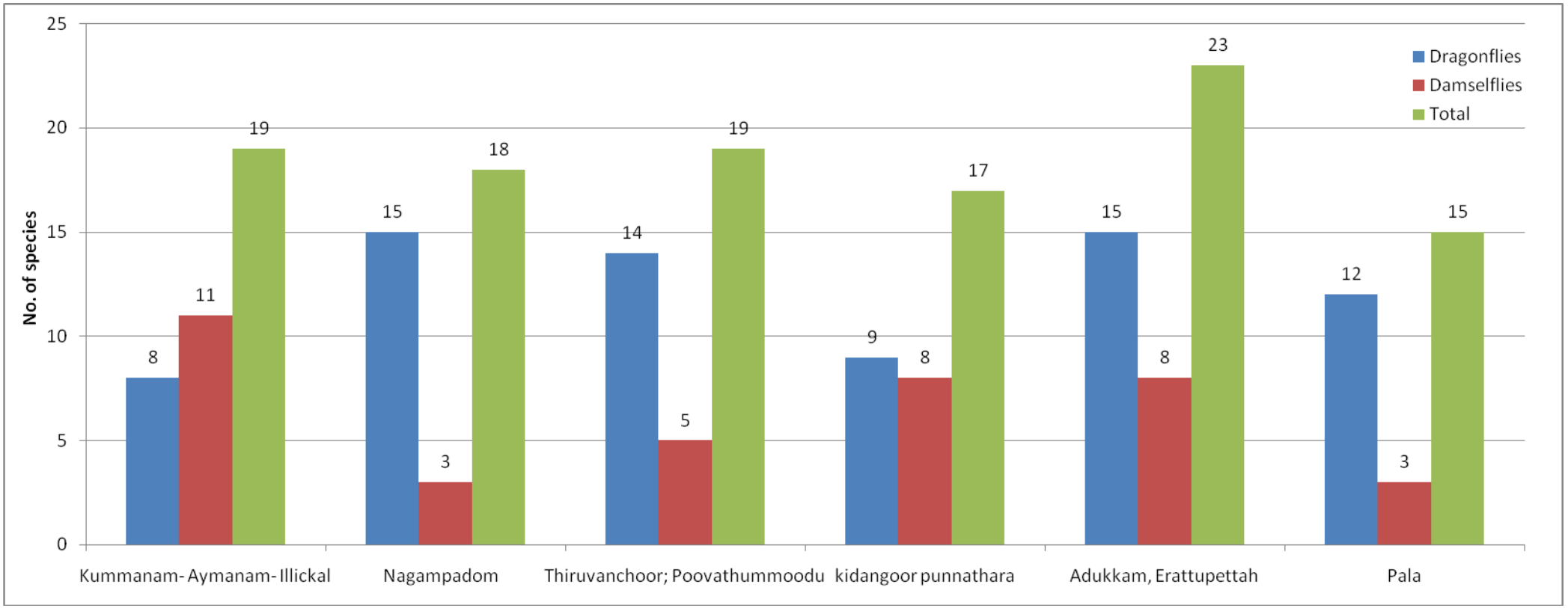

Fig.2. Data of dragonflies and damselflies; sample spot wise

Fig.3. Ditch jewel

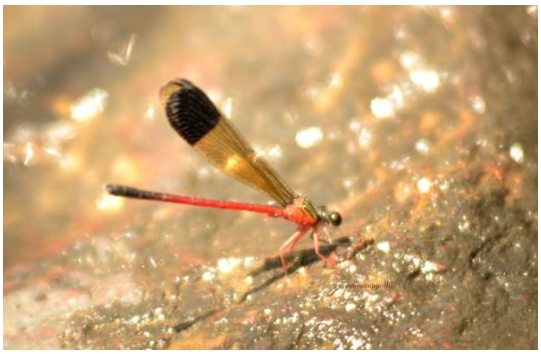

Fig.4. Malabar Torrent Dart

Fig.5. Clear-winged Forest glory

Fig.6. Stream glory

Fig. 7. Pre-Survey training

Fig.7. Field Survey

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