

Odonata Naiads of Potohar Plateau, Punjab, Pakistan

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Abstract:- A series of collection surveys conducted during two consecutive years (2011-12) to explore Odonata naiads of Potohar plateau revealed 34 species under 6 families and 21 genera. Specimens were collected from different aquatic habitats that include almost all sort of waters including static, flowing, acidic, alkaline, brackish or saline. Details showing valid names, collection localities, ecological observations, number of individual male/female collected are provided for each species.

Keywords: Odonata, naiads, Potohar plateau, dragonflies, damselflies.

INTRODUCTION

Odonata, an order of flying insects, includes dragonflies and damselflies. They are medium to large sized insects and are amongst most ancient flying insects (Rehen, 2001). Their immatures are aquatic and can be found in flowing as well as in stagnant water bodies. Some species are narrow in their needs but others are generalists and can reside in almost all sort of water, whether acidic, alkaline, brackish or saline. Few prefer to live in running water, however, others prefer still water, marshes and bogs (Zia, 2010).

Naiads possess specialized labium for capturing their prey from distance (Elzinga, 1981). They popularly consume protozoans, minute crustaceans, mosquito larvae and adults, small fishes and tad poles (Boyd, 2005; Irshad, 2008; Din, 2012, Hinman, 1934a,b). Larvae have been released under many projects in domestic water storage tanks to suppress the development of disease carrying mosquitoes (Silsby, 2001). Feeding of Odonata naiads at mosquito larvae highlighted their use in dengue, malaria, yellow fever, vector control program.

Taxonomic studies on Odonata naiads are badly ignored in Pakistan. Past studies are mainly focused on adults of Odonata and work done on their naiads is negligible, yet only few records are

available up till now (Din, 2012). Keeping in view the lapses of previous studies, it was planned to conduct thorough surveys of Potohar plateau (Punjab province) to explore Odonata naiads fauna of this versatile plateau of the country.

MATERIALS AND METHODS

Collection surveys were carried out in following localities of four districts of Potohar plateau.

1. District Chakwal: Peer Nara (L1), Wallana Dam (L2), Ghurab Dam (L3), Kattas (L4), Choa Saiydan Shah (L5), Bhurpur (L6), Chakwal (L7).
2. District Attock: Fateh Jang (L8), Kheri moorat (L9), Qutbaal (L10), Taja Bara (L11), Shahpur dam (L12).
3. District Rawalpindi: Kahuta (L13), Tallain (L14), Simly dam (L15), Barakahu (L16), Shadran (L17), Murree (L18), Chakian (L19), Jatllan (L20), Dhoke Saidaan (L21), Pind bhagwal (L22), Athal colony (L23), Lake view park (L24), Ayub park (L25).
4. District Jhelum: Deena (L26), Jhelum city (L27), Mangla (L28).

Naiads were collected between 0800hrs to 1900hrs and were placed in glass vials with 95% alcohol, then were shifted to 70% alcohol with a few drops of glycerin added to it to avoid desiccation.

Naiads were identified under stereoscope following Musser (1962), Anjum (1997), Chishti (1988), Hussain (1988), Khaliq *et al.* (1994a,b, 1995), Yousuf *et al.* (1995,1996), Bouchard (2004) and Subramanian (2005).

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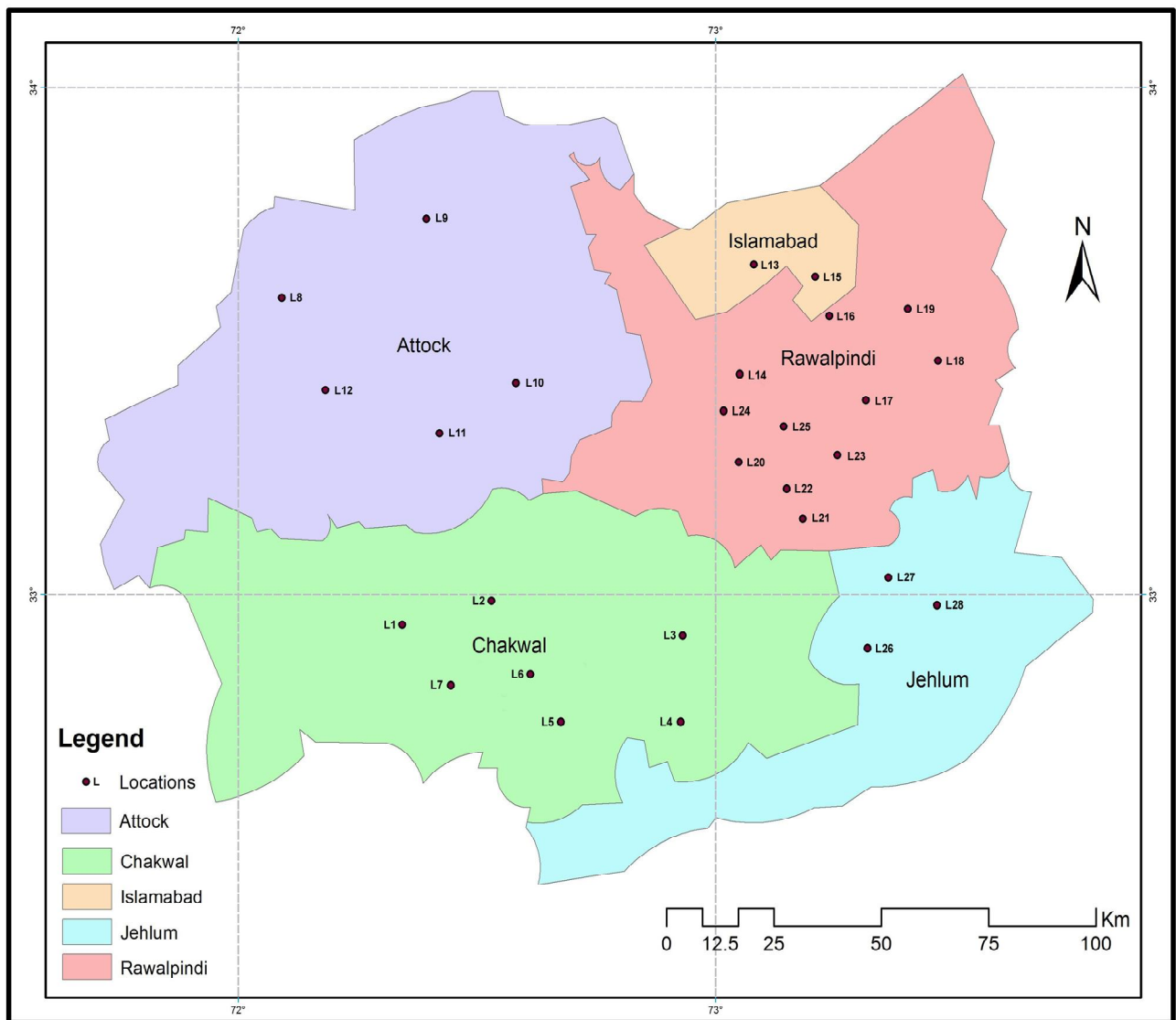


Fig. 1. Map showing surveyed localities to collect Odonata Naiads of Potohar Plateau, Punjab

RESULTS AND DISCUSSION

Collection surveys yielded a total number of 152 specimens comprising 34 species in 21 genera and six families (Table I). Out of total explored species, *Crocothemis erythraea* and *Pantala flavescens* were found dominant and abundant in the plateau thereby representing maximum number of specimens and found in variable habitats ranging from slow moving water to stagnant water of ponds. Maximum species richness was found in district

Chakwal representing 17 species out of total 21 species. Possible reason for this richness is that district Chakwal has a complex of agronomic crops grown herein as compared to other districts of plateau (Zia *et al.*, 2010) and being a predator of crop pests like aphid, jassids etc., Odonata prefers to visit crop fields for its host search. Also Chakwal district possesses a wide range of aquatic habitats (including ponds, basin, lakes, streams, rivers and springs) that are common breeding spots for many odonate species.

Table I.- Odonata Naiads collected from Potohar Plateau, Punjab

| Family | Species | Ecological observations | ♂/♀ Collected | Districts visited | | | |
|--------------------------|----------------------------------|---|------------------|----------------------|-------------------|-------------|-----|
| | | | | A | C | R | J |
| Gomphidae | <i>Gomphidia t-nigrum</i> | Collected from slow flowing clear waters with wild vegetation grown around it. They were also found under small stones and stick to grasses in water | 2♀ 3♂ | x | L5 | x | L26 |
| Cordulegasteridae | <i>Cordulegaster brevistigma</i> | Found in silty sand of brackish waters with no vegetation grown all around it. | 1♀ 2♂ | x | L7 | L17 | x |
| | <i>Anax immaculifrons</i> | Commonly found in variety of habitats like deep, shallow stagnant and flowing waters having grassy vegetation grown along these water bodies. | 4♀ 3♂ | x | L7 | x | L28 |
| Aeshnidae | <i>Boyeria irene</i> | Found in slow moving water of streams passing through big rocks. Naiads were found taking shelter with these rocks. | 2♀ 2♂ | x | | L22, L25 | x |
| | <i>Heminax ephippiger</i> | Naiads were collected from slow moving waters having dense vegetation grown along their banks. | 1♀ | L8 | x | x | x |
| Libellulidae | <i>Crocothemis erythraea</i> | Found in variable habitats i.e. from standing waters, ponds, slow moving waters of streams and even from dam waters, distributed in plains to mountainous areas. | 9♀ 26♂ | L9, L10, L11, L12 | L1, L3, L4, L6 | x | x |
| | <i>Crocothemis servilia</i> | Found in variable habitats i.e. Stagnant waters, slow moving to fast flowing waters. Many naiads were found stick to submerged vegetation. | 3♀ 6♂ | L10 | x | L13, L23 | x |
| | <i>Pantala flavescens</i> | Recorded from diversified habitats i.e. stagnant waters of ponds and dams, to slow moving waters of streams and dams out flow as well. It was found distributed among plains to mountainous areas of plateau. At all spots tall grassy vegetation was grown around and grasses were densely grown and submerged at banks. | 4♀ 7♂ | x | L1, L3 | x | x |
| | <i>Selysiathemis nigra</i> | Collected from clear waters of natural springs to stagnant pond water. | 2♀ 4♂ | x | L1, L3 | x | x |
| | <i>Sympetrum fonscolombei</i> | Recorded from slightly muddy and unclear waters of seasonal streams. | 4♀ 5♂ | x | L1, L3 | x | x |
| | <i>Libellula fulva</i> | Found only in slow moving waters with many larvae stick to vegetation grown at banks. | 6♀ 7♂ | x | x | L24 | L26 |
| | <i>Neurothemis tullia tullia</i> | Found in slow moving fresh waters of the springs with very little and dwarf vegetation grown all around and at banks. | 4♀ | x | x | L17 | x |
| | <i>Trithemis aurora</i> | Collected from slow moving streams and out flow of a dam. | 7♀ | x | L2 | x | x |
| | <i>Trithemis festiva</i> | Found in stagnant rainy waters. | 3♀ 6♂ | x | L2, L6 | L12 | x |
| | <i>Trithemis kirby kirby</i> | Recorded from shallow banks of a big water reservoir. | 2♂ | x | x | L24 | X |

Continued

| Family | Species | Ecological observations | Collected ♂/♀ | Districts visited | | | |
|-----------------------------|---|---|------------------|-------------------|--------|----------|---|
| | | | | A | C | R | J |
| | <i>Trithemis pallidinervis</i> | Recorded from shallow banks of a big water reservoir. | 3♂ | x | x | L24 | x |
| | <i>Acisoma panorpoides panorpoides</i> | Collected from temporary rainy water ponds to perennial stagnant waters. Distributed from plain areas to sub mountainous areas. | 1♀ 1♂ | x | L6 | L16 | x |
| | <i>Orithetrum</i> | Naiads were found flowing along and/or stick to grasses grown along slow moving seasonal streams to out flow of dams. | 2♀ 2♂ | x | L3, L7 | x | x |
| | <i>Chrysostigma luzonicum</i> | Found at shores of a big river and out flow of big dam. Naiads were collected from the vegetation grown inside and along banks of these water bodies. | 2♀ 4♂ | x | L2 | L19 | x |
| | <i>Orithetrum chrysis</i> | Found at shores of a big river and out flow of big dam. Naiads were collected from the vegetation grown inside and along banks of these water bodies. | 3♀ 2♂ | x | x | L15, L25 | x |
| | <i>Orithetrum sabina</i> | Naiads were collected from the vegetation grown inside and along banks of these water bodies. | 1♂ | x | L3 | x | x |
| | <i>Orithetrum taeniolatum</i> | Collected from clear, slow moving waters of dam from the vegetation grown inside and at the margins. | 5♀ 2♂ | x | L3 | x | x |
| | <i>Ceriatrion coromandelianum</i> | As above | 2♂ | x | x | L24 | x |
| | <i>Ceriatrion pulchellum</i> | As above | 1♂ | x | x | L24 | x |
| | <i>Enallagma parvum</i> | Collected from slow moving waters. At one spot, it was an uplifted ground water (bored water) that formed a stream and passes between the crops. | 1♀ 3♂ | x | L8 | x | x |
| | <i>Ischnura senegalensis</i> | Recorded from very slow moving stream. Naiads were mostly caught after removing the rock stones present at the edges of this stream. | 1♀ | x | L8 | x | x |
| | <i>Pseudagrion decorum</i> | Collected from long grasses found in a stream that was getting water only after rains of prevailing monsoon season. Also collected from a fresh water spot. | 2♀ 2♂ | x | x | L13, L16 | x |
| <i>Pseudagrion laidlawi</i> | Recorded from a natural spring spot whose water was coming from up hill towards the plain area. Larvae were caught from the submerged vegetation grown along the bank of this stream. | 1♀ 2♂ | x | x | L13 | x | |
| <i>Pseudagrion spencei</i> | Collected from fresh water streams of mountainous areas. Larvae were found freely floating over water surface. | 2♂ | x | x | L11 | x | |
| <i>Rhodishmura nursei</i> | Recorded from a natural rain water pond that came into appearance just because of monsoon rains. The pond remains dry throughout the year. It was a very long pond having depth of at least 2 to 3 feet with grasses grown at its bottom. | 1♀ 1♂ | x | L9 | x | x | |

A, Attock; C, Chakwal; R, Rawalpindi; J, Jhelum.

Studies on taxonomic distribution of Odonata naiads in Pakistan have rarely been carried out in the past. Yet, lot of faunistic studies have been conducted recording species diversity of adult odonates. It is also important to document that being flying insects, odonates are known to fly long distances in search of food and ideal ecological conditions especially for temperature and humidity preferences. Reporting species diversity for Odonata of any area based on the collection of adults, arises doubts on their endemism (Zia *et al.*, 2011). Actual species composition for Odonata of an area cannot be claimed until and unless their naiads are collected from that particular area. Present study is an attempt to fill this gap.

Potohar was chosen as target area because of its versatility in climate as well as ecology. It is a plateau that comes under Punjab province and western parts of Azad Jammu and Kashmir thereby representing Oriental as well as Palearctic fauna. It has three major seasons *i.e.*, hot weather that prevails from the month of April to June with a temperature of 110°F max; rainy season that is spread over months of July to September with an annual average rainfall between 96 cm, and cold weather prevails during the months of October to March, when temperature falls to 40°F maximum (Umair *et al.*, 2012). Also here is found variety of aquatic habitats ranging from natural springs to stagnant ponds, lakes, streams, dams and perennial rivers. All these climatic conditions, aquatic habitats and temperature ranges are ideal for lot of Odonata species which highlights the possibility of more species diversity inhabiting this plateau, yet to be explored.

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