



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2019; 7(2): 190-193

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Received: 04-01-2019

Accepted: 08-02-2019

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Damselflies (Odonata: Zygoptera) fauna of district Swabi Khyber Pakhtunkhwa, Pakistan

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Abstract

Study was conducted to explore the damselflies fauna of District Swabi KP (Khyber Pakhtunkhwa) Pakistan. A total of 238 adult damselflies were collected from nineteen localities of the district during the summer seasons of 2015 and 2016. The result revealed 13 species, 10 genera under 05 families. The abundant family was recorded as Coenagrionidae with 07 species and 05 genera viz, *Rhode Ischnura* Morton, *Ischnura aurora rubilio* Selys, *Ischnura forcipata* Morton, *Ceriagrion coromandelianum* Fabricius, *Pseudagrion rubriceps* Selys, *Pseudagrion hypermelas* Selys, *Agriocnemis pygmaea* Rambur, followed by Family Chlorocyphidae with 03 species and 02 genera viz, *Libellago lineata lineata* Burmeister, *Rhinocypha trifasciata* Selys, *Rhinocypha quadrimaculata* Selys while other families i.e Calopterygidae, Protoneuridae and Euphaeidae were represented by single species and single genera each viz, *Neurobasis chinensis* Linnaeus, *Elatoneura souteri* Fraser, *Bayadera longicauda* Fraser. Details showing valid names, collection localities, number of individual male/female collected are provided for each species.

Keywords: adults, damselflies, distribution, odonata, swabi, taxonomy

1. Introduction

Damselflies are medium to large sized flying insects belong to suborder Zygoptera of the order Odonata. Damselflies are similar to dragonflies except possessing equivalent wings that are normally held open when at rest; comparatively eyes are well separated and weak fliers. In larval stage they are easily distinguished from dragonflies due to the presence of three externally visible gills on abdomen and have slender in shape [1]. Odonates undergo through incomplete metamorphosis with three life stages as egg, naiad and adult. Eggs are usually laid in tissues of underwater or partly submerged plants. Naiads are aquatic and can be observed in running as well as standing water bodies [2]. They may be medium to large size insects and are among ancient flying insects [3]. Their young one is aquatic which is found in flowing and stagnant water bodies. A few species are selective in their needs but most are generalists and can live in almost all kinds of waters, whether acidic, saline, alkaline, or brackish. Few choose to reside in moving water, but, others prefer still water, swamps, drenches, marshes and bogs [1]. Odonata feed on different insects such as mosquitoes, aphids, grasshopper, and black flies which is one of their many advantages. Some adults also visit the crop fields like rice and cotton in searching of food so in this way they helped in controlling pests of these crops [4]. They play a dynamic function in pest management and are useful to humans as they help in controlling numerous insect pests [5]. They are noted to prey on jassids, thrips, white flies of cotton [6]. and on white leaf hopper, white stem borer, yellow stem borer, plant hopper, leaf folder of rice under compelled feeding [7]. The female dragonflies and damselflies prey more number of insect pests as compared to their males [8]. In Pakistan, the occurrence and diversity of Odonata has been investigated by various workers reporting more than 123 species for the country [1, 9-15]. However, in previous studies no taxonomic study was carried out on the damselflies fauna of district Swabi. District Swabi situated in Khyber Pakhtunkhwa (KP) Province, Pakistan. It lies between the rivers of the Indus and Kabul. It is located at 72.47° East longitude, 34.12° North latitude. This area possesses with adjustable habitats and infinite resources of water like rivers, springs, canals and streams. Swabi possess both plain and mountainous areas, along with plenty of habitats supporting damselflies activity for a prolonged time period. Keeping in view of all these facts, a comprehensive survey was carried out to explore damselflies fauna of District Swabi and to study their distribution in this

unexplored area of Khyber Pakhtunkhwa (KP) Province, Pakistan.

2. Materials and Methods

Survey was conducted to collect adult damselflies of District Swabi KP Pakistan during summer seasons of 2015 and 2016. The specimen was collected from all tehsils of Swabi

covering the whole district. The localities are Adina L1, Yarhussain L2, Turlandi L3, Dagai L4, Shewa L5, Naranji L6, Azamabad L7, Saleemkhan L8, Maneri L9, Shamansor L10, Panjpir L11, Anbar L12, Lahor (Chota) L13, Marghuz L14, Topi L15, Gandaf L16, Ganiichatra L17, Kabghani L18, and Gabasnai L19 as shown in (Fig.1).

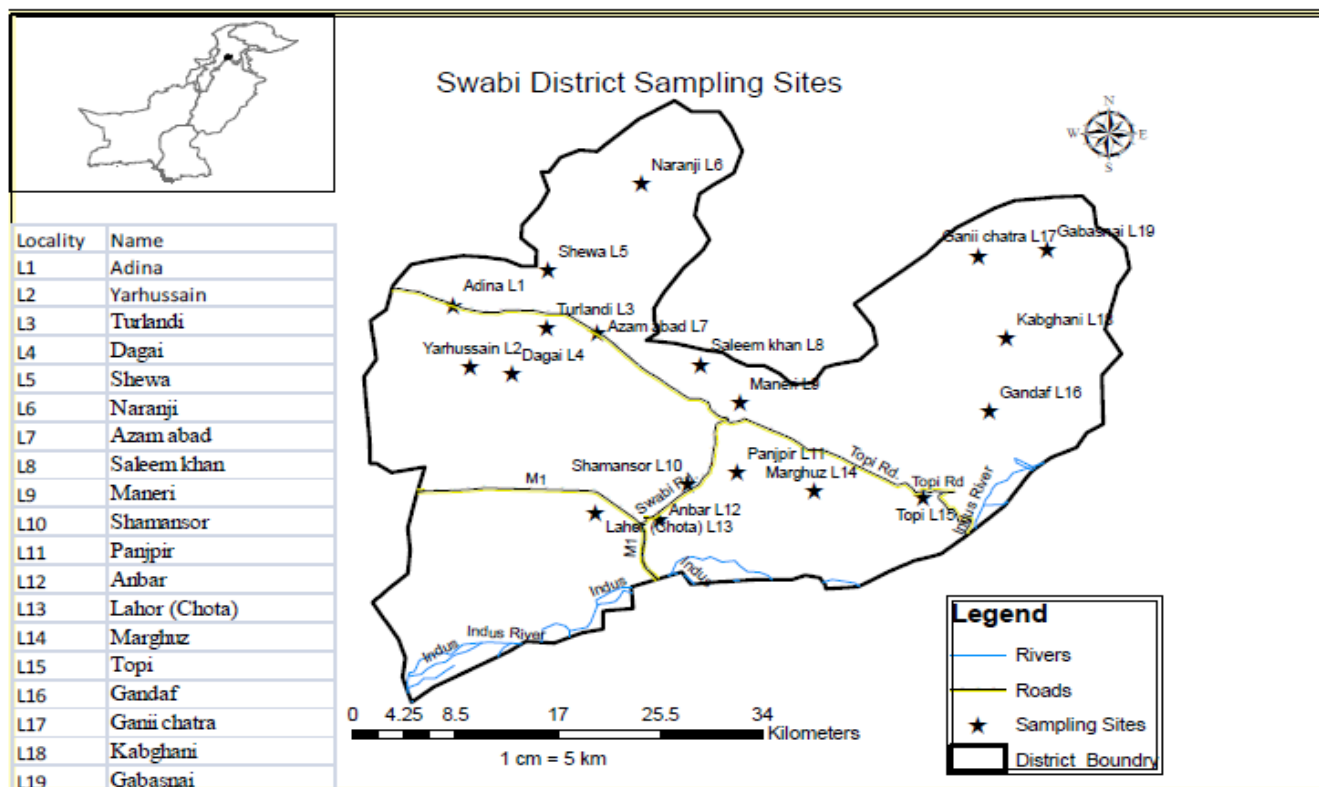


Fig 1: Map showing surveyed areas of district Swabi K.P Pakistan, where damselflies specimens were collected.

2.1 Collection and killing and preservation

The adult damselflies were collected on sunny days from 08 am to 05 pm with aerial net. The collected specimens were killed in a killing jar having ethyl acetate soaked cotton swabs. The killed specimens were taken from the jar and placed in a triangular paper envelope with their folded wings above the body. Collector name, date of collection and the locality was written on the paper envelope while other information like habitat had been noted in the field notebook. To avoid damaging the collected specimen was kept singly in each envelope. Specimens were appropriately pinned and the body part was set on setting board. When the specimen is become dried they had been shifted to collection boxes and were properly labeled and tagged. Naphthalene balls and powder was sprinkled in boxes to protect them from ants and other insects. The identification of specimens was carried out with the help of literature through [1, 16] up to the lowest possible taxa. The identified specimens were deposited in Insect Museum, Department of Entomology Agriculture University Peshawar and their representatives were deposited in NIM (National Insect Museum), NARC, Islamabad for future references and studies.

3. Results and Discussion

A total of 238 adult Damselflies specimen were collected from nineteen different localities of district Swabi. The collected specimen was identified in national insect museum, NARC Islamabad up to specie level. The result revealed 13

species, 10 genera under 05 families. In this the abundant family was recorded as Coenagrionidae with 07 species and 05 genera followed by Family Chlorocyphidae with 03 species and 02 genera, while other families i.e Calopterygidae, Protoneuridae and Euphaeidae were represented by single species and single genera each. Details description of each species, their synonym their habitat, collection date and distribution range were provided. *Bayadera longicauda* were recorded for the first time from K.P. province. Details for these species are provided below.

Family Calopterygidae Selys, 1850

Neurobasis chinensis Linnaeus, 1758

Material examined: Yarhussain, 23-v-2016, 04♂,03♀, leg. Rehman; Kabghani, 02-ix-2016, 04♂,02♀, leg. Khan; Gabasnai, 25-viii-2016, 01♂, Leg. Rehman.

Habitat: These damselflies were collected from fast moving streams and found sitting on bushes in water.

Previous record from Pakistan: From Punjab [1], K.P [1, 17], Azad Jammu and Kashmir [1, 18].

Family Chlorocyphidae Cowley, 1937

Libellago lineata lineata Burmeister, 1839

1839 *Calopteryx lineata* Burmeister

1840 *Libellago lineata* Selys

1842 *Micromeris lineatus* Rambur

1853 *Libellago lineata* Walker

Material examined: Adina, 19-vi-2016, 03♂, 4♀, leg.

Rehman; Yarhussain, 17-viii-2015, 03♂, 02♀, leg. Khan.

Habitat: These damselflies were documented and found sitting on long grasses or bushes in fast moving water streams.

Previous record from Pakistan: From Punjab^[1] and K.P^[17].

***Rhinocypha trifasciata* Selys, 1853**

1853 *Libellago trifasciata* Walker

1950 *Aristocypha trifasciata* Laidlaw

Material examined: Ganiichatra, 08-ix-2016, 03♂, 3♀, leg. Rehman; Kabghani, 13-vii-2015, 04♂, 03♀, leg. Latif; Gabasnai, 19-ix-2015, 03♂, Leg. Rehman.

Habitat

These specimens were recorded from water ponds in hilly areas. Two specimens were found sitting on small rocks in water or near water.

Previous record from Pakistan: Punjab, K.P, Azad Jammu and Kashmir^[1].

***Rhinocypha quadrimaculata* Selys, 1853**

1950 *Rhinocypha quadrimaculata* Laidlaw

183 *Libellago quadrimaculata* Walker

Material examined: Topi, 05-ix-2015, 04♂, 03♀, leg. Rehman; Gandaf, 20-viii-2016, 02♂, 01♀ leg. Ahmad; Kabghani, 02-ix-2016, 02♂, 03♀, leg. Ahmad; Gabasnai, 25-viii-2016, 02♂, Leg. Rehman.

Habitat: These specimens were recorded from water channels in mountainous areas. Four specimens were found sitting on small rocks in water.

Previous record from Pakistan: Punjab^[1], KP^[17] & Azad Jammu and Kashmir^[1, 18, 19].

Family Euphaeidae Selys, 1853

Bayadera longicauda Fraser, 1928

Gabasnai, 25-viii-2016, 01♂, 01♀ Leg. Rehman.

Habitat: These damselflies were found near water having tall vegetation in mountainous regions.

Previous record from Pakistan: From Punjab & Azad Jammu and Kashmir^[1]. New record to K.P.

Family Coenagrionidae Kirby, 1890

Rhode Ischnura Morton, 1907

1907 *Ischnura nursei* Morton

Material examined: Adina, 05-iv-2015, 05♂, 03♀, leg. Rehman; Naranji, 08-v-2015, 04♂, 03♀, leg. Khan; Shamansor, 29-viii-2015, 03♂, 02♀, leg. Latif; Topi, 02-x-2016, 02♂, leg. Rehman.

Habitat: These damselflies were found near standing water having grasses. One specimen was collected from rice field.

Previous record from Pakistan: From Punjab, Sindh, Baluchistan, K.P^[1] & Azad Jammu and Kashmir^[1, 17].

Ischnura aurora rubilio Selys, 1876

Material examined: Dagai, 14-viii-2016, 04♂, 03♀, leg. Rehman; Shewa, 21-vii-2016, 04♂, leg. Rehman; Maneri, 03-vi-2015, 03♂, 01♀, leg. Khan; Saleem Khan, 26-vi-2016, 05♂, 02♀, leg. Latif; Panjpir, 18-viii-2016, 13♂, 07♀, leg. Rehman.

Habitat: These damselflies were found in standing water streams with dense grasses.

Previous record from Pakistan: From Punjab^[1, 20], Sindh, Baluchistan^{[1, K.P^[1, 17]}, Azad Jammu and Kashmir^[1, 18].

***Ischnura forcipata* Morton, 1907**

1913 *Ischnura musa* Bartenev

1913 *Ischnura gangetica* Laidlaw

1965 *Agriocnemis nainitalensis* Sahnj

1933 *Coenagrion needhami* Navas

Material examined: Dagai, 14-viii-2016, 03♂, 02♀, leg. Rehman; Shewa, 21-vii-2016, 02♂, leg. Latif; Maneri, 16-x-2016, 03♂, 01♀, leg. Rehman; Saleem Khan, 25-vi-2015, 05♂, 03♀, leg. Latif; Panjpir, 29-viii-2015, 01♀, leg. Rehman.

Habitat: These damselflies were collected near rice field and from grasses among stagnant water bodies.

Previous record from Pakistan: From Punjab, Sindh, Baluchistan^[1], K.P^[1, 17, 20], Azad Jammu and Kashmir^[11, 18].

***Ceriagrion coromandelianum* Fabricius, 1798**

1798 *Agrion coromandelianum* Fabricius

1842 *Agrion cerinum* Rambur

Material examined: Adina, 19-vi-2016, 10♂, 06♀, leg. Rehman; Topi L15, 02-x-2016, 05♂, 2♀, leg. Rehman; Dagai, 10-iv-2015, 03♂, 02♀, leg. Ahmad; Marghuz, 05-viii-2015, 04♂, 02♀, leg. Rehman. Lahor (Chota), 29-vii-2015, 07♂, 03♀, leg. Rehman; Anbar, 25-viii-2016, 03♂, 03♀, leg. Khan.

Habitat: These damselflies were reported from water streams, weedy ponds and standing water bodies.

Previous record from Pakistan: This specie was recorded from Punjab^[1, 10, 21], Sindh, Baluchistan^[1], K.P^[1, 17], Azad Jammu and Kashmir^[18], Gilgit Baltistan^[12].

Pseudagrion rubriceps Selys, 1876

Material examined: Saleem Khan, 25-vi-2016, 02♂, 3♀, leg. Ahmad; Turlandi, 23-iv-2015, 02♂, leg. Rehman.

Habitat: These damselflies were reported from slow moving water streams, rivers and canals.

Previous record from Pakistan: From Punjab^[1], K.P^[1, 17] & Azad Jammu and Kashmir^[1, 18].

Pseudagrion hypermelas Selys, 1876

Material examined: Turlandi, 23-iv-2015, 02♂, 03♀, leg. Rehman; Shewa, 21-vii-2016, 04♂, 01♀, leg. Rehman; Shamansor, 23-vi-2016, 03♂, 01♀, leg. Latif.

Habitat: These damselflies were documented from wild vegetation near water streams or ponds.

Previous record from Pakistan: From Punjab^[1, 22], Azad Jammu and Kashmir^[1, 18].

***Agriocnemis pygmaea* Rambur, 1842**

Material examined: Marghuz, 05-viii-2015, 02♂, 03♀, leg. Rehman; Shamansor, 23-vi-2016, 01♂, 02♀, leg. Rehman.

Habitat: These damselflies were documented from thick and dense vegetation growing little away from water streams.

Previous record from Pakistan: From Punjab^[1, 22], KP^[1], Sindh^[1, 22], Azad Jammu and Kashmir^[1, 18].

Family Protoneuridae Tillyard, 1917

Elatoneura souteri Fraser, 1924

1924 *Disparoneura souteri* Fraser

Material examined: Anbar, 09-viii-2015, 02♂, 01♀, leg. Rehman;

Habitat: These damselflies were documented from slow

moving streams and lakes.

Previous record from Pakistan: This species was recorded from Punjab & K.P [1]. Keeping in view of previous studied on species composition and diversity of adult damselflies it shows that a lot of plentiful work has been carried out in Pakistan. Earlier work on damselflies fauna by [1, 10-12, 17, 18, 21-23]. However, the latest available information on a country record reported by [1] representing 53 species are accounted for providing an updated record for all modern taxa of damselfly fauna of Pakistan. In all of these studies District Swabi is ignored and no record available for Damselflies species of this important district up till now. Current study was designed to explore the species composition and distribution of Damselflies species of District Swabi Khyber Pakhtunkhwa (KP) Province, Pakistan. This District possesses both plain areas and mountainous areas with a plenty of aquatic habitats like stagnant ponds, dams, streams, canals and perennial rivers. All these habitats and topography of this District are ideal for a lot of Damselflies species which highlights the possibility of more species diversity inhabiting in this District.

4. Conclusion

Damselflies, a very important component of ecosystem and effective biocontrol agent of a crops are found rich in species diversity in District Swabi. The climate and topography of this area along with plenty of natural pastures and aquatic spots support damselflies life and biology

5. Acknowledgement

I am thankful to Prof. Dr. Sajjad Ahmad Department of Entomology, The University of Agriculture Peshawar, Pakistan for his critical insight, encouragement, consistent advice and technical guidance. I also thanks to Dr. Syed Ahmed Zia, Senior Scientific Officer, NARC Islamabad for their affection, help support and guidance.

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