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First record of *Anaciaeshna jaspidea* and *Epophthalmia vittata vittata* (Odonata: Anisoptera) from Pakistan

M. T. Chaudhry[1]*, A. Ul Mohsin[2], M. I. Bhatti[3], R. A. Javed[4], and G. Abbas[4]

[1]*Agricultural Training Institute Karor Lal Easan, District Layyah, Punjab, Pakistan*
[2]*Department of Entomology, PMAS, Arid Agriculture University, Rawalpindi*
[3]*Pakistan Museum of Natural History, Islamabad*
[4]*Adaptive Research Farm, Karor District. Layyah*
E-mail: drtariq273@yahoo.com

Abstract

During a survey of Sindh and Punjab provinces of Pakistan, two dragonfly genera were collected and identified for the first time from the country. *Anaciaeshna*(Family *Aeshnidae*) is a genus of large dragonflies. Representatives were collectedfrom Gujjo, District Thatta (Sindh) in August 2008 and were identified as *Anaciaeshna jaspidea* (Burmeister). The second genus was *Epophthalmia* (Family *Corduliidae*), medium to large sized, well-built and very fast flying dragonflies. *Epophthalmia vittata vittata* Burmeister (Family *Corduliidae*) was collected from Java Dam, Rawalpindi and Dhok Tallian Dam near Chakwal. Individuals of this genus were found maneuvering near the peripheries of small dams. Some taxonomic notes of the said species are provided.

Keywords*:* Dragonflies; first record of occurrence; Pakistan; taxonomic survey

1. Introduction

Dragonflies have been considered as indicators for the ecosystem health of freshwater wetlands. For the useful functioning of dragonflies as indicators, it is, however, very important to identify species compositions in specific habitats [1]. The Odonata fauna of Pakistan has been less explored than neighboring countries. During 1972, 46 species and subspecies belonging to 24 genera of 6 subfamilies of anisoptrous dragonflies were collected and identified from various localities of Pakistan [Yousuf, M. 1972. Ph.D. Thesis, Dept. Entomol., W. P. A. U. Lyallpur, Pakistan].

Dragonflies of family *Aeshnidae* are known as Hawks. They are large in size; blue, green, brown or yellow in colour with black markings. They are very powerful fliers, found long distances from water.

Only eight species representing the Family Aeshnidae were reported from Pakistan and those were *Aeshna juncea* (Linnaeus, 1758), *Anax immaculifrons* Rambur, 1842, *Anax indicus* Lieftinck, 1942, Anax *nigrofasciatus* Fraser, 1935, *Anax parthenope* (Selys, 1839), *Cephalaeschna masoni* (Morton, 1909), *Gynacanthaeshna sikkima*(Karsch, 1891) and *Hemianax ephippiger* (Burmeister, 1839) [2, 3, 4, {Ahmad, A. (1994). M. Sc. Thesis, Dept. Agri. Entomol., Univ. Agri., Faisalabad, Pakistan; Jehangir, Z. (1997). M.Sc. Thesis, Dept. Agri. Entomol., Univ. Agri., Faisalabad, Pakistan; Kanth, Z.I. (1985). M. Sc. Thesis, Dept. Agri. Entomol., Univ. Agric., Faisalabad, Pakistan}]. *Anaciaeshna jaspidea* was previously reported as *Aeschna jaspidea* [5] and *Anax jaspidea* [6]. Species of the genus *Anaciaeshna* are widely reported from Ethiopia, the Orient, Australia and Tahiti. *Epophthalmia* Dragonflies (Family Corduliidae)have been reported from India [Subramanian, K. A. (2005). Dragonflies and Damselflies of India-A field guide], Sri Lanka [7], Singapore [8], China [9], Indonesia and Japan [www.discoverlife.org].

2. Materials and methods

Two specimens of an unidentified dragonfly species were collected from Gujjo, an area 24 km far from Thatta in Sindh Province (Fig. 1) by the first author. The specimens were subsequently identified as 1 male and 1 female of the species *Anaciaeshna jaspidea* (Burmeister) (Odonata: Anisoptera: Aeshnidae) (Fig. 2-3) using the taxonomic keys of Fraser [10]. Other unidentified dragonfly specimens were collected from Rawalpindi and Chakwal. These were identified as *Epophthalmia vittata vittata*(Burmeister, 1839) (Odonata: Anisoptera: Corduliidae) (Fig. 4) using Fraser taxonomic keys

*Corresponding author
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[10]. Terminology used here follows that of Fraser [10].

Fig. 1. Map of Pakistan showing Rawalpindi, Chakwal and Thatta districts

Fig. 2. Female *Anaciaeshna jaspidea*

Fig. 3. Male *Anaciaeshna jaspidea*

Fig. 4. *Epopthalmia vittata vittata* Burmeister

2. 1. Key to Pakistan genera of Family Aeshnidae

1. Tornus rounded in male----------2
-Tornus angulated in male----------3
2. Abdominal segments 4-8 with lateral ridges----------*nax* Leach, 1815
-Abdominal segments 4-8 without lateral ridges----------*emianax* Selys, 1883
3. The nerve Riii abruptly curved beneath the pterostigma, M A fuse with Riv+v before wing border----------*Anaciaeschna* Selys, 1878
-The nerve Riii not abruptly curved beneath the pterostigma, M A not fused with Riv+v but forked----------4
4. Median space of wing traversed----------5
-Median space of wing entire----------*eshna* Fabricius, 1775
5. Dentigerous plates rounded or absent----------*Cephalaeschna* Selys, 1883
-Dentigerous plates end in 2 spines----------*Gynacanthaeschna* Fraser, 1921

2. 2. Key to Pakistan genera of Family Corduliidae

1. Discoidal cells in forewings and hindwings always traversed----*Epophthalmia* Burmeister, 1839
-Discoidal cells in forewings and hindwings always entire----------*Macromia* Rambur, 1842

3. Results and discussion

3. 1. Anaciaeshna Selys, 1878

Large dragonflies, two specimens were collected; agreed with the Fraser's description [10] of the two sexes of one species. This genus has not previously been recorded from Pakistan.

3. 2. Anaciaeshna jaspidea (Burmeister, 1839)

The male and female specimens are shown in Fig. 3 and Fig. 2, respectively. Wings of the two specimens collected were yellowish-brown in color. The forewings had 16-17 antenodal and 8 postnodal veins, and the hindwings had 10 antenodal and 11 postnodal veins. The pterostigma was pale yellow and covered 2.5 cells. The occiput was brown, the thorax pale brown with two pale yellow spots on each side and the anal appendages light brown. The abdomen of the male specimen measured 47 mm in length, while the forewing was 47 mm and the hindwing 45 mm. The abdomen of the female specimen is 45 mm long, with the forewing and the hindwing each 50 mm long.

Material Examined: ♂ = 01 ♀ = 01

3. 3. Distribution

These species were collected from Gujjo, an area 15 miles far from Thatta. The locality's Lat. is 24.44 N and Long. is 67.45 E at an elevation of seven meters (Table 1). This species is also reported from Australia, Indonesia, China, Hong Kong, Guandong, Japan, India, Philippines, Thailand and Taiwan.

Table 1. Geographical location and climatic conditions of *Anaciaeshna jaspidea* and *Epophthalmia vittata vittata*

Area	Species	Date	Lat. (N)	Long. (E)	El. (M)	Max. Temp. (^{0}C)	Min. Temp. (^{0}C)	Hum. (%)
Thatta	*A. Jaspidea*	23-08-08	24.44	67.45	07	35	26	63
Chakwal	*E. vittata vittata*	08-07-06	32.56	72.52	520	34.9	24.8	51
Rawalpindi	*E. vittata vittata*	14-07-06	33.36	73.02	500	36	26	59

3. 4. Remarks

These specimens were collected from a rice field under cloudy conditions in Gujjo which is 25 km far from Thatta in Sindh Province (Fig. 2). The field was surrounded by dense vegetative growth of numerous weeds and wild plants. A drainage ditch leading from the field contained tall plants of *Typha* spp. The greater crimson glider, *Urothemis signata* (Rambur) (Odonata: Libellulidae) was also collected from this area. *A. jaspidea* is a crepuscular species active during dusk and dawn. Ansori [11] collected *A. jaspidea* from paddy fields during surveys in Antapani, Cigadung, Dago Pakar and Dago Pojok in Bandung, Indonesia.

3. 5. Epophthalmia Burmeister, 1839

These are large dragonflies, fast fliers and have a brassy hue during flight. It has a brass colored abdomen with black marking. Two specimens were collected that tally with published descriptions of Fraser [10], identified as *Epopthalmia vittata vittata* (Burmeister, 1839). This genus has not previously been recorded from Pakistan.

3. 6. Epophthalmia vittata vittata Burmeister

These dragonflies are characterized as fast fliers and large in size. The abdomens of the collected specimens had black markings creating a brassy hue during flight. The frons was metallic green with a centrally-located yellow spot, and the thorax had metallic green markings. The discoidal cell of the forewing and hindwing was traversed, and the hindwing was angulated in the male. The pterostigma was black, while membranes of wing had black and white coloration. The forewings had 16-17 antenodal and 8-7 postnodal veins, while the hindwings had 11-12 antenodal and 10-9 postnodal veins. The abdomens of the two male specimens measured 55 mm in length, and the forewing and hindwing measured 53 mm and 50 mm long, respectively (Fig. 4).

Material Examined: ♂ = 02

3. 7. Distribution

Two specimens of *Epophthalmia vittata vittata* Burmeister were collected, one from a small dam "Java" 20 kilometers far from Rawalpindi city (Fig. 1). This species was collected during the afternoon of 14 August, 2006. The other specimen was collected from Dhok Tallian dam 10 km far from Chakwal city. *Epophthalmia vittata vittata* Burmeister is also reported from India [Kakkassery, F. K. (2000). Dragonflies and Damselflies of India] this species is also widely distributed in India and China.

3. 8. Remarks

Both specimens were collected as they were flying over the edges of the small dams with well-established vegetation. Individuals of this species also have been found on the edges of jungles in areas of low wetlands to hilly and dry zones [7] and on twigs and other vantage points over streams [Subramanian, K. A. (2005). Dragonflies and Damselflies of India-A field guide]. The species is also reported from India [Kakkassery, F. K. (2000). Dragonflies and Damselflies of India] and China.

4. Conclusion

Taxonomy is the science of the description and classification of organisms, and is essential in theoretical and applied biology. The taxonomy of living organisms is still a largely ignored field in Pakistan. As a result, the fauna and flora of Pakistan have mostly been studied by overseas specialists. *Anaciaeshna jaspidea* (Burmeister), (Family: *Aeshnidae*) and *Epophthalmia vittata vittata* Burmeister (Family, *Corduliidae*) are additions to the exiting fauna of dragonflies of Pakistan. With these additions, the number of species of family *Aeshnidae* becomes nine species belonging to six genera and *Corduliidae* three species of two genera. These additions are very

important in all kinds of biological research and the fauna of dragonflies will support all types of future entomological endeavors in Pakistan i.e. faunistic, zoogeographic, ecological studies and will provide necessary support to several other areas of research. These new data will improve our knowledge of the biodiversity and distribution of the species in Pakistan.

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