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Exploring the Dragonfly Fauna of Tehsil Tangi District Charsadda, Khyber Pakhtunkhwa, Pakistan

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Abstract
Present study were carried out in Tehsil Tangi, District Charsadda, Khyber Pakhtunkhwa, Pakistan. A total of 188 specimens of dragonfly were reported, these specimens belong to 2 (Libellulidae and Gomphidae) families, 7 generas and 11 species. Most numbers of species belonging to family Libellulidae 177 (94.15%) and the least numbers of species are belonging to family Gomphidae 11 (5.85%). Greatest plentiful genera is Orthetrum (87n) (46.28%), Tremea (23n) (12.23%), Pantala (19n) (10.11%), Trithemis (17n) (9.04%), Acisoma (16n) (8.51%) and the least number of dragonfly genera is Ictinogomphus (11n) (5.85%), followed by Crocothemis (15n) (7.98%). The supreme size of dragonfly is *Ictinogomphus ferox* (26.5±0.5 B.L) (17.5±0.4 Fore W.S) (16±2.0 Hind W.S) and the smallest size dragonfly is *Acisoma panrpoid panrpoid* (10.5±1 B.L) (8.5±0.7 Fore W.S) (7.5±0.5 Hind W.S). The aim of the present study to fully evaluate the predatory dragonfly fauna of District Charsadda, Khyber Pakhtunkhwa, Pakistan.

Keywords: Libellulidae, Gomphidae, Genera, Dragonfly.

1. Introduction
Dragonflies are belonging to the class Insecta, Order Odonata and Sub Order Anisoptra (the "toothed" insects) [1]. They are divided into three suborders the more delicate weakly flying damselflies (Zygoptera), the more robust dragonflies (Anisoptra) and a relict group of primitive dragonflies (Anisozygoptera) [2]. Odonata is one of the oldest groups of winged insects found today. Approximately 6000 species and subspecies to 630 genera in 28 families are known from all over the world [3]. Out of which 499 species and subspecies of Odonata under 139 genera in 17 families, are represented in India [4]. Even 5680 extant species, dragonflies are a relatively small order of insects [5]. Odonates are amongst the most vibrant and energetic of all insects [6]. Being vigorous, dragonflies often seen flying back and forth or darting about inconsistently, especially along the shores and over the waters of marshes, pond, rivers and lakes, from early morning until late evenings. Some species are also seen patrolling rapidly over streams and lakes or through the gardens at dusk. These conspicuous and brightly colored insects have long, slender abdomen and known as aerial predators, hunting by sight [7].

2. Method and Material
2.1 Study Area
The present study were conducted during June to September 2014 at Tehsil Tangi District Charsadda Khyber Pakhtunlhwa Pakistan.

3. Materials
During the present study material were used aerial net cyanide bottle, insect, scope and field book.

3.1 Collection and preservation
Dragonflies were collected from different area of Tehsil Tangi of District Charsadda by using aerial net, placed them in triangular envelope after killing them in cyanide bottle in order to bring them in the laboratory, pinned and their body parts were set on appropriate setting board

board on drying these were properly labeled and mounted in the collection boxes. Naphthalene balls were placed in the boxes to keep them safe from the pests.

3.2 Identification and Description
For identification, the Specimens were examined. The identification were done up to the specific level by running them through Fraser's (1934) key and already identified species which is placed in museum of National Insect Museum, (NARC). Valid names along with synonyms, habitat and distribution were given for the species already recorded from Pakistan. All the identified specimens were deposited in the Zoological Museum Department of Zoology Hazara University, Mansehra.

3.3 Morphometry and Photography
Thorax, abdomen and wings were measure with a finely pointed divider and a common scale ruler (5 of each 13 identified specimens were measure) after identification and measurement the specimen were placed on top of a bland white sheet of paper.

4. Data Analysis
Morphometry of species were estimated by using mean and standard deviation. Species richness, abundance and month wise abundance were analyzed through graphic representation.

5. Results
It is the first documentary study of the said area during June to September 2014. This Area is so rich on agriculture side as well as insect fauna. From the present study it was investigated that a total of 188 specimens were collected belonging to 2 families, 7 generas and 11 species. The large number of dragonfly belong to family Libellulidae 177 (94.15%) and Minimum number of dragonfly species are belong to family Gomphidae 11 (5.85%).

Table: 1. Family wise abundance

S.NO	Family	Specimens and Abundance
1	Libellulidae	177 (94.15%)
2	Gomphidae	11 (5.85%)

Most abundant genera is Orthetrum (87n) (46.28%), Tremea (23n) (12.23%), Pantala (19n) (10.11%), Trithemis (17n) (9.04%), Acisoma (16n) (8.51%) and the minimum number of dragonfly genera is Ictinogomphus (11n) (5.85%) and followed by Crocothemis (15n) (7.98%).

Table: 2. Genera wise distribution

S. No	Genera	Specimen (n)
1	Orthetrum	87
2	Acisoma	16
3	Crocothemis	15
4	Tremea	23
5	Trithemis	17
6	Pantala	19
7	Ictinogomphus	11

*n show the number of individuals.

Table: 3. Number of dragonfly species (number of individual) collected from five localities during the present study from June to September 2014 at Tehsil Tangi District Charsadda Khyber Pakhtunlhwa Pakistan.

S. No	Locality	Species	No of Species	Total
1	Shodag	*Orthetrum Sabina*	1	33
		Orthetrum chrysis	11	
		Trithemis festiva	7	
		Orthetrum gluacum	5	
2	Haricha nd	*Orthetrum cancelatum cancelatum*	9	28
		Orthetrum gluacum	8	
		Orthetrum pruinosum	11	
3	Spalmai	*Orthetrum Sabina*	6	52
		Acisoma panrpoid panrpoid	5	
		Crocothemis servalia	11	
		Tramea basilaris	9	
		Trithemis festevia	9	
		Pantala flarenson	7	
		Ictinogomphus ferox	5	
4	River Jindi	*Orthetrum Sabina*	3	41
		Crocothemis servelia	6	
		Tramea basilaris	9	
		Trithemis festevia	7	
		Pantala flarenson	4	
		Orthetrum gluacum	6	
		Ictinogomphus ferox	6	
5	Shakoor	*Orthetrum gluacum*	11	34
		Orthetrum pruinosum	10	
		Orthetrum cancelatum	13	

Table number 3 show 4 different localities and their species abundance. The maximum species were reported from Spalmai 52 (27.66%) and followed by River Jindi 41 (21.81%), Shakor 34 (18.09%) and Shodag 33 (17.55%) and minimum number of species were examined from Harichand 28 (14.89%).

Table 4: Morphometric examination of the collected species their wing span and their body length.

S. No	Species	Fore wing (mm) (M.D±S.D)	Hind wing (mm) (M.D±S.D)	Body length (M.D±S.D)
1	*Orthetrum sabina*	12.5±0.2	13±1.4	17.5±0.2
2	*Crocothemis servalia*	12±1.7	11.5±0.2	15±0.5
3	*Acisoma panrpoid panrpoid*	8.5±0.7	7.5±0.5	10.5±1
4	*Tramea basilaris*	11±0.5	10.5±1.6	13±0.5
5	*Orthetrum gluacum*	12.5±1	12±1.5	17.5±1.0
6	*Trithemis festevia*	10±2.0	11±1.2	13±0.7
7	*Orthetrum chrysis*	13±1.5	12.5±0.5	16.5±1.3
8	*Orthetrum pruinosum*	15±0.5	14.5±0.7	18±0.2
9	*Pantala flarenson*	11.5±0.2	10±1.3	13.5±1.5
10	*Ictinogomphus ferox*	17.5±0.4	16±2.0	26.5±0.5
11	*Orthetrum cancellatum cancellatum*	14±0.8	13.8±0.9	18.2±0.8

The wing span (Fore wing and Hind wing) and body length of the reported species is show that the *Ictinogomphus ferox* (26.5±0.5 B.L mm) (17.5±0.4 Fore W.S mm) (16±2.0 Hind W.S mm) and *Orthetrum cancellatum cancellatum* (18.2±0.8 B.L mm) (14±0.8 Fore W.S mm) (13.8±0.9 Hind W.S mm), *Orthetrum pruinosum* (18±0.2 B.L mm) (11.5±0.2 Fore W.S mm) (14.5±0.7 Hind W.S mm) followed by *Orthetrum gluacum* (17.5±1.0 B.L mm) (12.5±1 Fore W.S mm) (12±1.5 Hind W.S mm) and *Orthetrum sabina* (17.5±0.2 B.L mm) (12.5±0.2 Fore W.S mm) (13±1.4 Hind W.S mm) and the minimum species by length are *Acisoma panrpoid panrpoid* (10.5±1 B.L mm) (8.5±0.7 Fore W.S mm) (7.5±0.5 Hind W.S mm) and followed by *Tramea basilaris* (13±0.5 B.L mm) (11±0.5 Fore W.S) (11±1.2 Hind W.S mm).

6. Discussions

Khaliq (1990) [8] reported 19 species from Poonch District of Azad Jammu and Kashmir, Pakistan. Ahmad (1994) [9] identified 3 new genera and 4 species of Anisoptra from Khyber Pakhtunkhwa. The similar survey were also conducted from Tehsil Tangi District Charsadda Khyber Pakhtunkhwa Pakistan. This has been showed the large similarity in both study areas. Ullah (1994) [10] recorded 122 species of dragonfly belonging to 10 genera and 2 families from Sindh. Rahman (1994) [11] analyzed 35 dragonfly species belonging to 22 genera of 12 subfamilies in 3 families from Punjab. The similar species were also recorded from Tehsil Tangi District Charsadda Khyber Pakhtunkhwa Pakistan. Fulan *et al.,* (2010) [12] examined total of 17 dragonfly species (11 Zygoptera and ten Anisoptera) representing six families were recorded at 21 sites. He recorded in 1999 a total of 174 individuals representing 11 species (six Anisoptera species and Zygoptera species). *I. graellsi*, *C. caerulescens* and *L. viridis* were the most abundant dragonfly species in 1999. He recorded in 2003 a total of 165 individual's representing11 species (six Anisoptera species and Zygoptera species). The dragonfly species that were most abundant in 2003 were *I. graellsi*, *L. viridis* and *P. genei*. The present survey 11 species were recorded from small study areas.

Rathod *et al.,* (2012) [13] recorded total of 31 species belonging to 6 families namely Libellulidae, Coenagrionidae, Gomophidae, Lestidae Aeshnidae and Platycnemididae. In present survey only 2 families were recorded which show great difference between both areas. Simaika *et al.,* (2013) [14] examined total, of dragonflies 19.7% (431 of the 2185)of the currently recognized protected areas in Africa, representing 82.2% (564 of 686) of the dragonfly species overall, of globally threatened species 72% (43 of 60 species) were recorded at least once in a protected area. Only 58% (7/12) critically endangered and 60% (8/13) endangered dragonfly species are found in formally protected areas, whereas 80% (28/35) of species listed as vulnerable occur in protected areas. From both study areas the similar species were recorded family Libellulidae significantly higher than family Gomophidae. Further study evaluates the dragonfly fauna of Tehsil Tangi District Charsadda Khyber Pakhtunkhwa Pakistan.

7. Conclusion and Recommendation

It is concluded that the exploring of dragonfly is found in Tehsil Tangi District Charsadda during June to September 2014. Collected specimens are O*rthetrum cancellatum, Orthetrum pruinosum negleitum, Orthetrum Sabina, Pantala flavescence, Trithemis festevia, Tramea basilaris, Crocothemis servalia, Acisoma panorpoid panorpoid, Orthetrum gluacum Orthetrum chrysis* and *Ictinogomphus ferox*. These family Libellulidae is abundant and followed by Gomphidae. The most abundant Genera is Orthetrum and least number of Genera is Ictinogomphus. Similar survey should be conducted on large scales to fully evaluate the predatory dragonfly fauna of District Charsadda, KP, Pakistan.

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