UNIVERSITY OF SINDH JOURNAL OF ANIMAL SCIENCES
Vol. 2, Issue 4, Pp: (20-25), December, 2018
Email: editor.usjas@usindh.edu.pk
Website: http://sujo2.usindh.edu.pk/index.php/USJAS
ISSN (P): 2521-8328
ISSN (E): 2523-6067
Published by University of Sindh, Jamshoro
(USJAS)

MORPHOMETRIC STUDY OF DRAGONFLIES INHABITING IN DISTRICT MATIARI SINDH

Jaweria Shaikh, Naheed Baloch, Barkat Ali Bughio, Afshan Ashfaque Ahmed and Sidra-tul-Muntha

Department of Zoology, University of Sindh, Jamshoro, Pakistan

ARTICLE INFORMATION

Article History:
Received: 20th Dec 2018
Accepted: 4th April 2019
Published online: 5th July 2019

Author's contribution
JS collected the samples, NB designed the study, BAB taxonomically verified the data, AAA revised the draft & SM submitted the article.

Key words:
Morphometric, talukas, dragonflies, inhabited, transmutations

ABSTRACT

Research article should aim to observed morphometric study of dragonflies which inhabited in district Matiari. During study period many surveys were conducted from 02 talukas included (Saeedabad and Hala) district Matiari is an extravagant amount of minute district of Sindh that's why it is withal included in taluka as well. Survey were commenced from monsoon season which is commences from August up to mid of September. During survey total 381 specimens comprising 213 males and 168 females were amassed. All specimens exhibiting some key transmutations in their morphological description.

1. INTRODUCTION

Dragonflies are flying insects of the order Odonata. There are about 5,300 species of dragonfly. The adults victual other flying insects. Dragonflies have immensely colossal compound ocular perceivers, which is their main sense organ. They have four vigorous transparent wings, and a long body. Dragonflies are customarily found around lakes, ponds, streams and wetlands. They are predators which victual mosquitoes, and other minute insects such as flies, bees, ants, and butterflies. Their larvae, kenned as 'nymphs', are aquatic [1] Dragonflies have been around for 300 million years. In the Carboniferous period, some species had wingspans of over 2 ft 61 cm [2]. Identifying males and females is not arduous. Males will have what appears to be a pouch on the second and third abdominal segments that contains secondary genitalia. The genuine male genitalia are found on the last abdominal segments along with a grasping structure used to hold the female while mating.

Corresponding Author: nbbaloch12@yahoo.com

The male engenders sperm at the tip of the abdomen and transfers this sperm to the secondary genitalia where the female will have access to it. Females do not have secondary genitalia or grasping structures at the terminus of the abdomen but instead have a single genital opening and a diminutive ovipositor at the terminus of the abdomen that will be acclimated to oviposit her eggs (optically discern above for types of oviposition). Mundanely, the male dragonfly is more colorful while the female will be a dull brown or grey. This is erroneous for all odonates. For example, both sexes of Calopteryxmaculata are very kindred in coloration with the exception of the female having a white pterostigma while the male does not [3]. When odonates mate they compose what is called a "mating wheel." The wheel is composed when the male grasps the female abaft the head and the female raises the tip of her abdomen forward to come in contact with the secondary genitalia of the male. Odonates can often be visually perceived flying in tandem in this fashion [4]. An adult dragonfly has three distinct segments, the head, thorax, and abdomen as in all insects. It has a chitinous exoskeleton of hard plates cohered with flexible membranes. The head is sizably voluminous with very short antennae. It is dominated by the two compound

ocular perceivers, which cover most of its surface. The compound ocular perceivers are composed of ommatidia, the numbers being more preponderant in the more sizably voluminous species. Aeshnainterrupta has 22650 ommatidia of two varying sizes, 4500 being immensely colossal. The facets facing downward incline to be more minute. Petaluragigantea has 23890 ommatidia of just one size. These facets provide consummate vision in the frontal hemisphere of the dragonfly [5]. The compound ocular perceivers meet at the top of the head (except in the Petaluridae and Gomphidae, as withal in the genus Epiophlebia). Additionally, they have three simple ocular perceivers or ocelli. The mouthparts are habituated for biting with a toothed jaw; the flap-like labrum, at the front of the mouth, can be shot rapidly forward to catch prey [6]. The head has a system for locking it in place that consists of muscles and minute hairs on the back of the head that grip structures on the front of the first thoracic segment [7].

2. MATERIALS AND METHODS

Dragonflies were amassed from the Matiari district, after getting collection of particular specimens brought them to laboratory further studies were carried out on the advance entomology Laboratory of University of Sindh, Jamshoro.Dragonflies were amassed through the insect net which has two type's aerial net and sweep net.

Method for killing and preservation

The specimens were brought into the advance entomology lab and killed into chloroform then pinned and stretched on the stretching board and attention was paid to the antennae, wings and legs in order to exhibit paramount taxonomic characters then the dried specimens were preserved in the insect box then identification was carried out under the stereoscopic binocular microscope.

3. RESULTS AND DISCUSSION

Generally Dragonfly has two astronomically immense compound ocular perceivers which take up most of its head. Dragonflies have long, delicate, membranous wings which are transparent and some have light yellow colouring near the tips. Their bodies are long and tenuous and they have a short antennae. Dragonflies are very colorful for example the Green Darner Dargonfly has a green thorax and a blue segmented abdomen. Some are red like the Comet Darner and yellow like the Emerald Darner. Dragonflies breath through spiracles which are diminutive apertures located on their abdomen. They can beat each pair of wings together or discretely and their rear wings can be out of phase with the front wing. Dragonflies have perplexed neck muscles which sanction them to tilt their head sideways 180 degrees, back 70 degrees and down 40 degrees. Material were sort out into 03 species their diagnostic characteristics are under as follow:

Description of species:

01. *Bradinopyga geminate* **(Rambur 1842) (Granite ghost):**

Identification:

Head is ebony in colour, ocular perceivers is brown in colour, thorax is ebony in colour, abdomen is ebony with white spots, Segment of abdomen is 1st to 3rd are short and 4th to 6th are long and 7th to 10th segment are short.Cerci are white in colour and cessation of the tip have the ebony spine and bristle are on the cerci. While female'sEyes are brown in color. Thorax are brown, ebony and dirty white color. Wings are transparent and pterostigma are brown and cream color. Abdomen are brown and dirty white with ebony elongated spots. Cerci are cream in color.

02. *Chrocothemis servilia* **(Drury 1773) (Scarlet skimmer):**

Identification:

Mouthpart are reddish in color. Ocular perceivers are brown in color. Thorax are light brown and orange in color. Legs are light brown and orange in color. Wings are transparent and pterostigma are light brown with ebony outline. Reddish brown abdomen, an ebony dorsal line running from 1st abdominal segment to the last segment. Cerci are red in color.

03. *Orthetrum sabina* **(Drury 1770) (Tenuous skimmer):**

Identification:

Ocular perceivers are tenebrous green in color. Thorax are light green and ebony in color. Pterostigma are light brown in color with ebony outline. Legs are green and brown in color. Abdomen are green and ebony and segment 7to10 are thoroughly ebony and anal appendages are white. While female's ocular perceivers are brown in color. Thorax have Light green with light brown lines. Coloration of Legs are green and brown in color. Abdomen are light green and dark brown in color. Anal appendages are white and hair.

Male

Female

Figure.1. *Bradinopyga geminate* male and female.

Male

Female

Figure.2. *ChrocothemisServilia* male and female

.

Male

Female

Figure.3. *Orthetrum sabina* male and female.

Figure no 01 is showing *Bradinopyga geminata*male and female and cerci of male and female species. Figure no 02 showing *ChrocothemisServilia* male and female and their cerci. Figure no 03 is showing *Orthetrum Sabina*male and female and their cerci. Circles on figures are showing cerci of males and females specimens. Table no 01 showing complete Mean and Standard derivation body parameters of *Bradinopyga geminata* 2018Mean of length of antennae in male is 3.04 S.D is 0.027 Mean of length of antennae in female is 3.03 S.D is 0.017 Mean of length of head in male is 5.74 and S.D is 0.024Mean of length of head in female is 6.12 and S.D is 0.047 Mean width of head in male is 7.15 and S.D is 0.023 Mean width of head in male is 7.34 and S.D is 0.022 Mean of length of pronotum in male 9.25 and S.D is 0.027 Mean of length of pronotum in female is 9.45 and S.D is 0.026 Mean of weight of pronotum in male is 6.35 and S.D is 0.029Mean of weight of pronotum in female is 6.35 and S.D is 0.029Mean of length of abdomen in male is 28.45 S.D is 0.025 Mean of length of abdomen in female is 29.65 S.D is 0.026 Mean of length of femur in male is 7.04 S.D is 0.024 Mean of length of femur in female is 8.05 S.D is 0.027 Mean of length of tibia in male is 4.74 S.D is 0.027Mean of length of tibia in female is 5.19 S.D is 0.041 Mean of length of forewing in male is 32.65 and S.D is 0.027 Mean of length of forewing in female is 36.54 and S.D is 0.027 Mean of length of hindwing in male is 30.24 and S.D is 0.027 Mean of length of hindwingin female is 34.65 and S.D is 0.027Mean of length of body in male is 41.45 and S.D is 0.024 Mean of length of body in male is 44.55 and S.D is 0.028.

Table no 02 showing complete Mean and Standard derivation body parameters of *ChrocothemisServilia* 2018Mean of length of antennae in male is 4.01 S.D is 0.007 Mean of length of antennae in female is 3.02 S.D is 0.011 Mean of length of head in male is 5.03 and S.D is 0.008Mean of length of head in female is 5.93 and S.D is 0.041 Mean width of head in male is 5.03 and S.D is 0.008 Mean width of head in female is 4.12 and S.D is 1.314 Mean of length of pronotum in male 8.11 and S.D is 0.009 Mean of length of pronotum in female is 8.51 and S.D is 0.008 Mean of weight of pronotum in male is 4.59 and S.D is 0.0012 Mean of weight of pronotum in female is 5.64 and S.D is 0.020 Mean of length of abdomen in male is 23.04 S.D is 0.012 Mean of length of abdomen in female is 20.37 S.D is 0.018 Mean of length of femur in male is 5.19 S.D is 0.011 Mean of length of femur in female is 4.61 S.D is 0.008 Mean of length of tibia in male is 5.58 S.D is 0.010 Mean of length of tibia in female is 4.64 S.D is 0.023 Mean of length of forewing in male is 28.51 and S.D is 0.009 Mean of length of forewing in female is 27.01 and S.D is 0.004 Mean of length of hindwingin male is 27.09 and S.D is 0.009 Mean of length of hindwing in female is 27.01 and S.D is 0.004Mean of length of body in male is 36.30 and S.D is 0.012 Mean of length of body in male is 33.57 and S.D is 0.020.

Table no 03 showing complete Mean and Standard derivation body parameters of *Orthetrum Sabina*2018Mean of length of antennae in male is 2.34 S.D is 0.027 Mean of length of antennae in female is 2.34 S.D is 0.027 Mean of length of head in male is 4.62 and S.D is 0.026Mean of length of head in female is 5.08 and S.D is 0.034 Mean width of head in male is 5.37 and S.D is 0.033 Mean width of head in female is 5.68 and S.D is 0.038 Mean of length of pronotum in male 8.03 and S.D is 0.021 Mean of length of pronotum in female is 9.26 and S.D is 0.034 Mean of weight of pronotum in male is 4.71 and S.D is 0.037 Mean of weight of pronotum in female is 5.18 and S.D is 0.035 Mean of length of abdomen in male is 29.46 S.D is 0.033 Mean of length of abdomen in female is 33.11 S.D is 0.042 Mean oflength of femur in male is 5.48 S.D is 0.052 Mean of length of femur in female is 7.88 S.D is 0.042 Mean of length of tibia in male is 4.26 S.D is 0.037 Mean of length of tibia in female is 6.27 S.D is 0.032 Mean of length of forewing in male is 26.70 and S.D is 0.063 Mean of length of forewing in female is 30.63 and S.D is 0.034 Mean of length of hindwingin male is 28.02 and S.D is 0.013 Mean of length of hindwing in female is 31.40 and S.D is 0.030Mean of length of body in male is 42.04 and S.D is 0.024 Mean of length of body in male is 43.79 and S.D is 0.033.

4. CONCLUSION

Dragonflies are known as most beautiful and abundant species recorded in world on level of food chain they are one of most important predator as well as according to morphology they are known as most beautiful creature of ALLAH ALMIGHTY. This Research article should aim to observed morphometric study of dragonflies which were inhabiting in district Matiari. During study period many surveys were conducted from 02 talukas included (Saeedabad and Hala) district Matiari is an extravagant amount of minute district of Sindh that's why it is withal included in taluka as well. Survey were commenced from monsoon season which is commences from August upto mid of September. During survey total 381 specimens comprising 213 males and 168 females were amassed. All specimens exhibiting some key transmutations in their morphological description.

5. REFERENCES:

[1] Barnes, Robert D. 1982. *Invertebrate Zoology*. Philadelphia, PA: Holt Saunders. ISBN 0-03-056747-5.

[2] Dragonflies, Wisconsin's aerial acrobats". www.dnr.state.wi.us. Retrieved 2008-07-22.

[3] Daigle JJ. 1991. Florida damselflies (Zygoptera): A species key to the aquatic larval stages. State of Florida Department of Environmental Regulation. Technical Series. Vol. 11, Num. 1.

[4] Daigle JJ. 1992. Florida dragonflies (Anisoptera): A species kKey to the aquatic larval stages. State of Florida Department of Environmental Regulation. Technical Series. Vol. 12, Num. 1.

[5] "Introduction to the Odonata". UCMP Berkeley. Retrieved 24 February 2015.

[6] Pritchard, Gordon (1966). "On the morphology of the compound eyes of dragonflies (Odonata: Anisoptera), with special reference to their role in prey capture". Proceedings of the Royal Entomological Society of London. **41** (1–3): 1–8. doi:10.1111/j.1365-3032.1966.tb01126.x.

[7] Suhling, F.; Sahlén, G.; Gorb, S.; Kalkman, V.J.; Dijkstra, K-D.B.; van Tol, J. (2015). "Order Odonata". In Thorp, James; Rogers, D. Christopher. *Ecology and general biology. Thorp and Covich's Freshwater Invertebrates* (4 ed.). Academic Press. pp. 893–932. ISBN 9780123850263

Table # 01 showing body parameters of *Bradinopyga geminata* 2018.

Body parameters	No. of Males=40		No of Female=20	
	Mean	S.D	Mean	S.D
Length of antennae	3.04	0.027	3.03	0.017
Length of head	5.74	0.024	6.12	0.047
Width of head	7.15	0.023	7.34	0.022
Length of pronotum	9.25	0.027	9.45	0.026
Width of pronotum	6.35	0.029	6.55	0.028
Length of abdomen	28.45	0.025	29.65	0.026
Length of femur	7.04	0.024	8.05	0.027
Length of tibia	4.74	0.027	5.19	0.041
Length of forewing	32.65	0.027	36.54	0.027
Length of hindwing	30.24	0.027	34.65	0.027
Total body length	41.45	0.024	44.55	0.028

Material examined: District Matiari 40male, 20 female from Hala and Saeedabad

Table # 02 Showing body parameters of *Chrocothemis servilia* 2018.

Body parameters	No of Males=90		No of Female=78	
	Mean	S.D	Mean	S.D
Length of antennae	4.01	0.007	3.02	0.011
Length of head	5.03	0.008	5.93	0.014
Width of head	5.03	0.008	4.12	1.314
Length of pronotum	8.11	0.009	8.51	0.008
Width of pronotum	4.59	0.012	5.64	0.020
Length of abdomen	23.04	0.012	20.37	0.018
Length of femur	5.19	0.011	4.61	0.008
Length of tibia	5.58	0.010	4.64	0.023
Length of forewing	28.51	0.009	27.01	0.004
Length of hindwing	27.09	0.009	26.15	0.026
Total body length	36.30	0.012	33.57	0.020

Material examined: District Matiari 90male, 78 female from Hala and Saeedabad

Table # 03 showing body parameters of *Orthetrum sabina* 2018.

Body parameters	No of Males= 83		No of Female= 70	
	Mean	S.D	Mean	S.D
Length of antennae	2.34	0.027	2.34	0.027
Length of head	4.62	0.026	5.08	0.034
Width of head	5.37	0.033	5.68	0.038
Length of pronotum	8.03	0.021	9.26	0.034
Width of pronotum	4.71	0.044	5.18	0.035
Length of abdomen	29.46	0.033	33.11	0.042
Length of femur	5.48	0.052	7.88	0.042
Length of tibia	4.26	0.037	6.27	0.032
Length of forewing	26.70	0.063	30.63	0.034
Length of hindwing	28.02	0.013	31.40	0.030
Total body length	42.04	0.024	43.79	0.033

Material examined: District Matiari 83 male, 70 female from Hala and Saeedabad