Cibtech Journal of Zoology ISSN: 2319–3883 (Online)
An Open Access, Online International Journal Available at http://www.cibtech.org/cjz.htm
2014 Vol. 3 (2) May-August, pp. 55-59/Bhagat
Research Article

SYSTEMATIC INVENTORY AND DIVERSITY OF CRANEFLY-FAUNA (INSECTA) OF JAMMU AND KASHMIR STATE (INDIA)

***R. C. Bhagat**
P.O. Box No. 1250, G.P.O., Residency Road, Srinagar, Kashmir-190001, J and K, India
**Author for Correspondence*

ABSTRACT

This paper deals with cranefly-fauna (Nematocera: Tipuloidea) of diverse areas of Jammu and Kashmir State. In this region of zoo-geographical significance, a total of 60 species of cranefly, distributed over 22 genera are known to occur. These species pertain to three main families, *viz*. Limoniidae, Pediciidae and Tipulidae. Limoniidae is found to be dominant family, incorporated a total of 36 species of 17 genera, followed by family Tipulidae, including 19 species, under 4 genera. The family Pediciidae is represented by 5 species belonging to single genus, *Dicranota*. Tipulid genus, *Tipula* is species- rich, having 11 species. An up-to-date systematic Inventory of valid species and sub-species, has been provided.

Keywords: *Craneflies, Inventory, Diversity, Jammu and Kashmir State (India)*

INTRODUCTION

Craneflies are commonly known as mosquito hawk, gallynapper or daddy long legs, belonging to order Diptera, suborder Nematocera, Infra-order Tipulomorpha, super-family Tipuloidea. The Tipuloidea of Jammu and Kashmir State of Indian subcontinent include three main families, *viz*. Limoniidae, Pediciidae and Tipulidae. Tipuloids are holometabolous insects, with four stages of life history, egg, larva, pupa and adult. The adult craneflies are terrestrial, semi-terrestrial, whereas immature stages in most of species as aquatic and semi-aquatic.

The adult tipuloids are small (2mm) to large with length upto 40 mm (*Holorusia*). The body of adult is slender, with long fragile legs and long wings. The thorax in adult has characteristic v-shaped transverse mesonotal suture. The larvae are detritus feeders, commonly known as leatherjackets, showing hemicephalus retractile head capsule. Limoniids usually fold wings along the back of body when at rest, whereas tipulids hold them out at right angle. Pediciids are also known as hairy-eyed craneflies.

The Cranefly species serve as source of food for other animals like fishes, amphibians, birds and mammals, besides arthopods. Few species are also pests damaging roots and seedlings of crops. Tipulid larvae are component in aquatic biomonitoring- as a group they are considered sensitive to moderately sensitive to human perturbations (e.g., rating 3 on 1- 10 scale in Hilsenhoff index) (de Jong *et al*., 2008). The Tipuloidea is known by 17645, currently recognized valid species and subspecies, reported from different parts of the world (Oosterbroek, 2014). A total of more than 1475 valid species and subspecies are known from Indian region (Naskar *et al*., 2013).

The database presented in the present paper pertains to 60 species of craneflies (Tipuloidea), occurring in diverse areas of Jammu, Kashmir and Ladakh Himalayan regions. These regions of great zoo-geographical significance are geographically different and climatically distinct. Jammu region as subtropical, Kashmir (temperate) and Ladakh (cold desert). An attempt has been made to consolidate information on the Tipuloidea of Jammu and Kashmir State, with updated faunal inventory/ checklist and diversity. The references of authors, reporting, describing and synonymising the taxa, are given as reference code numbers in the long brackets, in front of each listed valid species/ sub-species. The keys to these code numbers are given at the end of the systematic inventory. The latest information on the systematics/nomenclature of taxa has been followed as provided by Oosterboaek (2014), in his authoritative online database on craneflies of the world.

RESULTS AND DISCUSSION

Systematic Inventory

Order: Diptera
Suborder: Nematocera
Infra-order: Tipulomorpha
Superfamily: Tipuloidea

Family 1: Limoniidae
Subfamily 1: Chioneinae
1. *Baeoura primaeva* (Alexander) [9, 22]
2. *Cheilotrichia* (*Empeda*) *microdonta* Alexander [9, 22]
3. *Cheilotrichia* (*Empeda*) *tytthos* Alexander [7]
4. *Erioptera* (*Erioptera*) *palliclavata* Alexander [4, 17]
5. *Erioptera* (Unplaced) *rhadinostyla* Alexander [9]
6. *Hoplolabis* (*Parilisia*) *multiserrata* (Alexander) [9, 17]
7. *Idiocera* (*Euptilosterna*) *reticulata* (Alexander) [4]
8. *Idiocera* (*Idiocera*) *displosa* (Alexander) [8]
9. *Idiocera* (*Idiocera*) *pergracilis* (Alexander) [8]
10. *Idiocera* (*Idiocera*) *phaeosoma* (Alexander) [8]
11. *Idiocera* (*Idiocera*) *phallostena* (Alexander) [8]
12. *Ormosia* (*Oreophila*) *hutchinsoni* Alexander [2]
13. *Ormosia* (*Oreophila*) *licinia* Alexander [14]
14. *Ormosia* (*Ormosia*) *kashmiri* Alexander [13]
15. *Ormosia* (*Ormosia*) paxilla Alexander [9, 22]
16. *Rhabdomastix* (*Rhabdomastix*) *emodicola* Alexander [9, 22]
17. *Styringomyia schmidiana* Alexander [9]
18. *Symplecta* (*Psiloconopa*) *diadexia* (Alexander) [14]

Subfamily 2: Limnophilinae
19. *Hexatoma* (*Eriocera*) *nepalensis* (Westwood) [16]
20. *Hexatoma* (*Hexatoma*) *schmidiana* Alexander [19]
21. *Pseudolimnophila* (*Pseudolimnophila*) *apicinigra* Alexander [4, 17]

Subfamily 3: Limnoiinae
22. *Dicranomyia* (*Dicranomyia*) *anata* (Alexander) [12, 22]
23. *Dicranomyia* (*Dicranomyia*) *autumnalis* (Staeger) [19, 4]
24. *Dicranomyia* (*Dicranomyia*) *dactylophora* Alexander [12, 22]
25. *Dicranomyia* (*Dicranomia*) *laticellula* (Alexander) [22]
26. *Dicranomyia* (*Dicranomyia*) *longipennis* (Schmmel) [22]
27. *Dicranomyia* (*Dicranomyia*) *neanata* (Alexander) [15, 17]
28. *Dicranomyia* (*Dicranomyia*) *pulchripennis* Brunetti [15, 18]
29. *Dicranomyia* (*Dicranomyia*) *tricuspidata* (Alexander) [4, 17]
30. *Dicranomyia* (*Melanolimonia*) *emodi* (Alexander) [10, 17]
31. *Helius* (*Helius*) *euryphallus* Alexander [10, 17]
32. *Limonia hostilis* Alexander [1]
33. *Limonia kashmirica* (Edwards) [1, 19, 20]
34. *Lipsothrix kashmirica* Alexander [2]
35. *Orimarga* (*Orimarga*) *basalis* Alexander [4]
36. *Rhipidia* (*Rhipidia*) *synspilota* (Alexander) [3]

Family 2: Pediciidae
Subfamily: Pediciinae
37. *Dicranota (Rhaphidolabis*) *obesistyla* Alexander [10, 17]
38. *Dicranot*a (*Rhaphidolabis*) *pallidthorax* Alexander [2]
39. *Dicranota* (*Rhaphidolabis*) *subsordida* Alexander [2]
40. *Dicranota* (*Rhaphidolabis*) *tumidosa* Alexander [10]
41. *Dicranota* (*Rhaphidolabis*) *uninebulosa* Alexander [2]

Family 3: Tipulidae
Sub-family: Tipulinae
42. *Holorusia cressida* (Alexander) [5, 17, 18]
43. *Nephrotoma irrevocata* Alexander [4, 17]
44. *Nephrotoma meraca* Alexander [4, 17]
45. *Nephrotoma subopaca* Alexander [6]
46. *Nephrotoma trilobulata* Alexander [17]
47. *Nigrotipula achlypoda* (Alexander) [14, 17]
48. *Nigrotipula bathroxantha* (Alexander) [11]
49. *Nigrotipula xanthocera* (Alexander) [4, 17]
50. *Tipula (Acutipula*) *irrequieta* Alexander [17]
51. *Tipula* (*Emodotipul*a) *submarmoratipennis* Alexander [17]
52. *Tipula* (*Lunatipula*) *hypovalvata* Alexander [17]
53. *Tipula* (*Lunatipula*) *trialbosignata* Alexander [17]
54. *Tipula (Platytipula*) *appendifera* Alexander [12]
55. *Tipula* (*Platytipula*) *indifferens* Alexander [2]
56. *Tipula* (*Platytipula*) *nigrocellula* Alexander [2]
57. *Tipula* (*Pterelachisus*) *icarus* Alexander [4]
58. *Tipula* (*Savtschenkia*) *baltistanica* Alexander [4, 21]
59. *Tipula (Sinotipula*) *hutchinsonae* Alexander [4]
60. *Tipula* (*Sinotipula*) *tessellatipennis* Brunetti [5, 18]

Key to code numbers, given above in the square brackets: 1=Alexander (1933); 2 = Alexander (1935 a); 3 = Alexander 1935 b); 4 = Alexander (1936); 5 =Alexander (1942); 6 = Alexander (1953); 7 = Alexander-(1956); 8= Alexander (1957 a); 9 = Alexander (1957 b); 10 = Alexander (1960); 11 = Alexander (1961); 12 = Alexander (1964); 13 = Alexander (1965); 14 = Alexander (1966); 15 = Alexander (1967); 16 = Alexander (1968); 17 = Alexander and Alexander (1973); 18 = Brunetti (1912)); 19= Edwards (1927); 20= Edwards (1928); 21= Oosterbroek (2009); 22 = Oosterbroek (2014).

Cranefly Diversity

In the light of above given systematic inventory, a total of 60 species of craneflies, belonging to super-family Tipuloidea, distributed over 22 genera, are known to occur in diverse areas of Jammu and Kashmir State. These species pertain to three main families, under various sub-families, *viz*. Limoniidae (subfamily Chioneinae, Limnophilinae and Limnoniinae), Pediciidae (Pediciinae) and Tipulidae (Tipulinae). The number of species (species richness) of various genera of superfamily Tipuloidea, belonging to different families / subfamilies, are presented in Table 1.

The Family Limoniidae incorporated a total of 36 species, under 17 genera, with subfamily Chioneinae having 18 species of 9 genera, Limnophilinae covering 3 spp. (2 genn) and Limnoniinae including 15 spp. (6 genn.). Limoniids are dominant component of the State and accounts for 60 % of the total cranefly-fauna (Tipuloidea) of this zoogeographic region of North-west Himalaya. In dominance, family Limoniidae is followed by family Tipulidae (subfamily Tipulinae), incorporated a total of 19 spp. under 4

genera and this accounts for 31.66 % of cranefly-fauna of the region. The family Pediciidae (Pediciinae) is represented by 5 spp. of 1 genus, accounts for 8.33 % of total Tipuloid- fauna.
The species-rich genus is found to be as *Tipula* (Tipulidae), having 11 species. This genus is followed by genus *Dicranomyia* (Limoniidae), with 9 species. Genus *Dicranota* (Pediciidae) and *Idiocera* (Limoniidae), with 5 spp. each. Limoniid- *Ormosia* and tipulid-Nephrotoma, having 4 species each. Tipulid, *Nigrotipula*, included 3 species. The Genera belonging to family Limoniidae, *viz. Cheilotrichia*, *Erioptera*, *Hexatoma* and *Limonia*, are having 2 species each. Rest of the 10 genera, pertaining to family Limoniidae and 1 genus under family Tipulidae, have been found to be having one species each (see table 1).

Table 1: Number of species (species richness) of various genera of craneflies, belonging to different families of Jammu and Kashmir State

Genera of Craneflies	Total Number of Species of Genera of Families and sub -families		
	Limoniidae	Pediciidae: Pediciinae	Tipulidae: Tipulidae:
Baeoura	01*	--	--
Cheilotrichia	02*	--	--
Dicranomyia	09***	--	--
Dicranota	--	05	--
Erioptera	02**	--	--
Helius	01***	--	--
Hexatoma	02**	--	--
Holorusia	--	--	01
Hoplolabia	01*	--	--
Idiocera	05*	--	--
Limonia	02***	--	--
Lipsothrix	01***	--	--
Nephrotoma	--	--	04
Nigrotipula	--	--	03
Orimarga	01***	--	--
Ormosia	04*	--	--
Pseudolimnophila	01**	--	--
Rhabdomastix	01*	--	--
Rhipidia	01***	--	--
Styringomyia	01*	--	--
Symplecta	01*	--	--
Symplecta	--	--	11

*Astrik mark (s) indicate sub-families of family Limoniidae: * = Sub-family Chioneinae;*
*** = Sub- family Limnophilinae and ***= Sub-family Limnoniinae*

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