

**Research Article**

**BIODIVERSITY AND SYSTEMATIC CHECKLIST OF NEUROPTERA  
(INSECTA: NEUROPTERIDA) OF JAMMU & KASHMIR STATE (INDIA)**

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**ABSTRACT**

The present paper deals with lacewing-fauna (Neuroptera) of Jammu and Kashmir State. An updated systematic checklist of 11 species of lacewings, belonging to 8 genera, under 5 main families has been provided; the dominant family of order Neuroptera is Coniopterygidae, having 4 species, pertaining to 3 genera. Three species of Neuropterans show their prevalence in the high-altitude cold desert areas of Ladakh region. *Chrysoperla* spp. not only shows their wide distribution in J & K State, but also play important role in the suppression of natural populations of aphids and fruit pests.

**Key Words:** Neuropteran Insects, Checklist, Diversity, J&K

**INTRODUCTION**

Lacewings or netwinged insects belong to Super-order Neuropterida and order Neuroptera. The adults of these insects are soft-bodied, green or yellow green in colour and having large lateral compound eyes. The adults show the presence of four membranous wings (fore and hind pair), about the same size, with many veins. The adults of these insects feed on honey dew of homopterous insects and on pollen. The larvae of lacewings are specialized predators, having elongated mandibles, adapted for piercing and sucking. These are voracious eaters of eggs and immature stages of many soft-bodied insects. Lacewings play an important role in biological control of insects / pests in the fields.

A total of 11 species of neuropterans are known to occur in diverse areas and localities of Jammu & Kashmir State in western Himalayas, of great zoo-geographical significance. In the present paper, updated information is provided on the systematic position and nomenclatural change of lacewing-fauna, in the light of recent taxonomical changes. Besides, host-prey diversity of *Chrysoperla* spp. has been highlighted.

The synonymies of taxa, given in parentheses, are listed under valid species in the checklist. The references pertaining to authors reporting and describing the taxa, are in the form of code numbers in square brackets, given in front of the listed species of the checklist. For the purpose of updation of database, pertaining to taxonomical changes, the world online databases on lacewing, given by Oswald (2013), have been consulted.

**RESULTS AND DISCUSSION**

**Systematic Checklist**

Order: Neuroptera

Family 1: Ascalaphidae

Sub-family Ascalaphinae

Tribe Encyposini

1. *Ogcogasterkirbyi* vander Weele [6, 17]

2. *Ogcogastersegmentator* (Westwood) [6, 13]

Family 2: Chrysopidae

Sub-family Chrysopinae

Tribe Chrysopini

3. *Chrysoperlaaorestes* (Banks) [14]

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(=*Chrysopaorestes* Banks) [3]

4. *Chrysoperlacarnea* (Stephens) [7, 8]

(=*Chrysopacarnea* Stephens) [2, 4, 15]

Family 3: Coniopterygidae

Sub-family 1: Aleuropteryginae

Tribe Fontenelleini

5. *Helicoconiscsorbai* Sziraki [16]

Sub-family 2: Coniopteryginae

Tribe 1. Coniopterygini

6. *Coniopteryx* (*Xeroconiopteryx*) *latigonarcuata* Meinander [12]

(= *Coniopteryxlatigonarcuata* Meinander) [12]

Tribe 2. Conwentziini

7. *Hemisemidalisfulvipennis* Sziraki [16]

8. *Hemisemidalishreblayi* Sziraki [16]

Family 4: Hemerobiidae

Sub-family Megalominae

9. *Megalomussetosulus* (Walker) [6, 9]

Family 5: Myrmeleontidae

Sub-family Myrmeleontinae

Tribe 1. Dendroleontini

Sub-tribe Dendroleontina

10. *Epacanthaclisiscontinentalis* Esben- Petersen [5, 10]

Tribe 2. Myrmecaelurini

11. *Myrmecaeluruszigana* Aspöck, Aspöck & Holzel [1]

(=*Myrmecaeluruspunctulatus* Steven) [4, 11]

Key to above given code numbers, given in parentheses: 1= Aspöck *et al.*, (1980); 2= Bahaar and Bhat (2012); 3= Bhagat and Masoodi (1986); 4 =Chandra and Sidhu (2009); 5= Esben- Petersen (1935); 6 = Ghosh and Sen (1977); 7= Gupta and Bali (2003); 8 = Khan and Zaki (2008); 9= Kimmins (1935); 10 =Kriovkhatsky (1998); 11 = Mani and Singh (1962); 12= Meinander (1972); 13= Needham ; 14= Oswald (2013); 15 = Pawar and Parry (1989) ; 16 = Sziraki (1999); 17= Van der Weele (1908).

From the above given checklist, it is evident that a total 11 species of Neuropterans, belonging to 8 genera, under 5 main families are known to exist in the Jammu, Kashmir and Ladakh Himalayan region (North-west) of India. The dominant family Coniopterygidae incorporated 4 species, under genera *Helicoconis*, *Coniopteryx* and *Hemisemidalis*, having 1, 1, and 2 species respectively. The families, viz. Ascalaphidae, Chrysopidae and Myrmeleontidae, having 2 species each. Under the family Myrmeleontidae, the species belong to two different genera (*Epacanthaclisis*, *Myrmecaelurus*), whereas the rest of the two families (Ascalaphidae and Chrysopidae), incorporated one genus/ species each. Three high- altitude species of lacewings, viz. *Chrysoperlacarnea* (= *Chrysopacarnea*), *Myrmecaeluruszigana* (= *M. punctulatus*) and *Epacanthaclisiscontinentalis*, have been reported from cold arid desert areas of Ladakh.

### Biodiversity and Biological Control Potential of *Chrysoperla* spp.

In Jammu, Kashmir and Ladakh regions, *Chrysoperlacarnea* (= *Chrysopacarea*) and *Chrysoperlaorestes* (= *Chrysopaoresta*), have been found to be as efficient aphidophagous predators, besides preying upon pests of agriculture importance in diverse crop environment. Bhagat and Masoodi (1986), observed the larvae of *C. orestes* suppressing the natural populations of aphid pests (*Aphis gossypii*, *A. pomi*), European red mite (*Panonychus ulmi*), San Jose scale, *Diaspidiotus perniciosus* (= *Quadraspidotus perniciosus*) and *Drosichadalbergiae* (= *dalbergia*).

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Aphid pest (*Aphis fabaesolanella* Theobald) on *Euonymus japonicus* (Japanese spindle) is predated upon by *Chrysoperla carnea* in Kashmir region. *C. carnea* has been reported from Ladakh region as a natural enemy of fruit pests. In addition to this, *C. carnea*, is showing wide distribution in the rice fields of various districts of Kashmir, viz. Anantnag, Bandipore, Budgam, Kupwara, Srinagar (Pawar and Parry, 1989; Khan and Zaki, 2008; Bahaar and Bhat, 2012). Garden sorrel (*Rumex dentatus*) is observed to be as an attractant for *C. carnea* in upper hills of J & K State by Gupta and Bali (2003).

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