An Updated Checklist of Ichneumonid Parasites (Hymenoptera: Ichneumonidae) Associated with Insects/Insect Pests of Agricultural, Horticultural and Other Economically Important Plants in the Union Territory of Jammu & Kashmir

Deen Mohd. Bhat1*, Muzaffar Ahmad Sheikh1 and Sajad Ahmad Khan2

1Department of Zoology, Govt. Degree College Ganderbal, J&K-191201-India
2Department of Zoology, Baba Gulam Shah Badshah University, Rajouri, J&K- India

*Corresponding author

ABSTRACT

Based on the literature survey, the present work provides an updated checklist of Ichneumonidae parasites (Hymenoptera: Ichneumonidae) associated with insects/insect pests of Agricultural, horticultural and other economically important plants in Union territory of Jammu & Kashmir. The paper deals with as many as 46 species of such recorded parasites spread over 11 subfamilies and 29 genera of family Ichneumonidae. Moreover, the systematic information, pertaining to the host insect-host plant range and local distribution of these listed Ichneumonidae parasites, has also been provided in this work.

Keywords
Checklist, Ichneumonidae, Insect pests, Jammu & Kashmir

Introduction

The Ichneumonidae (Hymenoptera) are one of the most species-rich families of all organisms with an estimated 60,000 species in the world. According to Gauld, many authorities regard this figure as an underestimate. The family Ichneumonidae is currently split into 37 subfamilies, of which 24 have been recorded from the Afro tropical region. With such huge number of subfamilies, the classification of family Ichneumonidae has not reached a stable consensus. Ichneumonids are parasitoids of Lepidoptera, Hymenoptera, Diptera, Coleoptera and rarely spiders and other arthropod groups.

The ichneumonids are widely studied because they are important agents of biological control of many groups of insects, including some agricultural, horticultural, and forest pests and
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play an essential role in the normal functioning of most ecosystems. Ichneumonids have been used successfully as bio-control agents and given the largely undocumented fauna there is a huge potential for their utilization in managed bio-control programmes.

From Jammu and Kashmir region, no significant consolidated account vis-à-vis ichneumonid parasitoids and their known insect hosts has been published earlier, and whatever little information is available in this regard, is confined to some papers scattered in different papers, some of the prominent ones are: Ahmad and Dar, Bhagat, Bhat, Bhat and Bhagat, Bhagat and Bhat, Bhat and Bhat, Bhat et al., Cameron, Gupta, Gupta and Tikkar, Gupta and Narendran, Jamal and Zaki, Masoodi et al., Mittal et al., Rishi and Shah, and Zutshi.

Hence, there was a dire need to prepare an updated checklist and inventory of Ichneumonid parasites of this region covering their host-insect range and local distribution. The present document will provide some base line data that will enable ready reference and information, whenever required for standardization and future utilization of these parasitoids for bio-control programmes of this region. Apart from this, the present work will also enable conservation management decisions vis-a-vis Ichneumonidae parasitoids as bio control agents.

Materials and Methods

The present study brings together scattered information about Ichneumonidae parasites of insects/insect pests, reported on various kinds of agricultural, horticultural and other economically important plant species, from Jammu and Kashmir. The checklist presented here is mainly based on available literature rather than on extensive taxonomic studies. Based on the literature Survey, all the previously published available research papers, pertaining to ichneumonidae parasites of insects, from Jammu and Kashmir, were examined and the information obtained was documented.

The data base was generated with special reference to Ichneumonidae parasites, their host insect/insect pest and host plant ranges, followed by authors reporting them from J&K region. In order to generate such comprehensive database (pertaining to Ichneumonidae), apart from available research papers and catalogues, the other vital e-resources and abstracting services (particularly, CABI, NISCAIR, AGRI, Biological abstracts, Inflib net, etc.) were also consulted.

The arrangement of the subfamilies and genera of enlisted ichneumonid parasites has been provided alphabetically for convenience, and does not reflect phylogenetic relationships. The tribes and genera therein also are arranged in alphabetical order, largely according to the classification of Yu and Horstmann and Yu et al.,

Results and Discussion

Based on the literature survey, the present checklist was prepared which provides base line data of as many as 46 species of ichneumonid parasites of family Ichneumonidae of J&K, falling under 11 subfamilies and 29 genera (Table 1).

The data of said 46 secrecies of Ichneumonidae parasite is listed alphabetically below according to their sub family names, tribe name (wherever available), Genera and species, followed by insect-host of the parasite along with host-plant on which such parasite was recovered.
from the insect host. The check list is appended as under:

**Subfamily Banchinae wesmael, 1845**

Tribe banchini wesmael, 1845

Genus *Exetastes* Gravenhorst, 1829

*Exetastes fornicator* (Fabricius, 1781) (=Icheuomon fornicator)

Host Insect Pest: unknown insect and host plant species

Localities in J&K: Kashmir

References: Ahmad and Dar, 1978

**Subfamily: Campopleginae forster, 1869**

Genus *Campoletis* Forster, 1869

*Campoletis* sp. (=Anilastus sp.)

Host Insect Pest: (i). *Lymantria obfuscata* on plants, *Salix* spp. and *Populus* spp.; (ii.). *Trichoplusia ni* on plants, *Brassica o. var. acephala*, *B. o. var. capitata* and *B. o. var. gongylodea*; (iii). *Plusia signata* on *B. o. var. capitata* and *B. o. var. gongyloda*

Localities in J&K: Baramulla, Badgam, Pulwama, Srinagar, Kashmir.

References: Anonymous, 1970; Bhat, 2008; Bhat et al., 2009; Bhat et al., 2017; Bhat, 2018

**Campoletis chloridae** Uchidda

Host Insect Pest: (i). *Thysanaplusi orichalcea* on plants, *Alium cepa, Brassica rapa* and *Pisum sativum*; (ii). *Helicoverpa argmiega* on plants, *Alium cepa, Lycopersicon esculentum, Solanum tuberosum, soybeen, Brassica campestris var. toria, Brassica junea and Cicer arietinum*

Localities in J&K: Bandipora, Baramulla, Badgam, Ganderbal, Pulwama, Srinagar, Kashmir, Jammu

References: Thakue *et al.*, 1995; Gupta and Raj, 2003; Bhat, 2008; Bhat *et al.*, 2009 ; Bhat *et al.*, 2010; Bhat *et al.*, 2017; Bhat, 2018

Genus *Campoplex* Gravenhorst, 1829

*Campoplex longipes* Moley

Host Insect Pest: Unknown insect and host plant species

Localities in J&K: Kashmir

References: Ahmad and Dar, 1978

Genus *Casiaria* Holmgren, 1859

*Casinaria* sp. (=Horogenes sp.)

Host Insect Pest: *Plutella xylostella* (=Plutella maculipennis) on plant, *B. o. var. capitata*

Localities in J&K: Srinagar

References: Simmonds and Roy, 1960

Genus *Charops* Holmgren, 1859

*Charops bicolor* (Szépligeti, 1906)

Host Insect Pest: *Heliothis armigera* on plant, *Lycopersicon esculentum*

Localities in J&K: Badgam, Bandipora, Srinagar

References: Bhat *et al.*, 2009.

Genus *Diadegma* Forester, 1869
**Diadegma fenestrale** (Holmgren)
(=Diadegma fenestralis)

Host Insect Pest: (i). *Helicoverpa armigera* on plants, *Lycopersicon esculentum*; (ii). *Plutella xylostella* on plants, *Brassica campestris*, *B. o. var. acephala*, *B. o. var. botrytis*, *B. o. var. capitata*, *B. o. var. gongylodes*, *B. rapa* and *Raphanus sativus*

Localities in J&K: Anantnag, Bandipora, Baramulla, Badgam, Ganderbal, Pulwama, Srinagar.

References: Bhat, 2008; Bhat and Bhagat, 2008; Bhat *et al.*, 2009

**Diadegma semiclausum** (Hellen)

Host Insect Pest: (i). *H. armigera* on plants, *B. o. var. acephala*, *B. o. var. gongylodes*; (ii). *P. xylostella* on plants, *B. o. var. acephala*, *B. o. var. gongylodes*

Localities in J&K: Srinagar

References: Bhat, 2018

**Genus Eriborus** Forester, 1869

**Erioborus sp.**

Host Insect Pest: *Helicoverpa armigera* on plant, *L. esculentum*

Localities in J&K: Bad. Srinagar

References: Bhat *et al.*, 2009.

**Genus Hyposoter** Forester, 1869

**Hyposoter ebeninus** (Gravenhorst, 1829)

Host Insect Pest: (i). *Pieris brassicae* on plants, *Brassica campestris*, *B. o. var. acephala*, *B. o. var. botrytis*, *B. o. var. capitata*, *B. o. var. gongylodes* and *B. rapa* ; (ii). *Pieris rapae* on plants, *B. o. var. acephala*, *B. o. var. gongylodes*, *B. o. var. capitata*; (iii). *Pontia daplidice* on plants, *B. o. var. acephala*, *B. o. var. gongylodes*

Localities in J&K: Anantnag, Badgam, Baramulla, Srinagar, Pulwama, Ganderbal

References: Bhat and Bhagat, 2009; Bhat, 2010a; Bhat, 2017; Bhat, 2018

Subfamily cremastinae förster, 1869

**Genus Eucremastus**

**Eucremastus Szépligeti, 1905**
(= *Cephalobolus parvipes* Morley.)

Host Insect Pest: unknown insect and host plant species

Localities in J&K: Kashmir

References: Ahmad and Dar, 1978

**Genus Pristomerus** Curtis, 1836

**Pristomerus sp.**

Host Insect Pest: *Ostrinia kashmirica* on *Crisium sp.*

Local Distribution: Kashmir (Achabal, Lar)

References: Anonymous, 1970

**Pristomerus sulci** Mahd. and Kolu

Host Insect Pest: *Glyphodes pyloalis* on *Morus spp*

Local Distribution: Pampore (Pulwama)

References: Mittal *et al.*, (2011)
Subfamily cryptinae kirby, 1837
tribe hemigasterini

Genus *Ecthrus* Gravenhorst, 1829

*Ecthrus coracinas* Gupta 1978

Host Insect Pest: Coleopteran larvae (wood boring)

Local Distribution: Kashmir (Gulmarg)

References: Gupta, 1978

Subfamily diplazontinae viereck, 1918

Genus *Diplazon* Nees, 1819

*Diplazon laetatorius* (Fabricius, 1781)
(= *Basus lactatorius* (Moley) (=*Ichneumon lactatorius*)

Host Insect Pest: Unknown insect host and plant species

Local Distribution: Kashmir

References: Ahmad and Dar, 1978

Genus *Promethes* Förster, 1869

*Promethes albiventralis* Diller

Host Insect Pest: unknown insect and host plant species

Local Distribution: Ladakh

References: Diller 1984

Subfamily ichneuomoninae

Genus *Protichneumon*

*Protichneumon pisorius* (Linnaeus, 1758)

Subfamily pimplinae wesmael, 184

Tribe EPHIALTINI Hellén, 1915

Genus *Exeristes* Forster, 1869

*Exeristes roborator* (Fabricus, 1793)

Host Insect Pest: *Ostrinia kashmirica* (Pyralidae) on *Cirsium* sp. (=*Cricus* sp.)

Localities in J&K: Achaba (Anantnag), Lar (Ganderbal)

References: Anonymous, 1970

Genus *Scambus* Hartig, 1838

*Scambus (Ateleophadnus) aithomelus* Gupta and Tikkar

Host Insect Pest: *O. kashmirica* on *Crisum wallichii*

Localities in J&K: Srinagar

References: Gupta and Tikkar, 1967

*Scambus flavicrus* Gupta and Tikkar.1968

Host Insect Pest: *O. kashmirica* on *Crinus* sp. (=*Crinus* sp)

Localities in J&K: Achabal (Anantnag), Lar (Ganderbal)

References: Anonymous, 1970
**Scambus (S.) indicus** Gupta and Tikar, 1968

Host Insect Pest: larva of lepidopteran on unknown plant sp.

Localities in J&K: Kashmir (Gulmarg)

References: Gupta and Tikkar, 1967

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**Scambus (S.) kahmiricus** Gupta and Tikar, 1968

Host Insect Pest: Lepidopteran larvae on unknown plant species

Localities in J&K: Kashmir (Shopian)

References: Gupta and Tikkar, 1967

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**Scambus nursei** (Cameron)

Host Insect Pest: Lepidopteran and coleopteran larvae on unknown plant species

Localities in J&K: Kashmir.

References: Narayan and Lal, 1955

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**Scampus sp.**

Host Insect Pest: *Thusanaplusia orichalea* on *Phaseolus vulgaris* and *Rumex nepelensis*

Localities in J&K: Badgam, Ganderbal

References: Bhat *et al.*, 2010; Bhat, 2017. Tribe PIMPLINI Wesmael, 1845

Genus *Itoplectis* Forester, 1869

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**Itoplectis himalayensis** Gupta 1967

Host Insect Pest: *L. obfuscate* on plant, *Salix* spp. and *populus* spp.

Localities in J&K: Kashmir (Srinagar, Pahalgam), Jammu (Batote)

References: Gupta, 1967; Rishi and Shah, 1985.

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**Itoplectis nr. himalayensis**

Host Insect Pest: *Plutella xylostella* on *B. capitata*, *B. gongylodes*, *B. Campestris*

Localities in J&K: Kashmir -Badgam, Barmulla, Ganderbal and Srinagar.

References: Bhat and Bhagat, 2008

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**Itoplectis sp.**

Host Insect Pest: *Plutella xylostella* (=*Plutella maculipennis*) on plant, *B. o.var. capitata*

Localities in J&K: Kashmir (Srinagar)

References: Simmonds and Roy, 1960.

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**Itoplectis tibetensis perking**

Host Insect Pest: Lepidopterous pupae on herbaceous bushes along forest edge.

Local Distribution: Kashmir (Gulmarg)

References: Gupta, 1967

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*Genus Coccygomimus*

**Coccygomimus sp.**

Host Insect Pest: *Lamantria obfuscate* on unknown host plant species

Localities in J&K: Kashmir

References: Anonymous, 1970

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*Genus Pimpla* Fabricius, 1804
**Pimpla archica Zeltenh**

Host Insect Pest: unknown insect and host plant species

Localities in J&K: Kashmir.

References: Ahmad and Dar, 1978

**Pimpla alternans (=Itoplectis alternans)**

Host Insect Pest: unknown insect and host plant species

Localities in J&K: Kashmir.

References: Anonymous, 1970

**Pimpla sp. host insect pest: (i). L. obfuscate on salix spp. and poulus spp. (ii). pieris brassica on B.o.var. gongylodes**

Localities in J&K: Kashmir (Srinagar)

References: Anonymous, 1969, Masoodi et al., 1986, Zutshi, 1967, Bhat et al., 2010, Bhat, 2017.

Genus *Theronia* Holmgren, 1859

**Theronia atalantae atalantae**

Host Insect Pest: *L. obfusca* on *Salix* spp. and *Populus* spp.

Localities in J&K: Kashmir.

References: Anonymous, 1970, Rishi and shah, 1985; Masoodi et al., 1986 a

Genus *Paniscus* shuckard, 1840

**Paniscus montanes cameron**

Host Insect Pest: unknown insect and host plant species

Localities in J&K: Kashmir

References: Cameron 1906.

**Paniscus collaris moley**

Host Insect Pest: unknown insect and host plant species

Localities in J&K: Kashmir (Srinagar)

References: Ahmad and Dar, 1978.
**Paniscus kashmirensis cameron**
Host Insect Pest: unknown insect and host plant species
Localities in J&K: Kashmir
References: Cameron, 1906

**Subfamily poemeniinae narayanan and lal, 1953**
Tribe POEMENIINI Narayanan and Lal, 1953
Genus *Deuteroxorides* Viereck, 1914

**Deuteroxorides indicus gupta**
Host Insect Pest: Coleopteran larvae on hardwood coniferous tree)
Localities in J&K: Kashmir (Pahalgam)
References: Gupta, 1980
Genus *Podoschistus* Townes, 1957

**Podoschisthus scutellaris desingnes**
Host Insect Pest: larvae of wood boring coleopterans on coniferous trees
Localities in J&K: Kashmir.
References: Gupta, 1980
Genus *Poemenia* Holmgren, 1859

**Poemenia kashmirica gupta**
Host Insect Pest: Larva of coleopteran wood boring (Coniferous trees)
Localities in J&K: Kashmir (Pahalgam)
References: Gupta, 1980, Gupta, 1985.

**Subfamily tryphoninae shuckard, 1840**
Tribe EXENTERINI Förster, 1869
Genus *Eridolius* Förster, 1869

**Eridolius aithogaster Gupta**
Host Insect Pest: larvae of saw flies (Tetridinidae) on unknown plant
Localities in J&K: Kashmir (Pahalgam)
References: Gupta, 1991
Tribe Tryphonini Shuckard, 1840
Genus *Polyblastus* Hartig, 1837

**Polyblastus kashmerensis gupta**
Host Insect Pest: larvae of saw fly on unknown plant species
Localities in J&K: Kashmir (Pahalgam)
References: Gupta 1985 a

**Subfamily xoridinae shuckard, 1840**
Tribe Xoridini Shuckard, 1840
Genus *Xorides* Latreille, 1809

**Xorides (xorides) anthracinus gupta and chandra**
Host Insect Pest: unknown insect and host plant species
Localities in J&K: Kashmir (Pahalgam)
References: Gupta and Chandra, 1974.
Table 1 A list of reported number of subfamilies, genera and species of Ichneumonidae from J&K

| S. No. | Name of Subfamily | No. of Genera | No. of species |
|--------|-------------------|---------------|---------------|
| 1      | Banchinae         | 1             | 1             |
| 2      | Campopleginae     | 7             | 9             |
| 3      | Cremastinae       | 2             | 3             |
| 4      | Cryptinae         | 1             | 1             |
| 5      | Diplazontinae     | 2             | 2             |
| 6      | Ichneuomoninae    | 1             | 1             |
| 7      | Pimplinae         | 8             | 19            |
| 8      | Ophioninae        | 1             | 3             |
| 9      | Poemeniinae       | 3             | 3             |
| 10     | Tryphoninae       | 2             | 2             |
| 11     | Xoridinae         | 1             | 2             |
| **Total** |                  | **29**        | **46**        |

Xorides (X.) minimus gupta and chandra

Host Insect Pest: unknown insect and host plant species

Localities in J&K: Kashmir (Gulmarg)

References: Gupta and Chandra, 1974

Others

Unidentified ichneuomonid

Host Insect Pest: Parnara guttata (Bremer and Grey) on Oryza sativa

Localities in J&K: Kashmir.

References: Jamal and Zaki, 2008

Unidentified ichneuomonid

Host Insect Pest: pupa of Thysanoplusia orichalcea on B. o. var. gongylodes, P. vulgaris and R. nepalensis

Localities in J&K: Ganderbal, Badgam, Baramulla, Pulwama, Ganderbal, Srinagar

References: Bhat et al., 2010.

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