

NEW DISTRIBUTIONAL RECORDS OF PTEROMALIDAE (HYMENOPTERA: CHALCIDOIDEA) FROM LADAKH, INDIA.

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INTRODUCTION

Ladakh region of the Trans-Himalaya is characterized by its peculiar topography, harsh climatic conditions and is usually referred as 'cold desert'. The fauna of the region is very distinct and unique due to its location being at the confluence of two of the world's Zoogeographical Regions i.e. the Palearctic and the Oriental. High levels of endemism and species richness occur in the area and Palearctic elements dominate in the fauna of the Region (Mani 1974). Based on the collections obtained during a rapid assessment survey of faunal resources conducted in Ladakh from July to September 2008, two species of Torymidae (Hymenoptera: Chalcidoidea) viz. *Megastigmus kashmiricus* Sureshan and *Ecdamua lehensis* Sureshan, were described as new to science, earlier from the area (Sureshan, 2009, Sureshan, 2010). In continuation of the above studies, in the present communication ten species of Pteromalidae (Hymenoptera: Chalcidoidea) are being reported from Ladakh. The present collections were made from the north eastern and south eastern parts of the Ladakh, comprising the Ladakh range, Nubra Valley and Changthang valley, using an insect net and aspirator. The specimens are deposited in the Gangetic Plains Regional Centre, Zoological Survey of India, Patna.

The classification by Boucek (1988) is followed in this paper and for the distributional records of the species Noyes (2003) is referred to. Following abbreviations are used in the text: F - Female; M - Male, MV - Marginal vein; OOL - Ocellocular distance; PMV - Postmarginal vein; POL - Postocellar distance; STV - Stigmal vein.

SYSTEMATIC ACCOUNT

Order HYMENOPTERA

Superfamily CHALCIDOIDEA

Family PTEROMALIDAE

Subfamily ASAPHINAE

1. *Asaphes suspensus* (Nees)

(Fig. 6)

1834. *Chrysolampus suspensus* Nees, *Hym. Ichneum. Affin. Mono. gen. Europaea sp. illust.* 2: 127. (HDEO)

1969. *Asaphes suspensus* (Nees), Graham, *Bull. Br. Mus. nat. Hist. Ent. Suppl.* 16, 82.

1979. *Asaphes suspensus* (Nees), Boucek et al, *Oriental Ins.* 12 (4): 436.

Diagnostic characters : Female: Length: 1.5-1.6mm. Body brownish black with metallic blue reflection, propodeum and petiole less bright; antennae black; legs except coxae testaceous, femora more or less infusate. Head and thorax with rather less numerous bristles. Pronotal collar with the



6. *Asaphes suspensus* (Nees), female

shoulders more rounded. Head in dorsal view with temples curved and rather strongly convergent, not angulate posteriorly; speculum of fore wing indistinct or absent.

Material examined : 2 F, Nimmu, N 34°09'35.31'' E 77°53' 20'', Alt. 3535 m, Ladakh range, 5.vii.2008, coll. P.M.Sureshan (Reg.No. A. 1217, 1218)

Distribution : Palearctic, Nearctic, Neotropical and Oriental Regions. Probably introduced world wide.

Biology : Common hyperparasite of many species of aphids through various aphidinae (Braconidae). Adults are available in July – August.

Remarks : A Palearctic species widely introduced worldwide along with the host and crop plants. In the Indian subcontinent, records are available from India (Kashmir (Sri Nagar), Himachal Pradesh, Uttar Pradesh and Punjab). Pakistan, Nepal. Reported for the first time from Ladakh .

Subfamily PTEROMALINAE

2. *Dibrachys cavus* (Walker)

1835. *Pteromalus cavus* Walker, *Mono. Chalciditum. Ent. Mag.* 2: 477.

1913. *Dibrachys cavus* (Walker): Kudjumov, *Ruska ent.obozr.* 13:11.

1979. *Dibrachys cavus* (Walker): Boucek et al, *Oriental Ins.* 12 (4): 441.

Diagnostic characters : Female: Length 2.5mm. Head and mesosoma bronzy black; antennae brown with scape and pedicel testaceous; legs except coxae testaceous, femora brown; coxae concolorous with thorax. Head 1.8 to 1.9x as broad as its maximum length; clypeus shallowly emarginated. Antennae with second anellus quadrate. Forewing with MV 2.1x STV, PMV as long as STV. Gaster longer than thorax.

Material examined : 1 F, Forest Rest House campus Leh , N 34°10' 04.8'' E 77°35' 32.4'', Alt. 3540 m , Ladakh range , 4.vii.2008, coll. P.M. Sureshan (Reg. No. A.1219)

Distribution : Widely distributed in the Palearctic Region; also reported from Nearctic and Neotropical Regions, Africa and Australia.

Biology : A widely distributed polyphagous species associated mainly with lepidopteran pupae

and hyperparasitic through Ichneumonidae and Braconidae often via Tachnidae also. Reported as emerged in soil with the pupae of Geometrid moth *Ectropis* in India (Boucek et al, 1979).

Remarks : From the Indian subcontinent records are available only from India (Himachal Pradesh and Kashmir) and Pakistan. First record from Ladakh .

3. *Pachyneuron nelsoni* Girault

1928. *Pachyneuron nelsoni* Girault, *A prodigious docurse on wild animals*: 2.

1929. *Pachyneuron aeneus* (!) Masi, *Annali Mus. Civ. Stor. Nat. Giacomo Doria.* 53: 229-231. syn. Boucek, 1988: 442.

1974. *Pachyneuron kamathi* Mani & Saraswat. *Mem. School. Ent. Agra.No.3*: 95.Syn. Boucek et al, 1979: 450.

1974. *Pachyneuron deccanensis* Mani & Saraswat. *Mem. School. Ent. Agra. No. 3*: 95. Syn. Boucek et al, 1979: 450.

Diagnosotic characters : Female: Length 2.0mm. Body black with metallic green reflection; antennae dark brown except basal part of scape testaceous. Anterior margin of clypeus weakly emarginated; antenna with scape not reaching median ocellus, thorax finely reticulate; forewing without marginal fringe, discal ciliation very sparse, indistinct, PMV only slightly longer than STV, MV strongly thickened.

Material examined : 1 F, Keshar, N 34°04'3.48.'' E 77°38' 48.63'', Alt. 3246 m Changthang valley, 13.vii.2008, coll. P.M. Sureshan (Reg.No.A. 1214)

Distribution : Widely distributed in warmer parts of Europe, Africa, South Asia and Australia. Introduced in many areas outside Europe.

Biology : Parasitoids of Diptera (Syrphidae) and Hemiptera (Aphididae).

Remarks : In India the species has been reported from Delhi, Himachal Pradesh, Karnataka, Maharashtra and Uttar Pradesh. First record of the species from Ladakh.

4. *Schizonotus latus* (Walker)

(Fig. 8)

1835. *Pteromalus latus* Walker. *Ent. Mag.*, 1: 481.

1907. *Arthrolytus incongruens* Masi, *Boll. Lab. Zool. Gen. agr.R.Scuola Agric. Protici* 252-254.

1956. *Schizonotus latus* (Walker): Graham, *Ent. Mon. Mag.* 92: 260.

1979. *Schizonotus latus* (Walker): Boucek et al, *Oriental Ins.* 12 (4): 455.

Diagnostic characters : Female: Length 2.4-2.5mm. Body brownish black; clypeus not projecting below level of genae; antennae dark brown with scape and pedicel testaceous, anelli together almost equal to width of second anellus; F2 1.2-1.5x as wide as long. Propodeum with distinct median carina and plicae.



8. *Schizonotus latus* (Walker), female.

Material examined : 3 F, Hemis N.P, N 33°54' 51.8'' E 77°42' 46.4'', Alt. 3568 m, Ladakh range, 4.vii.2008, coll. P.M.Sureshan (Reg.No. A.1211, A.1220, A. 1229).

Distribution : Europe, America, North Africa and Pakistan.

Biology : Parasitoids of Chrysomelidae (Coleoptera) and Tachnidae.

Remarks : The species is widely distributed in the Palearctic Region and parts of America and North Africa. In the Oriental Region, records are available only from Pakistan. This is the first record of the species from India.

5. *Pteromalus semotus* (Walker)

1834. *Eutelus semotus* Walker, *Ent. Mag.* 2: 367.

1965. *Habroclytus semotus* (Walker): Boucek, *Sb.faun. Praci ent. Odd.Ndr.Mus.Praze* 11: 8, 35.

1906. *Etroxys marginicollis* Cameron. *J.Bombay Nat. Hist.Soc.* 17: 97.

1978. *Pteromalus semotus* (Walker), Boucek & Graham, *Ent. Gaz.* 29 : 225-235.

Diagnostic characters : Female: Length 2.6mm. Body dark metallic green with golden reflection; antennae brown; POL 1.8x OOL; temple length 0.4x eye length; anterior margin of clypeus weakly emarginated; antennae with pedicel little longer than F1. Propodeum 0.5x as long as scutellum. Forewing with MV short, 1.1x to 1.6x STV. Gaster 1.1 xs as long as head plus thorax combined.

Distribution : Widely distributed in the Palearctic region. Almost cosmopolitan due to introduction.

Material examined : 1F, Sumdho, N 330 13' 51'' E 780 22' 18.8'', Alt. 4427 m, Changthang valley, 12.vii.2008 (Reg.No.A.1226); 1F, Hunder, N 340 34' 48.8'' E 770 28' 45.4'', Alt. 3190 m, Ladakh range, 7.vii.2008 (Reg.No. A. 1227); 1 F, Skidmang, N 330 22' 47.7'' E 780 16' 10.3'', Alt. 4041 m, Ladakh range 13.vii. 2008 (Reg.No.A. 1228); 1F, N 330 37' 09.9'' E 780 05' 0.00'', Alt. 3840 m, 10 km to Hamya on the way to Upshey , Ladakh range, 14.vii.2008 (Reg.No. A.1241), coll. P.M.Sureshan.

Biology : Primary parasite or hyperparasite of various Lepidoptera and some Coleoptera. Adults are available in July – October.

Remarks : Though a widely distributed species, few records are available from India (Kerala, Orissa, and Bihar). First report from Ladakh .

6. *Pteromalus puparum* (Linnaeus) (Fig. 3)

1758. *Ichneumon puparum* Linnaeus. *Syst. Nat.* 10 th Edt. 567.

1795. *Pteromalus puparum* (Linnaeus): Swederus, *K.svenska Vetensk Akad Handl.* 16: 203.

1979. *Pteromalus puparum* (Linnaeus), Boucek et al, *Oriental Ins.* 12 (4): 454.

Diagnostic characters : Female: Length 2.6-3.4mm. Body bright metallic bluish green ; antennae with scape testaceous, remainder brown; coxae concolorous with thorax, remainder testaceous; POL as long as OOL; temple length 0.6x eye length; anterior margin of clypeus shallowly emarginated; antennae with F1 longer than pedicel; funicular segments longer than wide. Propodeum medially 0.7x as long as scutellum; nucha long. Gaster ovate, shorter than head plus thorax combined.



3. *Pteromalus puparum* (Linnaeus), female

Material examined: 1 F, Hemis N.P, N 33°54' 51.8" E 77°42' 46.4", Alt. 3568 m, Ladakh range, 5.vii.2008 (Reg.No. A.1220); 2 F, Hunder, N 34°34' 48.8" E 77°28' 45.4", Alt. 3190 m, Ladakh range, 7.vii.2008 (Reg.No.A.1225, 1227); 1F, Trishak, N 34°28' 40.11" E 77°43' 52.58", Alt. 3236 m, Nubra valley, 8.vii.2008 (Reg.No.A.1223); 2F, Sumdho, N 33°13' 51" E 78°22' 18.8", Alt. 4427 m, Changthang valley, 12.vii.2008 (Reg.No.A. 1222, 1226); 1F, 3 km to Chanthang from Mahe bridge, N 33°21' 32.7" E 78°21' 23.9", Alt. 4051 Metre Changthang valley, 12.vii.2008 (Reg.No. A.1221); 1F, Nimmu, N 34°09' 35.31" E 77°53' 20", Alt. 3535 m, Ladakh range, 5.vii.2008, (Reg.No. A.1224).

Distribution : Widely distributed in Europe, parts of America, Asia, Africa, (probably introduced in all parts of the world).

Biology : Parasitoids in pupae of various butterflies, some times hyperparasitic. Adults available in May – October.

Remarks : A cosmopolitan species introduced in various parts of the world. Reports are also available from India (Kerala, Uttar Pradesh, Assam, Bihar, Uttaranchal, Himachal Pradesh, Meghalaya, Punjab and Tamil Nadu). First record of the species from Ladakh.

Subfamily MISCOGASTERINAE

7. *Halticoptera smaragdina* (Curtis)

(Fig. 5)

1832. *Phagonia smaragdina* Curtis, *British entomology* 9: 427.

1832. *Pachylarthrus insignis* Westwood, *Phil.Mag.* (3) 1: 127.

1876. *Halticoptera flavicornis* Spinola Thomson, *Hym. Scand.* 4: 248.

1969. *Halticoptera smaragdina* (Curtis): Graham, *Bull. Br. Mus.nat.Hist.Ent.Suppl.*16,159.



5. *Halticoptera smaragdina* (Curtis), female

Diagnosotic characters : Female: Length: 3.14mm. Body bright metallic green; antennae dark testaceous with scape blackish; coxae concolorous with thorax, femora brownish black, remainder of legs testaceous. Malar space about equal to transverse diameter of eye, and about two thirds as long as an eye. Vertex slightly elevated in middle, beyond the ocelli; temples about half as long as eye. Median area of propodeum strongly reticulate. Gastral petiole as long as or usually slightly longer than broad.

Material examined : 1F, Skidmang, N 33°22' 47.7" E 78°16' 10.3", Alt. 4041 m, Ladakh range 13.vii.2008, coll.P.M.Sureshan (Reg.No. A.1208).

Distribution : Palearctic and Nearctic Regions.

Remarks : First record of the species from the Oriental region.

8. *Halticoptera circulus* (Walker)

(Fig. 4)

1833. *Dicyclus circulus* Walker, *Ent.Mag.* 1: 456.

1833. *Dicyclus fuscicornis* Walker, *Ent.Mag.*1: 456.

1969. *Halticoptera circulus* (Walker): Graham, *Bull. Br. Mus.nat.Hist.Ent.Suppl.*16, 163.

Diagnostic characters : Female: 1.5-1.9mm. Body dark metallic bluish green; antennae testaceous with scape and pedicel black; coxae concolorous with thorax, femora brown, remainder of legs testaceous. Forewing with apex of basal cell bare or with only a very few hairs. Pronotal collar rounded off anteriorly, reticulate with at most a very narrow shiny strip along its hind margin. Propodeum almost shiny; gastral petiole strongly reticulate with median carina.



4. *Halticoptera circulus* (Walker), female

Male : Length: 1.5-2mm. More metallic green with golden reflection; antennae and legs golden yellow except coxae concolorous with thorax.

Material examined : 1 M, Sumdho, N 33°13' 51" E 78°22' 18.8", Alt. 4427 m, Changthang valley, 12.vii. 2008 (Reg.No.A. 1216); 6 F, Hemis N.P. N 33°54' 51.8" E 77°42' 46.4", Alt. 3568 m, Ladakh range, 4.vii. 2008, (Reg.No. A.1215); 1 M, 10 km to Hamya on the way to Upsyhey, N 33°37' 09.9" E 78°05' 00", Alt. 3840 m, Ladakh range, 14. vii.2008 (Reg.No.A. 1242), coll. P.M.Sureshan.

Distribution : Widely distributed in the Palearctic region and parts of America, Africa and China.

Biology : Parasitoids of various Diptera mainly mining in the leaves especially family Agromyzidae, Cecidomyiidae and Chloropidae.

Remarks : Recorded for the first time from the Oriental region.

9. *Lamprotatus splendens* Westwood
(Fig. 2)

1833. *Lamprotatus splendens* Westwood, *Mag. Nat.Hist.* 6:121.

1955. *Lamprotatus splendens* Westwood: Delucchi, *Acta Univ. lund (n.s.) Avd.* 2, 50(20): 12, 18-19.

1969. *Lamprotatus splendens* Westwood: Graham, *Ent. Mon. Mag.* 92: 260.

Diagnostic characters : Female: Length: 3.9-4mm. Body bright metallic blue; antennae uniformly black; legs except tarsi black with metallic blue reflection, tarsi testaceous; sculptured part of gastral petiole 1.6 to 3 x as broad as long, less than half as long as the propodeum, its front edge with a sharp transverse carina. Mid femora rather stouter, excluding the trochantellus 4 to 4.5x as long as broad. Combined length of pedicellus and flagellum 1.3 to 1.4 x breadth of head, flagellum rather stouter.



2. *Lamprotatus splendens* Westwood, female

Material examined : 1 F, Forest rest house campus, Leh, N 34°10' 04.8" E 77°35' 32.4", Alt. 3540 m, Ladakh range, 4.vii.2008, (Reg.No. A.1210); 1F, Horze, N 34°11' 37.6" E 77°36' 04.9", Alt. 3609 m, Ladakh range, 11.vii.2008, (Reg.No. A.1209), coll.P.M.Sureshan.

Distribution : Widely distributed in the Palearctic Region and parts of America.

Biology : Parasitoids of various leaf mining Diptera.

Remarks : First record of the species from the Oriental region.

10. *Sphaeripalpus lacunosus* Huang
(Fig. 7)

1990. *Sphaeripalpus lacunosus* Huang, *Sinozoologia* 7: 253.

Diagnostic characters : Female: Length: 3.1mm. Body bright metallic green; antennae dark brown; coxae and base of femora concolorous with thorax, remainder of legs testaceous; wings hyaline, veins

dark brown. Scutellum with frenum clearly marked; dorsellum punctulate. Gaster punctuate; petiole 2x as broad as long with transverse crests both anteriorly and posteriorly.



7. *Sphaeripalpus lacunosus* Huang, female

Material examined : 1 F, Sumdho, N 33°13' 51'' E 78°22' 18.8'', Alt. 4427 m, Changthang valley, 12.vii. 2008, (Reg.No. A.1212), coll.P.M.Sureshan.

Distribution : China (Xinjiang).

Biology : Not known.

Remarks : First record of the species outside the type locality (China). The identification of the species is only based on the original description which is very poor, with only little information.

SUMMARY

As per the available literature about 33 species of hymenopteran insects are reported from Ladakh

which include one species of Chalcidoidea (Eurytomidae) (Chandra *et al.*, 2009). The fauna of Ladakh region of Trans Himalaya is mainly represented by the Palearctic elements, followed by the local endemics and Oriental elements. High altitude insect life of the Himalaya is also remarkable for the high species endemism (Mani, 1974). Out of the ten species of Pteromalidae dealt here, all are reported for the first time from the Ladakh region of Jammu & Kashmir and four (*Lamprotatus splendens*, *Halticoptera circulus*, *Halticoptera smaragdina* and *Sphaeripalpus lacunosus*) are reported for the first time from the Oriental region. Most of the species are Palearctic in origin and some of them have wider distribution in the Nearctic and Neotropical regions. The species *Pteromalus puparum*, *Pteromalus semotus* and *Pachyneuron nelsoni* have a wider distribution in different parts of the world probably due to their introduction along with the hosts. The species *Sphaeripalpus lacunosus* Huang was described from China (Xinjiang) and reported here subsequently after the original description.

ACKNOWLEDGEMENTS

I am grateful to Dr. K. Venkataraman, the Director Zoological Survey of India, Kolkata for providing necessary facilities and encouragement.

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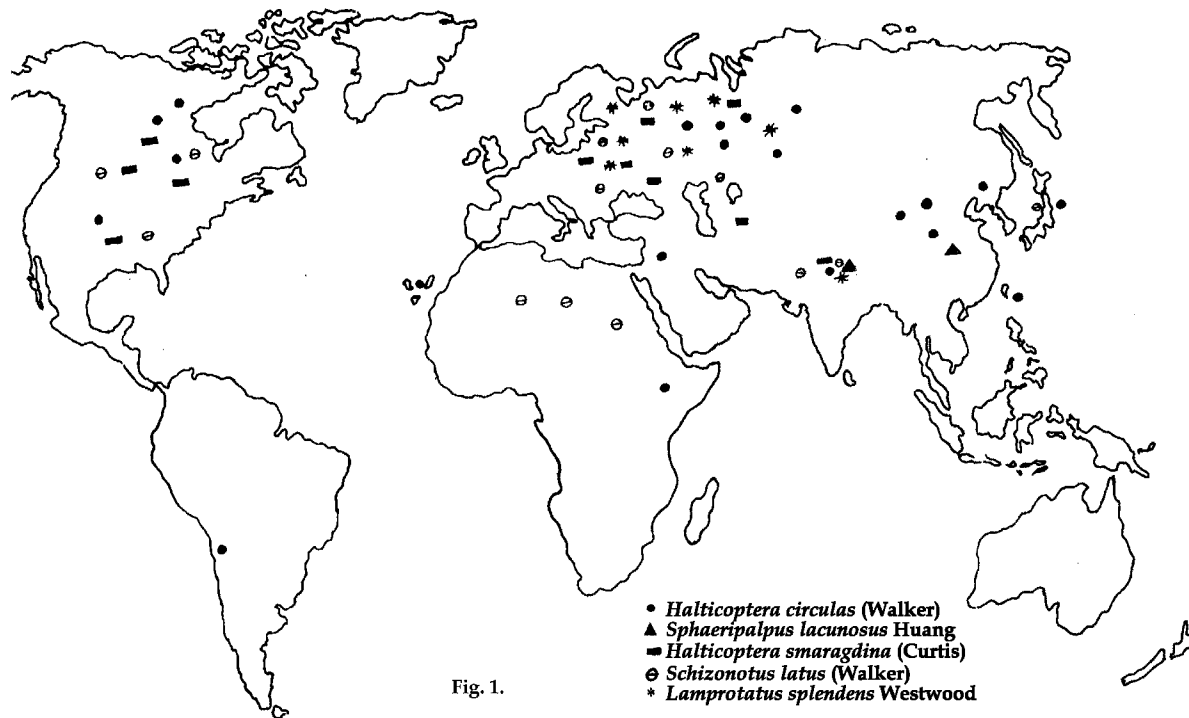


Fig. 1. World map showing the geographical distribution of five species of Pteromalidae (New records from Ladakh, India)