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First record of Microtypinae (Hymenoptera: Braconidae) from Pakistan with the description of a new species

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Abstract

Subfamily Microtypinae is recorded for the first time from Khyber Pakhtunkhwa province of Pakistan. A new species, *Plesiotypus chitralensis* of the subfamily Microtypinae is described and illustrated. The specimen was collected at light in Chitral. Among the *Plesiotypus* species the new species is different from all other described species due to the combination of presence of complete occipital carina, median longitudinal carina on propodeum and the orange yellow second metasomal tergite. The new species is the fourth species described in genus *Plesiotypus* Achterberg. *Plesiotypus chitralensis* is compared with its closely related species *Plesiotypus convexus* Achterberg.

Keywords: Braconidae, Microtypinae, *Plesiotypus*, Hymenoptera, new species, new species.

1. Introduction

Braconidae is a large and cosmopolitan family of parasitic wasps. Within Hymenoptera braconidae are the second to Ichneumonidae is species richness with the number of known species around 40,000 worldwide [15]. Braconologists differ as to the number of subfamilies within the family. Achterberg (1993) [5] recognizes 44 subfamilies, while Sharkey (1993) [15] considers some subfamilies of Achterberg (1993) [5] as tribes within large subfamilies and recognizes 29 subfamilies.

Braconidae are parasitoids of eggs, larvae and adults of many pest insects. For this reason these wasps have been extensively used in biological control of plant feeding insects. The hosts they parasitize belong to orders Lepidoptera, Coleoptera, Diptera, Hymenoptera, Hemiptera, Homoptera and Psocoptera [1, 7, 8, 16].

In Khyber Pakhtunkhwa province, work on this group started when Inayatullah and Karimullah (1996) [13] presented the first key to the subfamilies of Braconidae. Later, Inayatullah (2002 [9], 2003 [10]) reported new records of braconidae and presented updated keys for their identification. Inayatullah and Naeem (2004a [11], 2004b [12], Ahmad and Inayatullah (2006) [6], Inayatullah *et al.* (2013) [14] and Tahira *et al.* (2013) [18] made additional contributions to the knowledge of Braconidae of Pakistan.

Genus *Plesiotypus* was erected by Achterberg (1992) [4] who included three species in the genus including two new and one *fullaway* already described as genus *Microtypus* Ratzeburg. He also presented the first key to the species. The genus is closely related to *Microtypus* in general appearance, however the combination of characters like the presence of short vein 3-SR (Fig. 4), the robust tarsal claws, complete notauli (Fig. 5) and the absence of spine on terminal flagellomere will separate it from *Microtypus*.

In the present work a new species of the genus *Plesiotypus* Achterberg belonging to subfamily Microtypinae is described and illustrated. The species is different from the already provided descriptions for already described species of *Plesiotypus* in literature and does not fit in Achterberg (1992) [4] key to species of the genus and is therefore new to science. Microtypinae is recorded for the first time from Pakistan.

2. Materials and Methods

The study is based on braconid material present in the insect collection of the Department of Entomology, The University of Agriculture, Peshawar. The specimen was collected during an expedition to the Northern areas of Pakistan. The specimens was washed in home detergent and then rinsed with clean water. Microtypinae specimen was sorted out and identified using the keys to genera and species of Microtypinae by Achterberg (1992) [4].

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The specimen was examined under stereo-zoom trinocular microscope (Nikon SMZ 745M) with 350X magnification. Photographs of important diagnostic characters and measurements were taken by 5.01 MP digital camera attached to the stereo-microscope. Terminology used in this paper is that of van Achterberg (1988) [3]. T1 and T2 are abbreviations for metasomal segment 1 and 2 respectively. The type material has been deposited in the Insect Museum of the Department of Entomology, The University of Agriculture, Peshawar-Pakistan.

3. Results

Plesiotypus chitralensis, new species

Material Examined: Holotype, Female: Pakistan, Khyber Pakhtunkhwa, Chitral, Shandur Pass 4.viii.2004, (Ovchinnikov) on light

Diagnosis: occipital carina complete; notauli distinct and crenulate; propodeum with mid-longitudinal carina at anterior half, posteriorly rugose; T1 longitudinally costate; T2 smooth and orange yellow, contrasting with black posterior metasomal tergites.

Description: 1 female; Measurements: Body length 4.9 mm, length of forewing 4.5 mm, length of ovipositor 3.4mm.

Colour: Head black, a small area in front and behind eyes yellowish-orange, antennae brownish-black except the brownish-yellow scape and pedicel; legs yellow, maxillary and labial palpi light yellow; T1 brownish-black, T2 orange-yellow, remaining metasoma shining black.

Head: antennae broken, remaining antennal segments 31, 3rd segment 1.2x longer than 4th and 4X longer than width, all segments longer than broad, cylindrical, tightly fitted, basal segments longer, segments gradually becoming shorter distally, all segments covered with short dense setae; eyes large, without setae, almost parallel when viewed from front (Fig. 2); malar space 1.2x basal width of mandible; clypeus convex, lower margin flat and transverse, with sparse pits and setae; mandible overlap 50% of its length; epistomal area prominent, wide shallow and sparsely sculptured, suture not distinct; face smooth with moderately long and sparse whitish hairs (Fig. 2); area below antennal sockets with transverse sparse ridges which can be seen only at high magnification; occipital carina complete, occipital flange present behind and below level of mandibles; Anterior Tentorial Pits distinct, round and deep. Inter-Tentorial Distance 4.5xTentorio-ocular Distance; Ocello-Ocular Distance 1.2x ocellus diameter; ocelli not on the same plan, part of anterior ocellus on anteriorly slanted area just above frons; frons smooth and shining, slanting anteriorly; vertex small; vertex, gena and subgena smooth, with sparse hairs (Fig. 3).

Mesosoma: 1.25X longer than high; pronotum transverse, smooth, except extreme lateral margin with a row of punctures; prosternum smooth, precoxal sulcus completely impressed with a distinct median longitudinal lamellate carina, carina with crenulae at base throughout length; prepectal carina distinctly present reaching tegulae; postpectal carina present; notauli complete and well impressed, crenulate, meeting posteriorly forming a wide rugose area (Fig. 5); mesonotal lobes smooth and with white setae (Fig. 5); scutellar

sulcus deep and wide, with median carina; scutellum smooth, moderately humped and triangular; metanotum distinct, shining black, nitid; mesopleuron smooth and shining, nitid; sternulus not distinct, the area smooth and shallow; metapleural smooth with a small flange downwards; propodeum anteriorly smooth, with a distinct median longitudinal carina anteriorly, posteriorly strongly rugose (Fig. 6 A).

Wings: forewing hyaline, vein 1-SR distinctly present, as long as half width of parastigma, vein r straight, 1.8x width of pterostigma, 3-SR and 2-R1 distinct, SR-1 straight, reaching anterior wing margin somewhat before wing tip; 3-SR distinctly present, r: 3-SR: SR-1= 35:4:114 (Fig. 4), cu-a post furcal; 1-M curved; r-m nebulus, equals 2-SR+M in length. Hind wing 1-M slightly longer than 1r-m. vein 2-1A complete, CU1b incomplete when near 2-1A. Legs long, hind tibia 5x longer than broad; hind tibial spur 0.4x the length of hind basitarsus, claw without basal lamella.

Metasoma: almost equals mesosoma in length; Tergite 1 2.7x longer than apically broad, surface longitudinally costate, with short setae, distinctly narrowed behind spiracle (Fig. 6 B); second tergite slightly broader than long, smooth, with sparse whitish setae, setae comparatively dense basally. Following segments smooth shining, setose and broader than long. Hypopygium not distinct. Ovipositor sheath with long setae, 1.65x longer than metasoma; ovipositor with a subterminal node and longitudinal depression on both sides (Fig. 7)

Etymology: The species is named after the type locality (Chitral) where the type specimen was collected.

Male: Not known.

Host: Not known.

Comments: *Plesiotypus chitralensis* new species is closely related to *Plesiotypus convexus* Achterberg: both the species have complete occipital carina, convex clypeus, distinct and crenulate notauli, longitudinally costate T1 and the short vein 2-SR. The new species, *Plesiotypus chitralensis*, is different on the basis of orange yellow and completely smooth T2, which is brownish black and basally carinate in *P. convexus*. The propodeum is with mid-longitudinal carina at anterior half in *P. chitralensis*, whereas the propodeum is largely areolate in *P. convexus*.



Fig 1: Habitus of *Plesiotypus chitralensis* new species.

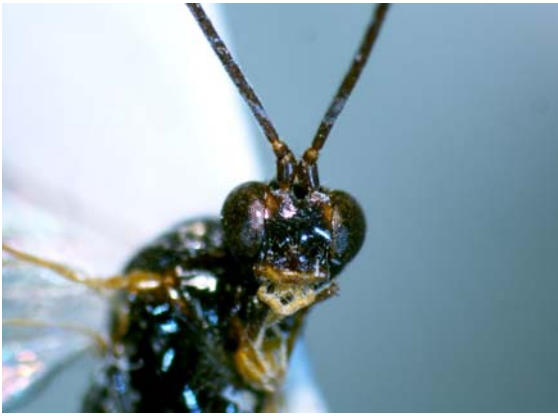


Fig 2: Head, frontal view of *P. chitralensis*.



Fig 3: Head of *P. chitralensis*, dorsal view.



Fig 4: Front wing of *P. chitralensis*; arrow pointing to short vein 3-SR

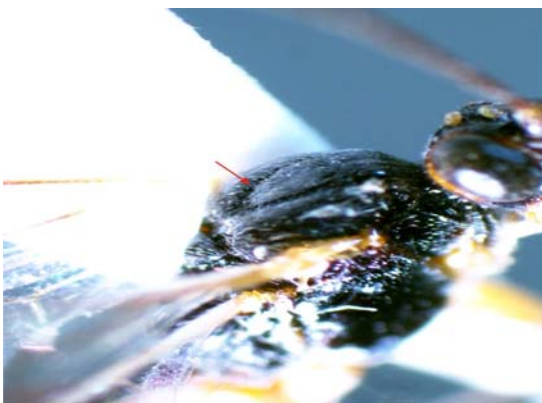


Fig 5: Mesothorax of *P. chitralensis*; arrow pointing to crenulate notauli.



Fig 6: *P. chitralensis*, arrow pointing to: A, longitudinal carina on propodeum; B, T1; C, the orange yellow T2.



Fig 7: Ovipositor of *P. chitralensis*.

4. Discussion

Among the braconid subfamilies Microtypinae is small subfamily recognized by the slender body, presence of small triangular or tapazoidal second submarginal cell in the forewing, long ovipositor in female and long antennae [19]. The status of the group as a subfamily is controversial. The subfamily was erected by Szeligeti (1908) [17]; the subfamily rank of the group was reduced to tribe Microtypini within subfamily Homolobinae by Achterberg (1984) [2]. Later Achterberg (1992) [4] presented a historical background of different treatment of this group and argued in favour of subfamily rank. Sharkey (1993) [15] rejects the subfamily rank of Microtypinae and recognize the group as tribe Microtypini within subfamily Homolobinae.

Microtypinae as a group is not diverse, but occurs in almost all parts of the world except Australian region. Worldwide three genera are known: *Neomicrotypus* Achterberg, *Microtypus* Ratzeburg and *Plesiotypus* Achterberg. So far, nine species are known in all the three genera. Genus *Neomicrotypus* includes a single species, *N. pinae* Achterberg. Genus *Microtypus* contains five species: *M. algericus* Szeligeti, *M. desertorum* Shestakov, *M. wesmaelii* Ratzeburg, *M. trigonus* Nees and *M. petiolatus* Achterberg. Three species are known in *Plesiotypus*: *P. fullaway* (Breadley), *P. depressus* Achterberg and *P. convexus* Achterberg. In the present study one new species *Plesiotypus chitralensis* is described and illustrated. This is the only species within the genus *Plesiotypus* which has a combination of characters like the presence of mid-longitudinal carina on propodeum, longitudinally costate metasomal tergum 1 and the orange yellow second metasomal tergite. This addition raises the number of *Plesiotypus* species to four and that of Microtypinae to 10 in the world. Majority

of the species are Holarctic in distribution (Achterberg, 1992) [4]. Microtypinae is recorded for the first time from Pakistan.

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