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Genus *Epitranus* Walker (Chalcididae: Chalcidoidea) with two species, new records for Khyber Pakhtunkhwa, Pakistan

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Abstract

Insects were identified from Chalcidid collection, collected from different ecological zones of Khyber Pakhtunkhwa, Pakistan, present in Entomology Museum, The University of Agriculture, Peshawar, Pakistan. Among them, 2 species of genus *Epitranus* Walker (Chalcididae: Hymenoptera), were identified to be new records for Khyber Pakhtunkhwa and Pakistan. These insects were collected through insect sweep net and Malaise Trap during 2000-2014. Key to the species along with the diagnostic characters, host records, distribution and Illustrations of important characters is also provided.

Keywords: *Epitranus*, New Records, Khyber Pakhtunkhwa, Pakistan, Natural Enemies, Insect Taxonomy.

1. Introduction

Members of family Chalcididae are variable in size. They are medium to large sized insects, varying in size from as small as 1.5 mm to as large as 27 mm in length. The family can be recognized with a number of characters i.e. coarse setiferous punctures on head and thoracic dorsum, metafemur enlarged and swollen with toothed ventral margin, metapleuron larger and arched metatibia (Gibson *et al.*, 1997) [12]. Family Chalcididae also resembles Leucospidae in appearance and in many features including body size, coarse and setiferous punctures on head and thorax, arched metatibia and enlarged and toothed metafemur, but Chalcididae differs from Leucospidae by having flat forewing instead of lengthwise folding, labiomaxillary complex poorly developed, usually exposed labrum, tegulae more or less broad or oval, apex of scutellum modified and dorsellum simple [5]. Members of subfamily Podagrioninae of family Torymidae are also similar to Chalcidids but they lack setiferous punctures and long ovipositor. Chalcidids are parasitoids of insects belonging to order Lepidoptera, Diptera, Coleoptera and some are parasitoids of other Hymenoptera. These orders are of economic importance as they are pests of Agricultural crops and chalcidids control their population by attacking these pests in larval or pupal stage. Most of these parasitoids are used as biological control agents and play an important role in the ecosystem [10, 45].

Taxonomic study of Chalcidids started with *Spex sispes* (*Chalcis sispes*), *Vespa minuta* (*Brachymeria minuta*) etc reported by Linnaeus [29]. Linnaeus was followed by [11, 42, 48, 27, 44]. Among later studies, [2, 3, 9, 13, 32, 46, 40, 4, 36, 29, 18, 19, 35] made significant contribution to the knowledge of Chalcididae worldwide.

Taxonomic study of Chalcididae in Pakistan started with Khokhar *et al.*, [25] who described *Brachymeria bicolorata* as pupal parasite of *Earias spp.* on cotton from Sind province. Samad *et al.*, [39] reported *Brachymeria ocellata* as pupal parasite of fruit fly *Dacus ferrugineus* from Karachi. Later on, [1, 38, 24, 41] also contributed to chalcidid fauna of Pakistan. Irshad [23] reported 14 species in four genera from Pakistan out of which 3 genera with six species are from Khyber Pakhtunkhwa. Iqbal *et al.*, [22] reported 3 species of genus *Hockeria* from Khyber Pakhtunkhwa. He has also provided key for the identification of species along with illustrations of important characters. Noyes [37]. In his online database reported total of 29 species under seven genera from Pakistan.

Keeping in view importance of taxonomic study of Chalcididae, current study was conducted to collect, rear and study morphological characters of these insects. We report 2 species new to the records of Khyber Pakhtunkhwa as well as Pakistan. Key to the species of the genus *Epitranus* along with illustrations of important characters is also given.

2. Materials and Methods

Insects were collected round the year from different ecological zones of Khyber Pakhtunkhwa, Pakistan. Insect Collection was done during years 2000-2014 throughout the year. Besides other insects, total of 200 Chalcididae specimens were collected during this time. Chalcididae were randomly encountered during collection process. Collection was mostly done with the help of sweep net, however Malaise traps were also installed in places of low vegetation especially grasses. Species of genus *Epitranus* are reported from plain areas of the province and none of the species is reported from hilly areas of the province.

Literature shows that genus *Epitranus* is mainly parasitoid of Tanaidae and Pyralidae. Lab rearing of these hosts was conducted in Entomology Museum, The University of Agriculture, Peshawar, but no species of *Epitranus* was collected from the host rearing.

Insects collected from field were preserved in 70% ethanol and then transferred to 97% ethanol for 5 hours before mounting them on point cards. As Chalcididae are too small to pin, therefore point mounting was done. Morphological terms of Gibson *et al.*,^[12] (1997) was followed whereas terminology of surface sculpturing of Harris^[20] (1979) was followed.

Literature followed include, Akinobu Habu^[19, 20] (1960, 1962), Medvedev^[34] (English translation (1985)), Zdenek Bouček^[7] (1988), Narendran^[36] (1989), Grissel and Schauff^[18] (1990), Bouček & Delvare^[8] (1992), and Gibson *et al.*, (1997)^[12].

Specimens were compared with paratypes present at Bohart Museum of Entomology, The University of California, Davis, USA. Microscope Nikon SMZ 745T was used for observation and identification of specimens, camera Lucida was used to draw illustrations of important characters. Key to the important characters of the species is also provided.

Identified species are deposited in the Insect Museum of the Department of Entomology, The University of Agriculture, Peshawar, Pakistan.

Terminology and abbreviations used in the description are:

Metasoma: The abdomen in Apocrita (Hymenoptera).

Petiole: First metasomal segment.

T1: Abdominal segment 1

3. Results

Genus *Epitranus* Walker

Epitranus Walker, 1834: 21, 26.

Type species *Epitranus fulvescens* Walker; by monotypy.

Neoanacryptus Girault, 1913(158):86.

Type species *Neoanacryptus petiolatus* Girault; by original designation.

Chalcitelloides Girault, 1914(177):30.

Type species *Chalcitelloides nigriscutum* Girault; by original designation.

Description repeated by Girault, 1915(245): 351.

Paranacryptus Girault, 1915(245): 349.

Type species *Paranacryptus sanguineus* Girault; by original designation.

List of synonyms also includes *Chalcitella* Westwood, 1835, *Anacryptus* Kirby, 1883, *Arretocrea* Kirby, 1883, and *Pararretoceroidea* Mani, 1938. All of them are based on extralimital species.

The genus can be identified by contracted frons in antero lateral view; scrobe flat or very shallow, not deep; preorbital carina weak or strong and postorbital distinct; antennae with short pedicel, ring segment short; mesoscutellum round apically; forewing with postmarginal vein absent; metafemur

with a large basal tooth on anterior margin of metafemur with a comb of small or widely spaced teeth; abdominal petiole long with longitudinal carinae covering more than half of the abdomen; gaster pointed posteriorly and depressed laterally.

Biology: Host data are rare but small moths of family Pyralidae and Tineidae and some associated with stored grains are the hosts of members of this genus. Adults are usually found on foliage of trees, shrubs but not found on grass usually (Bouček^[7], 1988).

Distribution: South Asia (28 *spp.*), Africa (about 25 *spp.*), Australia (6 *spp.*) (Bouček^[7], 1988).

Key to the Species of Genus *Epitranus* of Khyber Pakhtunkhwa

1. Scrobe shallow, not reaching anterior ocelli; preorbital carina very weak, postorbital carina distinctly meeting the temporal margin; metacoxae longer than abdominal petiole *parvidens* (Strand).
- 1'. Scrobe completely absent; pre and postorbital carinae distinct; metacoxae shorter than abdominal petiole *elongatulus* (Motschulsky).

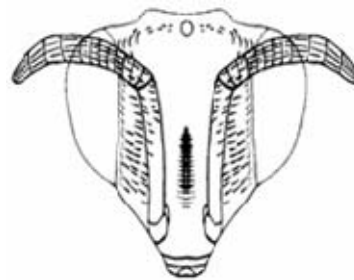


Fig 1: Head. Anterior view

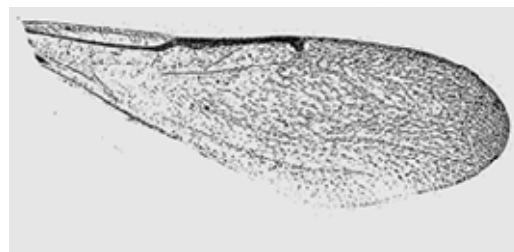


Fig 2: Forewing



Fig 3: Metafemur. Lateral View

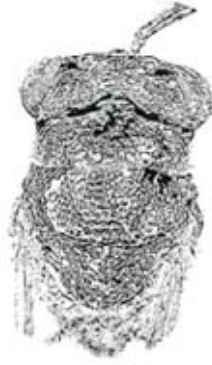


Fig 4: Mesosoma. Dorsal side

Fig 1-4: *Epitranus parvidens*



Fig 5: Head. Anterior view

1. *Epitranus parvidens* (Strand)

(Figs. 1-4)

Anacryptus parvidens Strand, 1911:7-8. ♂. Indonesia, Bintang (ZMHU).

Epitranus nigrus Husain & Agarwal, 1982:423, ♀. India, Hyderabad, (ZDAMU).

Other known synonyms are *Chalcitella borivilia* Mani and Dubey (1973)^[32], *Chalcitella monticola* Mani & Dubey (1973)^[32], *Chalcitella malabarensis* Mani & Dubey (1973)^[32].

Diagnosis: Scrobe shallow, not reaching anterior ocelli, with horizontal rugae; preorbital carina very weak, post orbital carina distinctly meeting the temporal margin; metafemur with a basal tooth anteriorly followed by small, narrow spaced comb of teeth; metacoxae longer than abdominal petiole.

Length: 3.2mm

Description of Male: n = 1♂

The species was first described by Strand in 1911 which was later synonymised by Husain & Agarwal^[22] in 1982. Redescription of the species is therefore not considered necessary.

Female: Unknown

Distribution in Pakistan: Peshawar (Khyber Pakhtunkhwa).

The species has already been reported from Sri Lanka, West Malaysia, Vietnam, British N. Borneo, Philippines, (Narendran, 1989)^[36], India (Karnataka, Andhra Pradesh, Kerala, Maharashtra, Tamil Nadu), Indonesia (Sumatra), Noyes (2014)^[38].

Host: Unknown

Material Examined: 1♂. **Pakistan:** KPK; Peshawar. 34° 1.3'N, 71° 28.5'E. 29.ix.2003. Inayatullah.

Comments

The only male specimen available in our collection fits well into the key and description of male provided by Narendran (1989)^[36]. The species can be separated by having shallow scrobe, not reaching anterior ocelli, with horizontal rugae; metafemur with an anterior basal tooth followed by small, narrow spaced comb of teeth; metacoxae longer than abdominal petiole. The species is widely spread over in Oriental region. However the only specimen available in our collection is not sufficient for measuring any variation. The species is reported on the basis of only one specimen collected during 2000-2014. This shows that the species is rare and is available in climate similar to Peshawar, i.e. the plain areas of the province. Host record of the species is not available. The species is reported for the first time from Pakistan and is therefore new record for Khyber Pakhtunkhwa and Pakistan.



Fig 6: Metafemur. Lateral View



Fig 7: Antenna

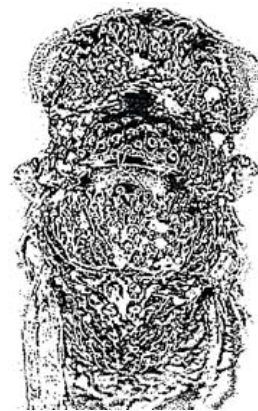


Fig 8: Mesosoma. Dorsal view

Fig 5-8: *Epitranus elongatulus*

2. *Epitranus elongatulus* (Motschulsky)**(Figs. 5-8)***Chalcis elongatula* Motschulsky, 1863, 36(3): 40. ♀. Lectotype. ZMMS.*Epitranus shirakii* Habu, 1960, 11: 299. Holotype, ♀, NIAJ, Japan.*Epitranus elongatulus* (Motschulsky), Bouček, (1982), Jour. Nat. Hist. 16: 577-622.**Diagnosis**

Scrobe absent; pre and post orbital carina distinct; anterior margin of metafemur with a basal carina leading to a blunt basal tooth followed by comb of widely spaced teeth; metacoxa with a carina on inner basal part; anterior margin of mesoscutum with a median rugous and unpitted strip.

Length: 3.4 mm**Description of Male:** n = 1 ♂

The species was described by Motschulsky ^[35] (1863) which was later synonymised by Bouček ^[6] (1982). In current studies we have only one male, we therefore do not consider its description necessary.

Material Examined: 1 ♂. **Pakistan:** KPK; Peshawar. 34° 1.3'N, 71° 28.5'E. 9.vi.2012. Toheed Iqbal.**Female:** Unknown**Distribution in Pakistan:** Peshawar (Khyber Pakhtunkhwa).

The species is widely spread all over Oriental region, S. Japan, S. China (Narendran, 1989) ^[36], India (Delhi, Kerala) and Sri Lanka (Noyes, 2014) ^[38].

Host: Unknown**Comments**

Habu (1960) ^[19] has provided detailed description of this species with name *Epitranus shirakii* Habu. Later, it was synonymised by Bouček ^[6] (1982) as *E. elongatulus*. Narendran ^[36] (1989) mentioned variation in the colour of this species from black to liver brown. The species can be differentiated by having scrobe completely absent, pre and post orbital carina distinct; anterior margin of metafemur with a blunt basal tooth followed by comb of widely spaced teeth; anterior margin of mesoscutum with a median rugous and unpitted strip. Host record of this species is not available. The only male was collected during the month of June from Peshawar area which shows that the species can be collected from the plain areas of the province. The only specimen is reported on the basis of survey conducted during 2000 – 2014. From Khyber Pakhtunkhwa and Pakistan, this species is reported for the first time and is therefore a new record for the area.

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