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RECORD OF GENUS *PROAN* HALIDAY (HYMENOPTER, BRACONIDAE, APHIDIINAE) FROM ARID TRACT OF PUNJAB PROVINCE OF PAKISTAN

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ABSTRACT

Genus *Proan* Haliday (Hymenopter, Braconidae, Aphidiinae), a distinct Aphidiinae parasitoid group have been recorded for the first time from Punjab. Two species namely, *Praon pakistanicum* Kirkland, 1979 and *Proan volucre* (Haliday), 1833 are recorded for the first time from arid tract of Punjab Province of Pakistan. *Praon pakistanicum* Kirkland, 1979 has been redescribed. Both species have been illustrated using micrographs. A tentative key for the identification of these two species has been given.

Key words: *Proan,* Hymenoptera, Aphidiinae, Punjab, Pakistan.

INTRODUCTION

Genus *Proan* Haliday comprised of aphid parasitoids having wing venation with recurrent vein developed; interradial vein effaced, notaulices distinct throughout, lateral lobes of mesonotum setose (Raychaudhuri, 1990; Kavallieratos *et al*., 2001).This group of Aphidiines pupate inside the parasitized aphid in comparison to others (Starý, 1970). Many species of the genus are important as biological control agents in various agro- and forest ecosystems (Rakhshani *et al*., 2007).

A lot of work have carried out on the taxonomic studies of these parasitoids in various parts of the world like in North America (Johnson, 1987), South America (Starý & Vogel, 1985, Starý 1995), Europe (Mackauer, 1959; Starý, 1966; Kierych, 1975; Starý 1981; Boness and Starý, 1988), Greek (Kavallieratos *et al*., 2003) Japan (Takada, 1968), Mediterranea area (Starý, 1976; Starý 1971, 1973; Mescheloff and Rosen (1988),Tremblay & Pennacchio (1985) and Tremblay *et al*. (1985).

From adjacent countries of Pakistan like Iran (Rakhshani *et al*., 2007, Barahoei *et al*., 2010) and India (Raychaudhuri, 1990), but in Pakistan due to lack of basic research on their use as natural bio-control agents only four species of this genus were reviewed by Starý *et al*. (1998). During 2005-07 various surveys were conducted to explore parasitoid fauna of Punjab Province of Pakistan. Two species of this genus were recorded for the first time from Punjab Province and have been presented along with short taxonomic notes. This work will help the workers in future for identification and better utilization of these biocontrol agents in various integrated pest management programmes.

MATERIALS AND METHODS

During 2005-2007, adult parasitoids were collected by net sweeping from wheat and pea. The parasitoids were identified through a reliable key (Raychaudhuri, 1990). The illustrations were prepared using a Nikon microphotograph system (Sms-1500, with 30x 1-11.25x magnification). Measurements of taxonomically important parts were taken with the help of stage and ocular micrometer using Noif microscope (XSZ 107BN, with 10X10X magnification).

RESULTS AND DISCUSSION

Genus *Praon* Haliday
Praon Haliday, 1833: 261, 483-484.
Achoristus Ratzeburg, 1852: 31-32.
Aphidaria Provancher, 1886: 151-152.
Parapraon Starý 1983: 1002.

Head oval somewhat broad across eyes. Antennae filiform with variable number of segments (15-17 recorded segments in Pakistan). Notaulices are distinct through out mesoscutum. Propodeum smooth and carinated. Forwing pterostigma triangular, with distinct metacarp; radial and median veins developed but never reaching the wing margin; radial cell and median cell-1 separated by median abscissa-1; interradial veins absent; intermedian veins effacedly developed. Tergite-1 quadrate or subquadrate. Ovipositer sheath straight or little upwardly curved, with pointed apex and sparsely haired.

Key to the species of Genus *Proan* Haliday: Antennae 17 segmented; tergite-1 subquadrate; mesoscutum with central lobes densely pubescent; pterostigma 1.5 times of metacarp-*volcure* (Haliday)

Antennae 15 segmented; tergite-1 squarish; mesoscutum central lobe densely pubescent, lateral lobes with hairless oval spots; pterostigma 5 times as long as wide, metacarp equal in length to pterostigma - *pakistanicum* Kirkland

***Praon pakistanicum* Kirkland, 1979**

Redescription of female: Head black subcubical, rounded in shape, shiny. Eyes oval shaped, of medium size and with sparsely distributed short-hair. Transverse eye diameter equal to temple. Yellowish-brown face thickly haired, otherwise head sparsely haired. Interocular line shorter than facial line. Intertentorial line (1\6 part) is equal to tentorio-ocular line. Clypeus densely haired. Lower part of genae, clypeus and mouth-parts yellowish-brown. Maxillary palpi 4 segmented and labial palpi 2 segmented. Antennae filiform, reaching to half of abdomen and 15-segmented. F_1 5 times as long as wide, 1/6 longer than segment F_2 (Fig. 1a). Scape, pedicel brown, Flagellar segment 1 yellow to yellowish-brown, remainder brownish-black. Mesoscutum with notaulices distinct throughout, central lobe densely pubescent, lateral lobes with hairless oval spots. Prothorax brown, mesoscutum and metanoturn dark brown to black. Propodeum (Fig. 1c) smooth and pubescent. Wings hyaline, venation brown. Recurrent vein partially effaced. Pterostigma (Fig. 1b) 5 times as long as wide, metacarp equal in length to pterostigma. Radial vein 1/6 shorter than pterostigma. Legs yellow, apices of tarsi darkened.

Tergite-1 (Fig. 1d) yellow to yellowish-brown in coloration, almost smooth, squarish in shape with spiracular tubercles prominent. Distance between spiracular tubercles and apex shorter than width at spiracles. Remaining tergites dark brown to black in coloration, smooth, shiny, with sparsely distributed hairs. Abdomen lanceolate. Ovipositor (Fig. 1e) sheaths dark brown to black.

Material Examined: Observed specimens were collected from Rawalpindi by net sweeping method. Rawalpindi, 29-iii-05, 2♀ and 1♂; attock, 30-iii-07, 4♀ and 2♂a nd Jehlum , 29-iii-06.

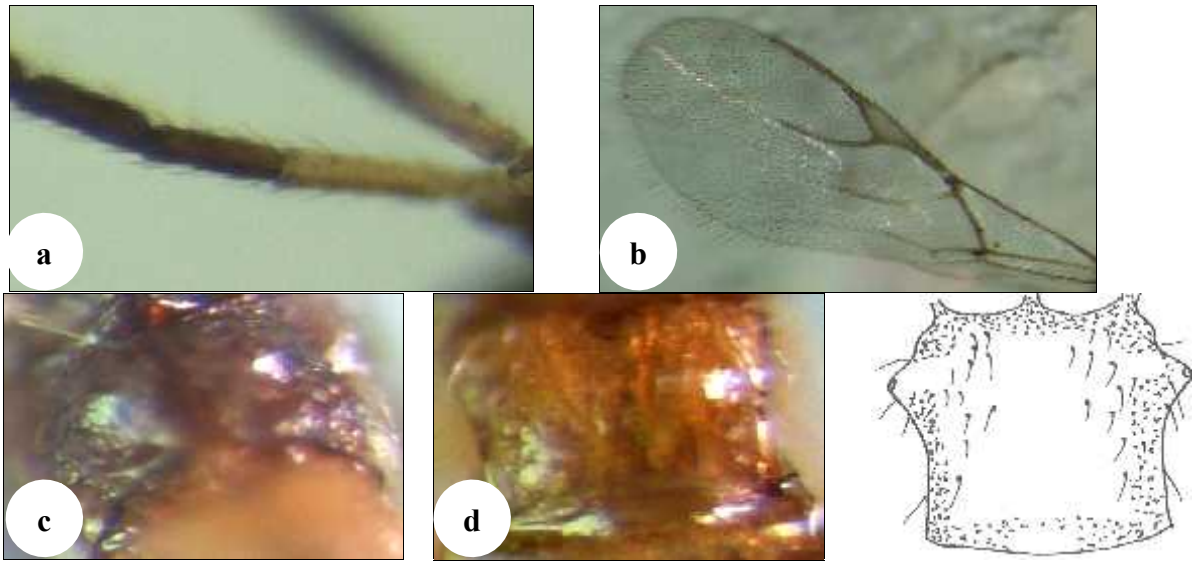
Comments: This species was imported from Peshawar (NWFP) Pakistan in 1977, being reared for biological control of *Schizaphis graminum* at University of Missouri-Columbia and Oklahoma State University, Stillwater. Now during present studies, this species was collected from Rawalpindi (Punjab) and indicated its distribution in Punjab Province of Pakistan also. This species is recorded for the first time from the Punjab province of Pakistan. It indicates distribution of this species in Punjab Province of Pakistan also.

***Proan volucre* (Haliday), 1833:** *Aphidius* (*Proan*) *volucris* Haliday, A. D., 1833. Ent. Mag., 1: 484.

Diagonistic Characters: Antennae 17 segmented. Mesoscutum with distinct notaulics and dense hairs except laterally (Fig. 2b). Propodeum twice as wide as long at spiracles with dense hairs (Fig. 2d).Wing Pterostigma 3.5 times as long as wide and 1/3 longer than metacarp. Tergite-1 subquadrate, about 1.2 times as long as wide at spiracles and with distinct central carinae (Fig. 2c)

Material Examined: *Acrthosiphum pisum* on *Pisum sativum*, Rawalpindi, 29-iii-05, 2♀ and 1♂, 29-iii-06, 2♀ and 1♂; Islamabad, 25-iii-05, 1♀; Chakwal, 29-iii-05, 3♀ and 1♂.

Comments: This species was reviewed by from Pakistan on *Hylopterus pruni* (Geoffroy) and *Acrthosiphum pisum*. In present study new localities records have been added. Specimens collected from Pakistan were compared with description given by Raychaudhuri (1990).They were found to be morphologically similar.



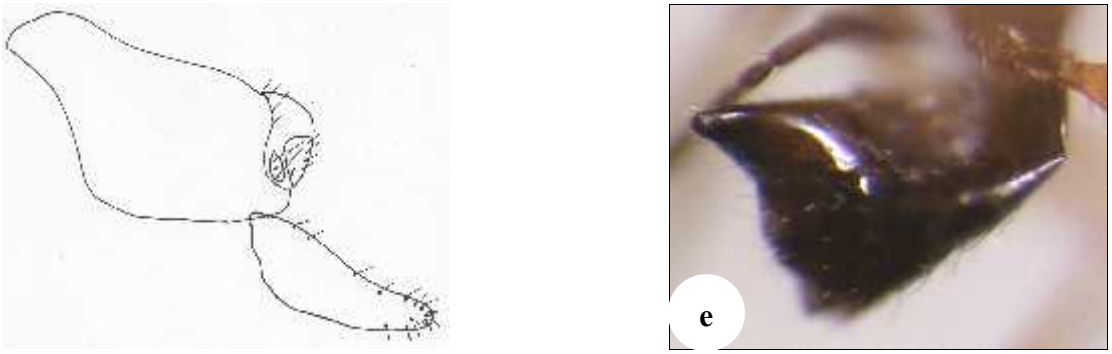


Fig. 1: ***Praon pakistanicum*** **a: F_1 and F_2 b: Forwing; c: Propodeum; d: Tergite-1; e: Ovipositer**

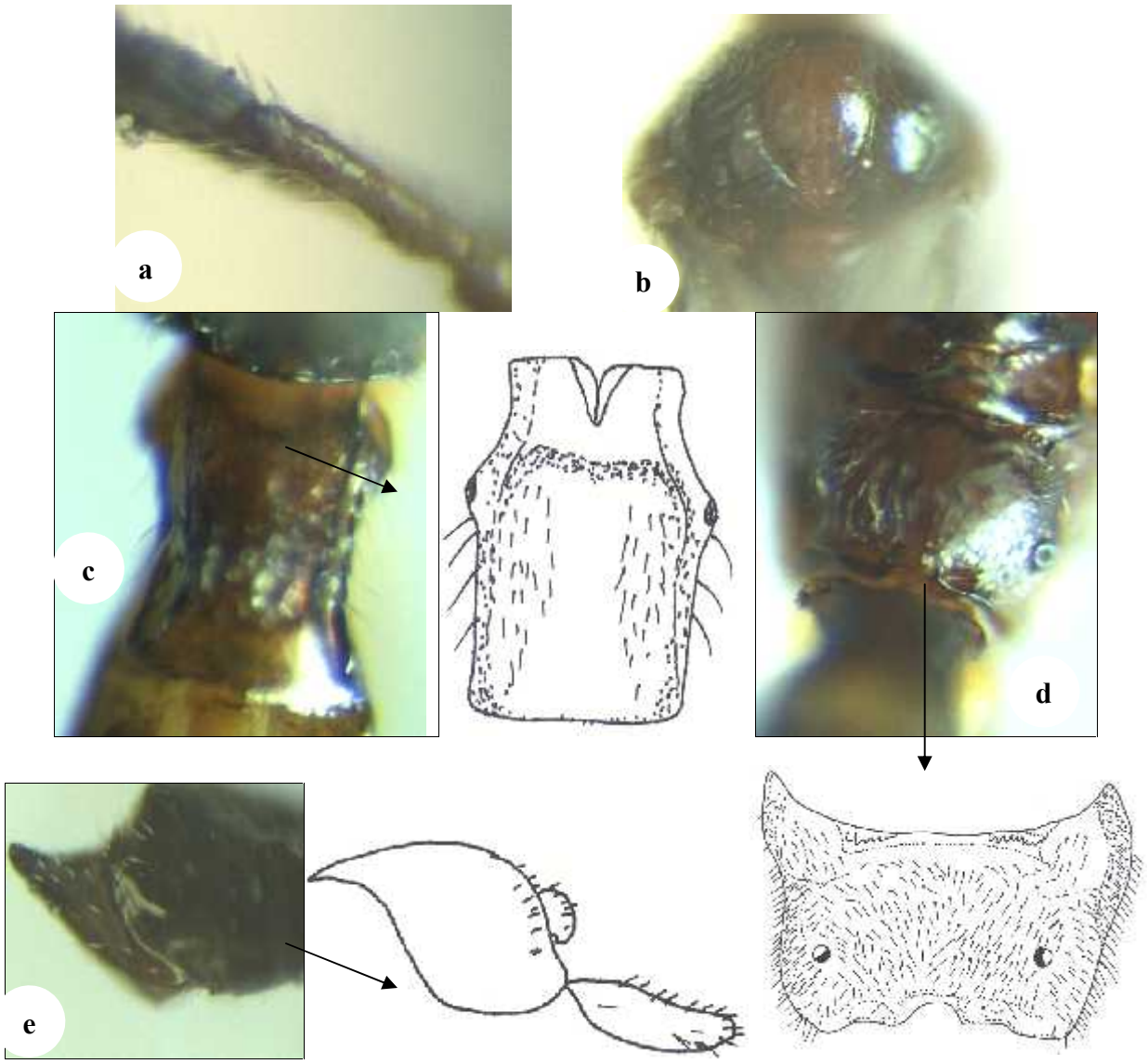


Fig. 2: ***Proan volucre*** **a: F_1 and F_2 b: Mesoscutum with distinct notaulics; c: tergite -1; d: Propodeum; e: Ovipositor sheath**

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