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FIRST RECORD OF THREE SPECIES OF GENUS *POLISTES* (VESPIDAE: HYMEMOPTERA) FROM DISTRICT LAYYAH (PUNJAB), PAKISTAN

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ABSTRACT

Three species of Genus *Polistes* (Vespidae: Hymenoptera) are reported for the first time from different localities of district Layyah (Punjab), Pakistan. Main identification characters, distribution and micrographs have been provided for future field and research identification.

Keywords: Hymenoptera, Vespidae, Genus *Polistes*, Layyah, Punjab

INTRODUCTION

Wasps (Vespidae: Hymenoptera) are commonly known as hornets, potter wasps, paper wasps or yellow jackets. They are the chief predators of the larvae of insect pests feeding on a variety of agricultural crops (Das and Gupta, 1989). In terrestrial environments, they fill the niche roles of scavengers, pollinators, and the bio-control agents (Fateryga, 2009). Paper wasps belong to the subfamily Polistinae and tribe Polistini. In Pakistan, the occurrence of species belonging to genera *Polistes* Latrielle 1802 and *Ropalidia* Guerin has been observed previously (Das and Gupta, 1989). Genus *Polistes* Latrielle is the only one distributed worldwide and the most abundant of all the social vespids. They are generally docile if left undisturbed and considered as beneficial due to their predation of the larvae of Lepidopteran insect pests (Kishore *et al.,* 2012).

Following species of wasps belonging to *Polistes* Latrielle have been reported from Pakistan: *Polistes wattii* (Cameron), *P. olivaceus* (De Geer), *P. rothneyi carletoni* (van der Vecht) and *P. indicus* (Stolfa) from Pothwar region of Punjab, Pakistan (Siddiqui et al., 2015). Additionally *P. dominula* (Christ, 1791), *P. nimpha* (Christ, 1791), *P. biglumis* (Linnaeus, 1758), *P. gallicus* (Linne, 1767) and *P. Quadricingulatus* were recorded by Gusen Leitner (2006) and Dvorak (2007).In continuation to our previous work (Siddiqui et al., 2015; Bodlah et al., 2015) on Vespidae, various localities of district Layyah were surveyed during 2014-15 which resulted in three species of this Genus *Polistes* as first records from Southern part (Layyah) of the Punjab Province.

MATERIALS AND METHODS

Collection of wasp specimens was performed from various areas of Layyah district during two years period (2014-15). All techniques used for the collection, spreading, tagging and preservation of the specimens were followed using methodology of Siddiqui et al. (2015). Morphological characters were observed on pinned and dried specimens under a stereomicroscope. Photographs of specimens were taken by Labomed stereoscope (CZM6) with mounted digital camera (CE 990, eCAM 3000) for identification. All images were captured and recorded using Digi-Pro 4.0. Identification of the specimens up to the specie level was done using the literature of Das & Gupta (1989). After identification, the specimens were deposited in Biosystematics Laboratory, Department of Entomology, PMAS Arid Agriculture University, Rawalpindi (Pakistan).

RESULTS

During 2014-15, our surveys resulted in three species of Genus *Polistes* which were identified using identification characters as described earlier (Das and Gupta, 1989).

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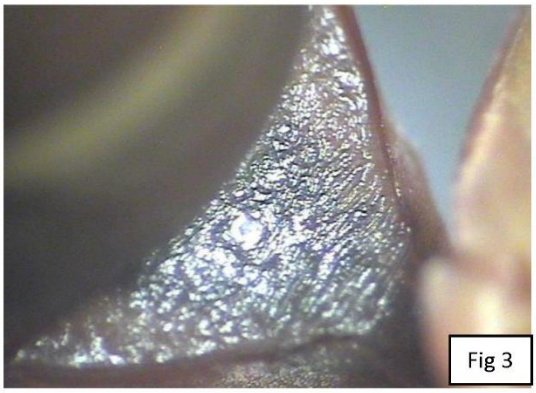


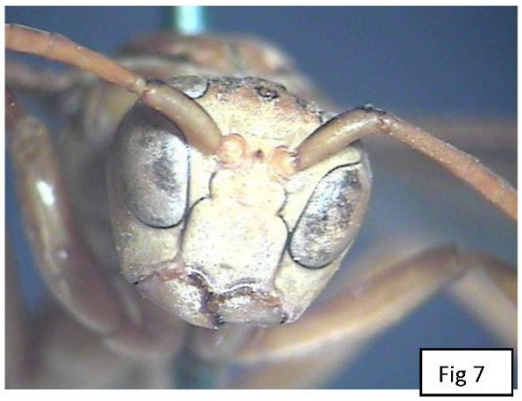
Figures 1-6: *Polistes indicus,* ♀. 1 Dorsal view complete. 2. Head, frontal view. 3. 1st gastral sternite (with basal margin). 4. Mesosoma, lateral view. 5. Habitus. 6. Metasoma, lateral view.

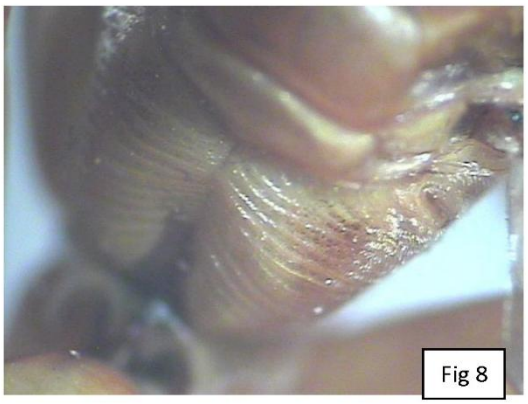
Identification Characters:

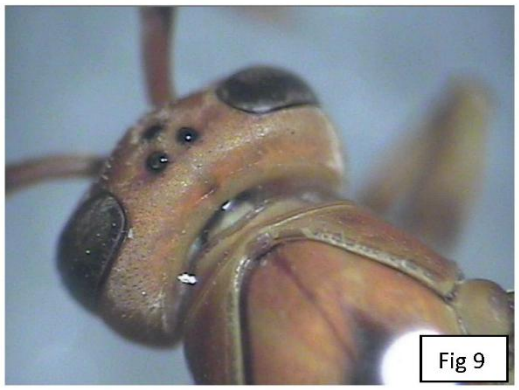
Male: Body yellowish-brown body (Fig. 1) covered with fine silvery pubescence. Antennae reddish orange except for a black mark on the scape above (Fig. 2) and a spot on the second and third antennal segments. Inter-antennal space with a distinct carina; interocular distance much more on vertex than at clypeus; interocellar distance 2x the diameter of posterior ocellus. Head wider than high and also wider than thorax. Eye margined with a carina behind; antenna less far from eyes than from each other. Pronotum, mesoscutum, mesopleuron behind epicnemial carina granulose. Mesopleuron with poorly to well-developed epicnemial carina. Dorsal and ventral metapleuron with fine irregular striations. Propodeum with strong striations; gaster with fine punctures. First gastral sternite with a margin at the base (Fig. 3).

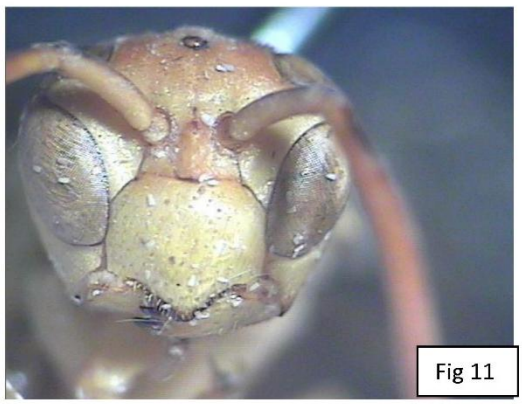
Female: Smaller in size but very similar to males.

Materials Examined: Layyah city, 27-vii-14, 5♀ and 2♂; Kot Sultan, 1-vii-2015, 1♀ and 2♂; Fateh pure, 27-vi-14, 3♀ and 1♂; Chok Azam, 1-vii-2014, 6♀ and 3♂: Karor lal esan, 1-iv-2015, 2♀ and 1♂.









Figures 7-11: 7-8.*Polistes rothneyi* ♂.1. Head, frontal view (Clypeus touching inner eye margin). 2. Propodeum with strong transverse striations. 9-10. *Polistes rothneyi* ♀. 9. Head. Dorsal view. 10. Dorsal view complete. 11. Head, frontal view.

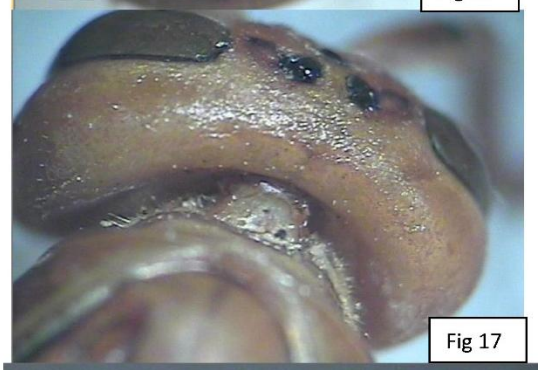
Identification Characters:
This species can be separated from other species of this genus by the presence of distinctly defined ventral edge of the mesepisternum; temple wider than eye in profile; male apophyses longer than wide, with some pubescence.

Female: Head as wide as high seen in front view. Clypeus 1.13-1.22x as wide as long, densely finely punctate, in between scattered larger punctures. Vertex behind posterior ocelli, temple almost impunctate. Vertex up to posterior ocelli with scattered fine punctures. Interocular distance 1. -1.11x as long as clypeus as on vertex. Temple about as wide as eye in profile; malar space with scattered moderately larger punctures. Occipital carina complete. Pronotum with scattered fine punctures; mesoscutum, scutellum sparsely finely punctuate. Mesepisternum behind epicnemial carina and above dorsal episternal groove almost entirely with scattered fine to moderately close deep punctures. Mesepimeron finely punctate; dorsal metapleuron almost impunctate (sometimes with a few regular incomplete striations), in between a few superficial punctures. Propodeum with strong striations

witch reach the inner margins of the sides, lateral edge of propodeum distinct (Fig. 8). First gastral tergite about 1.1x as wide as long and with distinct striations.

Male: Almost similar to female but differs as follows: Clypeus touching eye margin (Fig. 7); ocellocular distance slightly less than 2x as long as inter-ocellar distance. Male sub genital plate produced into a blunt tubercle on each side, apophyses longer than wide; narrow, with a few hairs at apex.

Materials Examined:
Layyah city, 2-vii-14, 1♀; Jaman Shah, 1-vii-2015, 2♂; Fateh pure, 27-vi-14, 3♀ and 1♂; Chok Azam, 1-vii-2014, 6♀ and 3♂: Karor lal esan, 1-iv-2015, 2♀ and 1♂.



Figures 12-19: 12-17. *Polistes olivaceus*♂. 12. Dorsal view, complete. 13. Head, dorsal view. 14. Head, frontal view (clypeus not touching inner eye margin). 15. Apical gastral sternite with a pair of blunt tubercles. 16. 1st gastral sternite. 17. Head showing occipital carina.18-19. *Polistes olivaceus* ♀.18Head + Mesosoma, dorsal view. 19. Head + mesosoma, lateral view.

Identification Characters:
This species is characterized by an incomplete occipital carina (Fig 17); apophyses of male subgenital plate flattened and spatulate at apex, shiny and devoid of pubescence; and color pattern variable.

Female: Head wider than high. Clypeus 1.1x as wide as long, densely finely punctate, with a few larger scattered punctures interposed.Mandibles with a few scattered larger punctures. Interantennal space and inner orbit containing ocular sinus almost smooth.Vertex with a fine scattered punctures. Ocellocular distance about 3x (11:4) the interocullar distance, the latter as long as the diameter of the posterior ocellus. Temple with a few scattered punctures. Malar space with moderately larger and close punctures.Occipital carina incomplete.Pronotum sparsely finely punctuate. Scutellum, postscutellum and metapleuron impunctate. Mesopleuron behindepicnemial carina and above sternopleural suture with scattered fine punctures. Propodeum with distinct striations which do not reach the inner margin on side, without distinct lateral edge, median groove narrower. First gastral sternite finely striate without a margin at base (Fig 16).

Male: Similar to females but clypeus not touching the eye (Fig. 14). Temple wider, proximal tooth of mandible short, apical antennal segment 2x, as long as wide at base, apical gastral sternite with bluntly projecting tubercle on each side (Fig. 15), apophyses long, narrow, and flattened at apex like a spatula.

Materials Examined:
Pahar Pure, 13-v-14, 3♀ and 1♂; Jaman Shah, 1-vii-2014, 1♀ and 5♂; Fateh pure, 27-vii-15, 1♀ and 3♂; Chok Azam, 1-v-2015, 2♀ and 2♂: Layyah City, 1-iv-2014, 5♀ and 6♂.

DISCUSSION

These three species were collected from various habitats like near water sources, flowers, trees, crops, houses etc. These species are very common in various localities of District Layyah. Specimens collected were compared with the published description by Das and Gupta, (1989) and found similar except miner size and colour variations due to the presence of various habitats for wasps as Layyah is multi-crop area with a lot of floral and faunal diversity. These studies are addition to previous studies as done by Siddiqui et al. (2015) in Pothwar region. District Layyah is located in Thal region of the Punjab Province so current studies are new distributional records for the *Polistes* (Vespidae: Hymenoptera).

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