

NEW LOCALITY RECORDS OF *VESPULA FLAVICEPS* (VESPIDAE: HYMENOPTERA) IN MURREE (PUNJAB)

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ABSTRACT

Vespula flaviceps is reported for the first time from different localities of Murree hills Punjab Province of Pakistan during 2014-15. The main identification characters, measurements of various body parts, distribution range supported by GPS positions and micrographs have been given for future field and research identification.

Keywords: Hymenoptera, Vespidae, *Vespula flaviceps*, Murree

INTRODUCTION

Wasps (Vespidae: Hymenoptera) play a significant role in terrestrial ecosystems viz., as bio-control agents, scavengers, invasive pests and pollinators (Fatergya 2009; Rasnitsyn and Quicke, 2002). Vespidae is a cosmopolitan family of wasps with approximately 5000 species worldwide (Aguar et al., 2013). These vespid wasps are solitary, social and eusocial. There are six subfamilies under Vespidae namely Masarinae, Eumeninae, Polistinae, Stenogastrinae, Euparagiinae and Vespinae (Carpenter 1982; Pickett and Carpenter, 2010). The Vespinae consists of the most fearsome wasps, the yellow jackets and true hornets. These yellow jackets scavenge dead insects, earthworms and other carrion including garbage. This sub-family comprises of four genera: *Dolichovespula*, *Provespa*, *Vespa* (Hornets) and *Vespula* (Yellow-jackets), makes total of 71 species worldwide (Barthélémy, 2008; Kimsey & Carpenter 2012). The genus *Vespula* comprises of 22 species worldwide, mostly present in temperate regions of Northern hemisphere. They are expert flyers with small size and yellow/black markings (Greene, 1991).

In Pakistan, various workers have done work on these wasps like Chaudhary et al. (1966); Das and Gupta (1989); Gusenleitner (2006); Gusenleitner (2007); Aziz, 2008; Bodlah et al., 2011 and 2012 and Siddiqui et al., 2015. Dvorak (2007) described *Vespula flaviceps* for the first time from northern Pakistan. Mehmood et al. (2012) reported 3 species of genus

Vespula from various localities of Khyber Pakhtunkhwa, Pakistan. Ali et al. (2013) described 1 species of *Vespula* as pollinator from Haripur (KPK) Pakistan. During current studies, *Vespula flaviceps* is reported for the first time from different localities of Murree.

MATERIALS AND METHODS

Wasps were collected from various localities of Murree region during 2014-15. Collection, setting, tagging and preservation of specimens was done using methodology of Siddiqui et al. (2015). The photographs of specimens were taken by a Nikon D3200 DSLR and the Labomed stereoscope (CZM6) with mounted digital camera (CE 990, eCAM 3000) used for identification. Digi-Pro 4.0 software was used to capture and record the images. Measurements were taken with the help of common scale. The specimens were identified up to species level by using taxonomic literature by Mahmood *et al.* (2012). After identification, the specimens were deposited in Biosystematics Laboratory, Department of Entomology, PMAS Arid Agriculture University, Rawalpindi (Pakistan).

RESULTS AND DISCUSSION

Genus *Vespula* Thomson, 1869

This primarily Holarctic and Oriental genus is comprised of 26 species (Carpenter and Kojima, 1997; Eck, 1998; Dong *et al.*, 2002, 2004; Dong *et al.*, 2005), 13 of which occur in North America (11 in the northeast) (Buck *et al.*, 2008).

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Vespula flaviceps* (Smith in Horne & Smith, 1870)Vespa japonica* de Saussure, 1858*Vespa flaviceps* Smith, 1870

"Vespa Lewisii, Sauss. Guêpes Soc. (MS.)" Smith, 1873

Vespa "lewisii", Saus. MS." Cameron, 1903*Vespa Saussurei* Schulz, 1906,*Vespa karenkona* Sonan, 1929*Vespa 4-maculata* Sonan, 1929*Vespa vulgaris* var. *flavior* Stolfa, 1934*Vespula japonica pionganensis* Giordani Soika, 1976*Vespa vulgaris* var. *flavitor*; Das and Gupta, 1984 (1983)*Vespula gracilia* Lee, 1986**Diagnostic Characters: Female (Fig.1a):**

Third mandibular tooth straight or nearly so along the mesal margin. Occipital carina different in upper 3/4 of gena in worker female is less developed. Space between lateral ocelli more than half width of lateral ocellus. Cubital vein IIa is equal or little longer than IIb. Weak punctation on thorax. Propodeum smooth and devoid of medio-basal carina. Body black with yellowish orange markings. The marking of ocular sinus almost straight or arched on medial margin. Black mark on clypeus is not developed, not reaching the lower margin of the clypeus. Mid and hind tarsi is pale brown. Female have six abdominal segments.

Male (Fig.1b): Occipital carina different only in upper 3/5. Antennae devoid of tyloides; terminal segment not curved, slender. A flat apical lobe at last gastral tergite. White area of ocular sinus not concave on the medial margin. Triangular black spot at base, absent in mandibles. Abdomen divided in to seven segments.

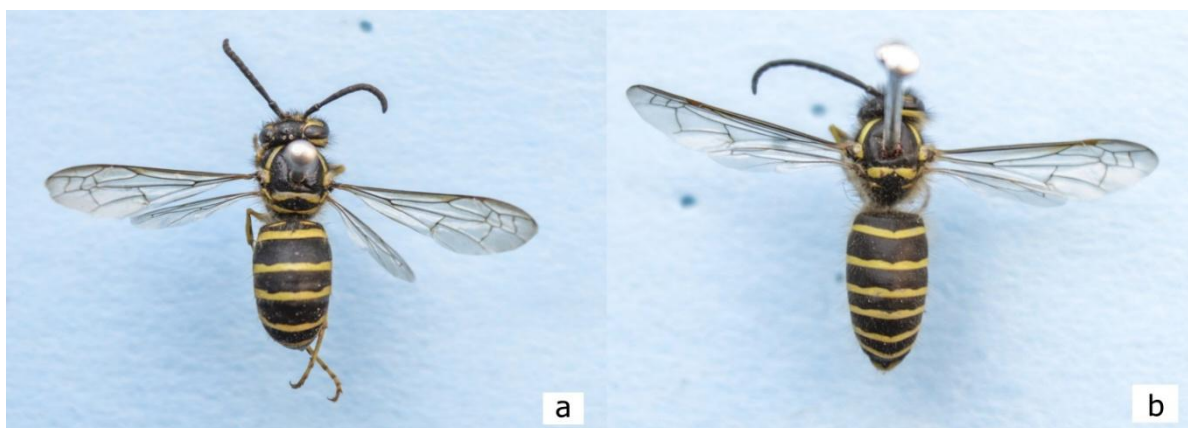
Figure 1. *Vespula flaviceps*, Dorsal view, (a) Female, (b). Male

Female: Body length 12–17 mm, fore wing length 10–12 mm, Head width 3.5–4 mm, Thorax width 3–4 mm, Abdomen width 4–5 mm, Antennal length 6–7 mm.

Male: Body length 13 mm, fore wing length 11 mm, Head width 3.3 mm, Thorax width 3 mm, Abdomen width 3 mm, Antennal length 7 mm.

Material examined. PAKISTAN: Punjab: Murree: 1 ♀, N33°46.789' E073° 14.237', 2155 ft. elev., 28-xi-2014; 2 ♀, N33° 48.117' E073° 15.758', 2359 ft. elev., 28- xi -2014; 1 ♂ and 1 ♀, N33° 48.387' E073° 16.152', 2479 ft. elev., 28- xi -2014; 1 ♀, N33° 49.956' E073° 17.189', 3005 ft. elev., 28- xi -2014; 2 ♀, N33° 53.749' E073° 21.952', 5718 ft. elev., 28- xi -2014; 2 ♀ and 3 male, N33° 55.016' E073° 23.699', 6415 ft. elev., 28- xi -2014; 1 ♀, N33° 56.492' E073° 26.755', 6393 ft. elev., 28- xi -2014; 3 ♀ and 1 ♀, N33° 59.652' E073° 28.793', 4980 ft. elev., 28- xi -2014; 4 ♀, N33° 50.851' E073° 22.982', 4303 ft. elev., 28- xi -2014; 1 ♀ and 1 ♀, N33° 55.341' E073° 24.216', 6302 ft. elev., 09-i-2015; 1 ♀, N33° 59.342' E073° 28.573', 5020 ft. elev., 09-i-2015; 2 ♀, N33° 48.383' E073° 16.156', 2345 ft. elev., 09-i-2015; 1 ♀, N33° 57.141' E073° 27.218', 6117 ft. elev., 09-i-2015; 1 ♀, N33° 49.753' E073° 17.282', 2869 ft. elev., 09-i-2015.

Distribution. Pakistan, China, Korea, India, Japan, Myanmar, Thailand, Nepal, Russia and Taiwan (Carpenter and Kojima, 1997; Dvorák, 2007; Mehmood *et al.*, 2012).



Comments. Specimens collected from Pakistan were compared with the published description of *Vespula flaviceps* by Mehmood *et al.* (2012). This species is recognized on the basis of Pronotal carina incomplete. Vertex is small, posterior ocelli about as far from each other as from the back of the head. On the fore wings, Rs vein meeting R+ Sc vein near the stigma. It is reported for the first time from different altitude and latitude of Murree, Punjab. Mehmood *et al.* (2012) reported this species Khyber Pakhtunkhwa, Pakistan. Wasps of this species were observed on various flowers and standing water reservoirs. Maximum population was observed on water reservoirs

REFERENCES

- Aguiar AP, Deans AR, Engel, MS, Forshage M, Huber JT, Jennings JT, Johnson NF, Lelej AS, Longino JT, Lohrmann V, Mikó I, Ohl M, Rasmussen C, Taeger A, and Yu DSK, 2013. Order Hymenoptera Linnaeus, 1758. In: Zhang, Z.-Q. (Ed.), Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness. *Zootaxa*, 3703 (1): 1–82.
- Ali S, Shehzad A, Rafi MA and Zia A, 2013. Insect pollinators of litchi from district Haripur, Pakistan. *Pak. J. Agric. Res.*, 26(3):220-229.
- Barthélémy C, 2008. Provisional Guide to the Social Vespids of HongKong (Hymenoptera: Vespidae). On line: http://insectahk.com/book_page.html.
- Bingham CT, 1897. Fauna of British India, including Ceylon and Burma, Hymenoptera, Wasps and bees. Taylor and Francis, London, 579 pp.
- Bodlah I, Bodlah MA, Akhtar T, Naeem M and Khan MR, 2011. Record of *Delta dimidiatipenne* (Saussure, 1852) (Hymenoptera: Vespidae: Eumeninae) from Barani areas of Punjab province of Pakistan. *Pak. J. Zool.*, 43(5):1018–1020.
- Bodlah I, Naeem M, Khan MR, Bodlah MA and Akhtar T, 2012. Genus *Delta* de Saussure (Hymenoptera: Eumininae: Vespidae) From Punjab Province of Pakistan. *Pak. J. Zool.*, 44(3):759–764.
- Buck M, Marshall SA and Cheung DK, 2008. Identification Atlas of the Vespidae (Hymenoptera, Aculeata) of the northeastern Nearctic region. *Can. J. Arthr. Identification*, 5:1–492.
- Chaudhry GU, Chaudhry MI and Khan SM, 1966. Survey of insect fauna of forests of Pakistan. Pakistan Forest Institute, Peshawar, 167 pp.
- Carpenter JM and Kojima J, 1997. Checklist of the species in the subfamily Vespinae Insecta: Hymenoptera: Vespidae). *Natural History Bulletin of Ibaraki University*, 1: 51–92.
- Carpenter JM, 1982 "1981". The phylogenetic relationships and natural classification of the Vespoidea (Hymenoptera). *Syst. Entomol.*, 7: 11–38.
- Das BP and Gupta VK, 1989. The social wasps of India and the adjacent countries. *Oriental Insects Monograph*, 11, 1–292.
- Dong D, Liang X, Wang Y and He Y, 2005. A new species of the genus *Vespula* (Hymenoptera: Vespidae) from Gongshan Yunnan, China. *Entomotaxonomia*, 27: 65–68.
- Dong D, Wang Y, He Y and Wan R, 2002. A new species of *Vespula* (Hymenoptera: Vespidae) from Yunnan China. *J. Southwest Agric. Uni.*, 24: 396–397.
- Dong D, Wang Y, He Y and Wang R, 2004. A new species of the genus *Vespula* (Hymenoptera: Vespidae) from Nujiang of Yunnan Province. *J. Southwest Agric. Uni.*, 26: 146–147.
- Dvořák L, 2007. The social wasp fauna of Pakistan (Hymenoptera, Vespidae). *Linzer Biologische Beitrage*, 39 (1): 51–55.
- Eck R, 1998. Eineneue Art der *Vespula vulgaris*-Gruppe aus Asien (Insecta: Hymenoptera: Vespidae). *Reichenbachia*, 32: 299–322.
- Fateryga AV, 2009. Trophic relations between vespid wasps (Hymenoptera: Vespidae) and flowering plants in the Crimea. *Entomol. Rev.*, 9 (6): 698–705.
- Greene A, 1991. *Dolichovespula* and *Vespula*, "The Social Biology of Wasps"; Ed, K.G. Ross & R. W. Matthews; Cornell University Press.
- Gusenleitner J, 2006. Uber Eumeninae, aufgesammelt in Pakistan (Hymenoptera: Vespidae). *Linzer Biologische Beiträge*, 38 (2), 1295–1305.
- Gusenleitner J, 2007. Uber Vespidae aus Pakistan (Hymenoptera: Vespidae). *Linzer Biologische Beiträge*, 39 (2), 969–972.
- Kimsey LS and Carpenter JM, 2012. The Vespinae of North America (Vespidae, Hymenoptera). *J. Hymeno. Res.*, 28: 37–65.

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- Mahmood K, Ullah M, Aziz A, Hasan SA and Inayatullah M, 2012. To the knowledge of Vespidae (Hymenoptera) of Pakistan. *Zootaxa*, 3318, 26–50.
- Pickett KM and Carpenter JM, 2010. Simultaneous analysis and the origin of eusociality in the Vespidae (Insecta: Hymenoptera). *Arthropod Syst. Phylo.*, 68: 3–33.
- Rasnitsyn AP and Quicke DLJ, 2002 *History of insects*. Kluwer Academic Publishers,

Asian J Agri Biol, 2015, 3(1): 46-49.

- Dordrecht, Boston, London, 517 pp.
- Siddiqui JA, Bodlah I, Carpenter JM, Naeem M, Ahmad M and Bodlah MA, 2015. Vespidae (Hymenoptera) of the Pothowar region of Punjab, Pakistan. *Zootaxa*, 3914(5): 501–524.
- Yamane SK, Wagner RE and Yamane S, 1980. A tentative revision of the subgenus *Paravespula* of eastern Asia (Hymenoptera: Vespidae). *Ins. Matsum.* 19: 1–46.