



Research Paper

New record of Red & Black Potter Wasp *Delta dimidiatipenne* (de Saussure, 1852) (Hymenoptera: Vespidae: Eumeninae) from Niwari district, Madhya Pradesh (India), with systematic account, distribution and other Indian *Delta* spp.

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Abstract: New record of *Delta dimidiatipenne* (de Saussure, 1852), the Red & Black Potter Wasp, belonging to subfamily Eumeninae, under family Vespidae, from Niwari district, Madhya Pradesh, India, with its systematic account, distribution, habitat, food & feeding, nest building, egg laying, self-defense and as potential pest controller.

Keywords: New record, *Delta dimidiatipenne*, Niwari, Prithvipur, Madhya Pradesh

Introduction:

The potter wasps (Eumenine: Vespidae) of India, belonging to genus *Delta* de Saussure, 1855, have been studied by various workers during the past, viz. de Saussure, 1852; Smith, 1857; Giordani Sokia, 1979; Gupta,

1997, 2003; Tiwari et al., 2004; Girish Kumar, 2012; Srinivasan & Girish Kumar, 2010, 2013; Girish Kumar & Sharma, 2014, 2015; Pannure et al., 2016; Sheikh et al., 2017; Rajmohana et al., 2018; Gawas et al., 2020 and Girish Kumar et al., 2020 (genus *Delta* de Saussure, 1855).

As regards Madhya Pradesh fauna, very little is known on Eumeninae, except for a record of *Delta dimidiatipenne* (de Saussure, 1852), the Red & Black Potter Wasp, from Dumna National Park, Jabalpur by Sheikh et al. (2017). Recently, a good specimen of the same was sighted at Prithvipur, district Niwari (M. P.) and recorded here as second find from the state with its systematic account distribution and other aspects.

Study Site: Prithvipur, district Niwari, Madhya Pradesh. India.

Physiography: Prithvipur (25°11'7"N, 78°39'54"E) is a town in Niwari district under Sagar division, located in northern part of Madhya Pradesh, bounded by Tikamgarh district to south and west, Jhansi and Mahoba districts of Uttar Pradesh to north and east. River Betwa, the main water source, passing through it.

Climate: Characterized by a local steppe climate (semi-arid), featuring hot, dry summers, a humid monsoon season and cool, pleasant winters. Average daytime temperatures range from 38°C to 45°C, with blistering 48.7°C during peak summer heatwaves. In winters daytime temperatures average around 20°C to 25°C, while nights quite chilly, with minimum temperatures dipping down to 5°C to 9°C during December-January. As regards monsoon it receives vast majority of its annual rainfall during July-September.

Flora: Typical of tropical dry deciduous and thorn forests with Babul (*Acacia nilotica*), Dhok (*Anogeissus latifolia*), Tendu (*Diospyros melanoxylon*), Mahua (*Madhuca longifolia*), Teak (*Tectona grandis*), the main trees, besides hardy local shrubs, thorny bushes and seasonal grasses that thrive well in dry terrain and rocky outcrops.

Systematic Account, Distribution and Other Aspects:

***Delta dimidiatipenne* (de Saurssure, 1852)**
Eumenes dimidiatipennis de Saussure, 1852. *Et. Fam. Vesp., Mon. Guep. Sol.*, 1: 51, pl. 8, fig. 5 (female, male) (syntypes; type-locality: Saudi Arabia (Djidda); Egypt; India [Punjab]), Smith, 1857. *Catalogue of Hymenopterous Insects in the collections of the British Museum*, Part 5, Vespidae: 25; Bingham, 1897. *Faun. Brit. India, Hymenoptera*, 1: 342 (female, male); Kirby,

1903. *Insecta: Hymenoptera*. In: Forbes, H. O. (Ed.): 233-260; Guichard, 1986. *Faun. Saudi Arabia*, 7: 203-229; Walker & Pittaway, 1987. *Insects of Eastern Arabia*: 191pp; Gupta, 1997. *Faun. Delhi, State Fauna Series*, 6: 423, 430; Tiwari et al., 2004. *Conservation Area Series*, 19: 92-96. *Eumenes transcaspicus* Morawitz, 1895. *Horae Societatis Entomologicae Rossicae*, 29: 414. *Eumenes* var. *maxillosus dimidiatipenne*, Schulthess, 1910. *Societas Entomologica*, 25 (5): 17. *Delta dimidiatipenne*, Bequaert, 1918. *Bull. Amer. Mus. Nat. Hist.*, 39: 59-62; Bluethgen, 1960. *Beitr. Nat. Kdl. Forsch. Sudwestdeutschl.*, 19 (3): 279; Roche, 1981. *Bulletin of the Abu Dhabi Natural History Group*, 15: 12-20; Dvorak & Castro, 2007. *Acta Entomologica Musei Nationalis Pragae*, 47: 230; Srinivasan & Girish Kumar, 2010. *J. Threatened Taxa*, 2 (12): 1316, image 4; Bodlah et al., 2011. *Pakistan J. Zool.*, 43 (5): 1019-1020; Girish Kumar, 2012. *Journal of Environment & Sociobiology*, 9 (1): 43-49; Srinivasan & Girish Kumar, 2013. *Rec. zool. Surv. India*, 113 (1): 117-118; Girish Kumar & Sharma, 2014. *Journal on New Biological Reports*, 3 (3): 241, 249; Girish Kumar & Sharma, 2015. *Journal of Threatened Taxa*, 7 (14): 8096, 8118; Siddiqui et al., 2015. *Zootaxa*, 3914 (5): 507, fig. 18a, b (male); Pannure et al., 2016. *Zootaxa*, 4171 (1): 17; Rafi et al., 2017. *Zootaxa*, 4362 (1): 3; Sheikh et al., 2017. *Rec. zool. Surv. India*, 117 (3): 199, 205-206, fig. 15; Rajmohana et al., 2018. *Faunal Diversity of Indian Himalaya*: 388; Carpenter & Gadallah, 2020. *Zootaxa*, 4754 (1): 196; Gawas et al., 2020. *Zootaxa*, 4784(1): 7-8. *Eumenes maxillosus dimidiatipenne*, Giordani Soika, 1952 (1951). *Revista di Biologia Coloniale*, 11: 77.

Delta emarginatus dimidiatipenne, Bluethgen & Gusenleither, 1970. *Stuttgarter Beitrage Naturkunde*, 223: 6.

Delta dimidiatipennis, Gupta, 2003. Hymenoptera: Aculeata. In: Some Selected Fauna of Asola-Bhatti Wildlife Sanctuary (Delhi). *Fauna of Conservation Area*, 16: 28.

Common Names: Caterpillar Hunting Wasp, Red & Black Potter Wasp, Red-coloured Potter Wasp or Red Potter Wasp.

Classification: Class Insecta Linnaeus, 1758, order Hymenoptera Linnaeus, 1758, infraorder Aculeata Latreille, 1802, superfamily Vespoidea, family Vespidae Laicharting, 1781, subfamily Eumeninae Latreille, 1802, tribe Eumenini, genus *Delta* de Saussure, 1855.

Sighting: 1 example (male); Prithvipur, district Niwari, Madhya Pradesh, India; 10.ix.2026; by 2nd author (AKD).

Diagnosis: Usually solitary, rarely sub-social; head dull red; eyes emarginate or notched; thorax blackish with red markings, with parategula; tarsal claws usually bifid; petiole long and narrow; major part of gaster shiny black; fore-wings greyish, longitudinally folded at rest; hind-wing with anal lobe.

Diagnostic Features:

Female: Clypeus smooth, oval, its anterior margin concave at apex; frons and ocular sinus closely and strongly punctured; antennal pedicel 3-times shorter than flagellum; vertex extending to occiput usually at apex of antennae, vertex and temple with minute punctures; median segment with a median longitudinal furrow, indistinct at base, widening and deepening into a triangular hollow at apex.

Colouration: Antennae reddish with black tips; head predominantly dull red with black markings; clypeus and lower half of frons also dull red; thorax blackish with red

patches; wings rusty, apical half of large fore-wings greyish with purple shine (characteristic feature: when at rest, fold their wings in half lengthwise); legs slender with specialized cleft tarsal claws which help in easy grip on vertical surfaces while constructing mud pots; petiole very narrow (waist like, created by fusion of thorax and first tergite of gaster) dull red, anteriorly black; gaster bulbous, shiny black posteriorly, except for a small red anterior part, beyond petiole; sting also black.

Size: 24-27 mm in length; exp. 52 mm (Bingham, 1897); 24-27 mm (Gupta, 1997; Tiwari et al., 2004; Srinivasan & Girish Kumar, 2013); 24-27 mm in length, forewing length 21.5 mm (Srinivasan & Girish Kumar, 2010); body 26 mm in length, wings 22 mm in length, 3 times longer than wider, longitudinal eye diameter about 1.9 times of transverse eye diameter and 1.2 times of trans-facial line (Bodlah et al., 2011); 20-23 mm (head + mesosoma + abdominal terga, T1+T2) (Girish Kumar & Sharma, 2014); 21 mm (head + mesosoma + abdominal terga, T1+T2) (Girish Kumar & Sharma, 2015; Sheikh et al., 2017).

Male: Almost similar to female, except smaller and slighter with clypeus and lower half of frons bright yellow.

Size: 22-25 mm in length; exp. 46-50 mm (Bingham, 1897); 22-25 mm in length (Gupta, 1997; Tiwari et al., 2004; Srinivasan & Girish Kumar, 2013); 22-25 mm in length, forewing length 16.5 mm (Srinivasan & Girish Kumar, 2010); 19-22 mm (head + mesosoma + abdominal terga, T1+T2) (Girish Kumar & Sharma, 2014).

Sexual Dimorphism: Male generally slenderer and slighter than female and having lower half of frons bright yellow instead of dull red of female.

Distribution:

India: Madhya Pradesh: Jabalpur district (Dumna National Park) (Sheikh et al., 2017); Niwari district (Prithvipur) (present record).

Rest of India: Arunachal Pradesh (Itanagar Wildlife Sanctuary, Papum Pare district), Asola Batti Wildlife Sanctuary, Chhattisgarh (Raipur [Raipur Ganj] and Kabir Dham [Chapri village] districts), Delhi (Masudpur, Vasant Kunj), Gujarat, Punjab, Rajasthan (Desert National Park, Barmer district; Jodhpur [Mandore] and Pali [Gadwada] districts); Trans Himalaya-Ladakh Mountains, Trans Himalaya-Tibetan Plateau, Himalaya-North-west, Himalaya-West and Himalaya-East; Uttarakhand (Chalthi, Almora district) (de Saussure, 1852; Smith, 1857; Giordani Sokia, A., 1979; Gupta, 1997; Gupta, 2003; Tiwari et al., 2004; Girish Kumar, 2012; Srinivasan & Girish Kumar, 2010, 2013; Girish Kumar & Sharma, 2014, 2015; Rajmohana et al., 2018; Girish Kumar et al., 2020).

Other Records: Himachal Pradesh, Jammu & Kashmir UT, Jharkhand, Kerala (Malabar), Maharashtra (Mumbai), Rajasthan (Dausa district); Uttarakhand (Rishikesh, vide Pannure et al., 2016), Uttar Pradesh (vide Pannure et al., 2016) (Gupta, 1997, 2003; Tiwari et al., 2004, Srinivasan & Girish Kumar, 2010, 2013; Girish Kumar & Sharma, 2014; Pannure et al., 2016; Sheikh et al., 2017; Gawas et al., 2020).

Elsewhere: Afghanistan, Africa, Algeria, Arabian Peninsula (Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates and Yemen [including Sokorta]), Bhutan, Cambodia, Canary Islands (El Hierro; Lanzarote, Fuerteventura and Tenerife Islands; Las Palmas de Gran Canaria Island, Maspalomas town) (Introduced and now widespread in the archipelago), Central Africa, Central Sahara, Chad, China,

Djibouti, Egypt, Eritrea, Ethiopia, Hawaii, Hong Kong, Indonesia, Iran, Jordan, Madagascar, Malaysia, Mauritania, Middle-east including Israel (Yoqne-am), Moluccas Islands, Morocco, Myanmar, Nepal, New Guinea, North-west Africa, Niger, Pakistan (Punjab Province), Palestine, Somalia, South Africa, Sudan, Syria, Taiwan, Tajikistan, Turkey, Tunisia, Turkmenistan, Uganda and Vietnam (de Saussure, 1852; Kirby, 1903; Van der Vecht & Fischer, 1972; Roche, 1981; Guichard, 1986; Walker & Pittaway, 1987; Gupta, 1997; Gupta, 2003; Tiwari et al., 2004; Dvorak & Castro, 2007; Lauterbach & Latsch-Lauterbach, 2007; Srinivasan & Girish Kumar, 2010, 2013, Bodlah et al., 2011; Girish Kumar & Sharma, 2014, 2015; Siddiqui et al., 2015; Pannure et al., 2016; Rafi et al., 2017; Sheikh et al., 2017; Carpenter & Gadallah, 2020).

Habitat: Though regarded as a desert/arid species but can be seen in gardens of eastern Arabia (Walker & Pittaway, 1987)

Food & Feeding: Feed on nectar, including that of *Acacia* flowers (Walker & Pittaway, 1987).

Nest Building: Potter wasps as named on characteristic nest building nature, females build a mud nests on walls, house roofs, rocks or tree branches & flowers, by mixing sand or mud in saliva and mould it into a pot-shaped structure with their mouth parts, leaving an opening with a lip hanging downward, with filled with various larval instars (*Helicoverpa armigera* and *Pieris brassicae*).

Egg-laying: When pot mud gets dried out and hardened, female lays a single egg inside and suspend it from roof by a thread of silk; nest also provisioned by female with several caterpillars or various larval instars of like *Helicoverpa armigera* and *Pieris brassicae* inside for its larvae, using her

stinger to hunt and paralyze them which future larva eats during development inside pot chamber.

Self-defense: Generally solitary, non-aggressive and unlikely to sting humans but typically only sting if provoked, grabbed or their mud nest is disturbed or threatened; sting may cause pain with localized redness, mild swelling and discomfort which may be treated by cold pack with some pain relievers or antihistamines, unless an individual has a specific allergic sensitivity.

Pest Controller: Being predatory in nature, feed on caterpillars, grubs and other soft-bodied insects and their larvae, make them natural biological control agents in agroecosystems.

Other Indian Species:

Srinivasan & Girish Kumar (2010, 2013), Girish Kumar & Sharma (2014, 2015), Pannure et al. (2016), Sheikh et al. (2017), Rajmohana et al. (2018), Gawas et al., (2020) dealt with fauna of Arunachal Pradesh, Chhattisgarh, Rajasthan, South India and India respectively and reported a total of 9 species/subspecies in genus *Delta* de Saussure, 1855 under subfamily Eumeninae, viz.

1. *Delta asina* (de Saussure, 1852) from Gujarat (Gawas et al., 2020).

2. *D. campaniforme campaniforme* (Fabricius, 1775) from Uttarakhand (Chalthi, Almora district) (Gawas et al., 2020).

3. *D. campaniforme chloroticum* Giordani Soika, 1979 from Gujarat- type-locality, recte: Giordani Sokia, 1979 (Gawas et al., 2020).

4. *D. campaniforme gracilior* (Giordani Soika, 1986) from Arunachal Pradesh (Itanagar Wildlife Sanctuary, Papum Pare district); Himalaya-Central.

5. *D. conoideum* (Gmelin, 1790) from Arunachal Pradesh (Indira Gandhi Park,

Itanagar, Papum Pare District, Itanagar); Chhattisgarh (Jagadalpur, Bastar district; Kodhmali, Gariabad district; Bardand, Badalkhol, Jashpur district; Rengakhar forest, Boramdeo WLS, Kabirdham district; Kudmura, Korba district; Domarpani, Barnawapara WLS and Lal Bandha pondside, Raipur district); South India (Karnataka) and Rajasthan (Takhat Sagar Lake side, Jodhpur); Himalaya-Central and Himalaya-East.

6. *D. dimidiatipenne* (de Saussure, 1852) from Arunachal Pradesh (Itanagar Wildlife Sanctuary), Chhattisgarh (Chapri village, Kabirdham district; Raipur Ganj, Raipur district), Delhi (Masudpur, Vaant Kunj), Madhya Pradesh (Dumna National Park, Jabalpur), Rajasthan (Mandore Jodhpur district and Gadwada, Pali district), South India (no specimens examined, Pannure et al., 2016); Trans Himalaya-Ladakh Mountains, Trans Himalaya-Tibetan Plateau, Himalaya-North-west, Himalaya-West and Himalaya-East.

7. *D. esuriens esuriens* (Fabricius, 1787) from Andhra Pradesh (Guntur), Arunachal Pradesh (Indira Gandhi Park, Itanagar, Papum Pare district), Chhattisgarh (Jagadalpur, Sonpur & Chitrakoot, Bastar district; Kundraghat, Tamor Pingla WLS, Balrampur district; Achanakmar WLS, Bilaspur district; Kukrel, Dhamtari district; Manda Tengna, Badhalkhol, Jashpur district; Sunwahi forest, Boramdeo WLS, Kabirdham district; Kudmura, Korba district; Khirki, Guru Ghasidas NP, Koriya district; Barbanda, Barnawapara WLS and Lalbandha pond side, Raipur district), Gujarat (AAU Anand), Karnataka (Dandeli; Hebal, Bengaluru), Kerala (Madayipara [Kannur]), Maharashtra (Narayangaon, Pune), Nagaland (Medziphema, Dimapur), Rajasthan (Sujargarh, Churu district; Manjuvas, Ganganagar district; Gudha,

Jhunjhunu district; Bishalpur and Mandore, Jodhpur district), South India (Karnataka, Kerala and Tamil Nadu); Himalaya-North-west, Himalaya-west, Himalaya-Central and Himalaya-East.

8. *D. paraconicum* Giordani Soika, 1972 from Tamil Nadu (type-locality: Donhavur, Tirunelveli) (Giordani Soika, 1972).

9. *D. pyriforme pyriforme* (Fabricius, 1765) from Arunachal Pradesh (Itanagar Wildlife Sanctuary), Chhattisgarh (Chitrakoot, Dashapal, Gariyabahal Nala, Hatguda and Jhiragaon, Jagadalpur, Bastar district; Pingla Nala, Tamor Pingla WLS, Balrampur district; Bacheli and Kirandul, Dandewada district; Barband, Badalkhol, Jashpur district; Duldula forest, Boramdeo WLS and Kherpani Forest, Kabirdham district; Sunhat and Jalpani, Guru Ghasidas NP and Ramgarh, Koriya district; Tinsa Pathar, Pakrid- Barnawapara WLS, Lalbandha pond side, Nawapara and Sarangarh, Gomardo WLS, Raipur district), Maharashtra (Bhimashankar), Rajasthan (Mount Abu, Sirohi district) and South India (Karnataka and Karala); Himalaya-North-west, Himalaya-west, Himalaya-Central and Himalaya-East.

Remarks: Girish Kumar (2013) studied the record of *Delta arcuata* (Fabricius, 1775) from Uttarakhand (Western Doon Shiwalicks, Tiparpur, Dehra Dun) by Gupta (2007) and synonymized with *Phimenes flavopictum* (Blanchard, 1845).

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Figure. *Delta dimidiatipenne* (male)