



A REVIEW OF THE GENUS *CHLORION* LATREILLE, 1802 (HYMENOPTERA: SPHECIDAE) FROM THE INDIAN SUBCONTINENT

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INTRODUCTION

Latrielle (1802) erected the genus *Chlorion* (Hymenoptera: Sphecidae) based on the type species *Sphex lobatus* Fabricius, 1775. This is a widely distributed genus all over the world except Australia and Europe (Bohart & Menke, 1976). Twenty species with additional three subspecies are recorded under this genus worldwide (Pulawski, 2009) of which three species namely *Chlorion lobatum* (Fabricius, 1775), *C. regale* Smith, 1873 and *C. splendidum* Fabricius, 1804 are recorded from the Indian subcontinent. In this paper, the genus *Chlorion* is reviewed with several new distributional records.

MATERIAL AND METHODS

This study is based on about 76 specimens present in the Hymenoptera Section of the Zoological Survey of India, Kolkata, collected from various localities of the Indian subcontinent. The specimens were studied and photographed by using a Leica Stereo microscope with LAS software version 3.6.0. All the specimens were properly preserved and added to the 'National Zoological Collections' of the Hymenoptera Section of the Zoological Survey of India, Kolkata (NZC).

Abbreviations used for the Museums: BMNH = The Natural History Museum, formerly British Museum (Natural History), London, England; NZC = 'National Zoological Collections' of Zoological Survey of India, Kolkata, India; ZMK = Zoological Museum, Copenhagen, Denmark.

Abbreviations used for the terms: H = Head; M = Mesosoma; T1-T2 = Metasomal terga 1 to 2.

RESULTS

Genus *Chlorion* Latrielle, 1802

1802. *Chlorion* Latrielle, 333. Type species: *Sphex lobatus* Fabricius, 1775, by monotypy.

Diagnosis: Claw tooth usually mesal; female clypeus usually with five large teeth, rarely only two or four teeth; antennal sockets contiguous with frontoclypeal suture in female, separated by less than a socket diameter in male; male sterna IV and V at most sparsely setose; second recurrent vein received by third submarginal cell; spiracular groove present; female with a foretarsal rake; propodeum with U-shaped dorsal enclosure defined posterad by a semicircular furrow; body often metallic blue or green.

Distribution: Widely distributed except Australia and Europe.

1. *Chlorion lobatum* (Fabricius, 1775)

(Figs. 1-4)

1775. *Sphex lobatus* Fabricius, 348, sex not indicated (as *lobata*, incorrect original termination). Lectotype: ♀, Africa, actually India or China: no specific locality, designated by Vecht, 1961: 37 (BMNH).

1804. *Chlorion lobatum*: Fabricius, 217 (new combination and redescription by Fabricius).

Diagnosis: Female (Fig. 1). Length (H+M+T1+T2): 19-24 mm. Head, mesosoma and metasoma brilliantly polished, smooth and shining; head and mesosoma with a very few scattered,

shallow punctures; clypeus transverse, very much broader than high (Fig. 2), convex in the middle, its anterior margin wavy and emarginated, with 5 tooth-like structures; propodeum (Fig. 3) long, cylindrical, not much sloped posteriorly, with transverse striations; legs long slender, tibiae and tarsi with spines, the spines long; metasoma petiolate, the petiole short, about the length of metacoxa. Body brilliant bluish green. Antennae, mandible, tibiae below and the tarsi opaque black (sometimes brown); the clypeus and sides of the face with silvery pile.

Male: Length (H+M+T1+T2): 13-18. mm. Similar but smaller and more slender; clypeus triangular, not transverse, convex in the middle, its anterior margin with a rounded arch (in some specimens slightly emarginated at middle) (Fig. 4). Wings in both sexes yellowish hyaline, in certain lights iridescent, the apical margin lightly fuscous; veins brown.

Variation: In some specimens, body with more bluish reflections.

Material examined: INDIA: Arunachal Pradesh: Papumpare district, Kimin, 1 ♂, 9.v.1966, Coll. A.N.T. Joseph & Party, NZC Regd. No. 5689/H3; Papumpare district, Itanagar, 1 ♂, 27.v.2000, K. Bhattacharya & Party, 14749/H3; Papumpare district, Itanagar, ZSI Complex, 1 ♀, 5.v.2003, P.T. Bhutia & Party, 14750/H3. Assam: Udalgiri district, Bhairabkunda, 1 ♂, 20.v.1961, K.C.J., 3301/H3; Golaghat district, Dijoo, Naoboisa Village, 1 ♂, 10.V.1966, A.N.T. Joseph & Party, 5688/H3. Chhattisgarh: Koriya district, Guru Ghasidas National Park, Khirki, 1 ♂, 12.v.2013, A. Raha & Party, 14795/H3; 1 ♂, 12.v.2013, A. Raha & Party, 14796/H3; 1 ♂, 12.v.2013, A. Raha & Party, 14797/H3; 1 ♀, 12.v.2013, A. Raha & Party, NZC Regd. No. 14798/H3; 1 ♀, 12.v.2013, A. Raha & Party, 14799/H3; 1 ♀, 12.v.2013, A. Raha & Party, 14800/H3. Jharkhand: West Singhbhum district, Saranda Forest, 1 ♀, 28.x.1990, S.S. Saha & Party, 14751/H3. Karnataka: Bangalore, 10 ♀, date of collection Unknown, Cameron, 3356/H3, 3358/H3 to 3362/H3, 14753/H3 to 14756/H3; Mysore, 1 ♀, 4.x.1976, Coll. Unknown, 14757/

H3; Coorg, 1 ♀, date of collection Unknown, F. Hannington, 14758/H3. Madhya Pradesh, Shivpuri district, Surwaya, 1 ♂, 16.v.1975, S.K. Gupta & Party, 14759/H3. Meghalaya: East Garo Hills district, Dainadubi, 3 ♂, 13.v.1979, S.B. Roy & Party, 14761/H3 to 14763/H3; 2 ♀, 13.v.1979, S.B. Roy & Party, 14760/H3 & 14801/H3; East Garo Hills district, Darugiri, 1 ♂, 20.v.1979, S.B. Roy & Party, 14764/H3. Nagaland: Naga hills, 1 ♀, date of collection Unknown, Captain Butler, 14765/H3. Odisha: Bhadrak district, Dhamara, 1 ♂ & 1 ♀, date of collection and name of collector Unknown, 14766/H3 & 14767/H3. Tamil Nadu: Theni district, Periyakulam, 1 ♀, ii.1969, O.B. Chhotani, 14772/H3. Tripura: North Tripura district, Manu Riverside, 1 ♀, 10.vi.1988, V.T. Darlong & Party, 14768/H3; South Tripura district, Garjee, 1 ♀, 15.v.1978, J.K. Jonathan & Party, 14769/H3. Sikkim: East Sikkim district, Rangpoo, 1 ♀, 3.x.1993, B.N. Das & Party, 14770/H3; 1 ♀, Dudgeon, Oct.1897, 14771/H3. Uttarakhand: Rudrapur district, Khantra, 1 ♀, 27.vi.2004, S.K. Chakraborty & Party, 14773/H3. Uttar Pradesh: Lakhimpur kheri district, Mailani, 1 ♀, 30.iv.2008, Coll. Unknown, 14774/H3; Mirzapur district, Rihand River (Dam Site), 1 ♀, 13.iv.1947, H.A. Hafiz, 14775/H3. West Bengal: Kolkata, 1 ♂, 25.v.1909, Coll. Unknown, 14776/H3; Jalpaiguri district, Alipurduar, Samuktala, 1 ♂, 26.iv.1986, Coll. B.C. Das & Party, 14777/H3; Murshidabad district, 1 ♀, 1921, Dover, 14778/H3; Kolkata, 1 ♀, 26.iii.1907, Coll. Unknown, 14779/H3; Kolkata, 1 ♀, 1.vi.1907, Coll. Unknown, 14780/H3; Kolkata, Eden Garden, 1 ♀, 7.v.1965, A.N.T. Joseph, 14781/H3; Kolkata, Dhapa, 1 ♂, 5.v.1961, H.N.S., 14782/H3; Darjeeling district, Takdah, 1 ♀, 24.iii.1973, P.K. Maity & Party, 14783/H3; Midnapore district, Tamluk, 1 ♀, 10.vi.1975, S.K. Banerjee & Party, 14784/H3; Murshidabad district, Farakka, 1 ♀, 14.v.1975, S.K. Banerjee & Party, 14785/H3; Kolkata, 1 ♀, 4.vi.1907, Coll. Unknown, 14786/H3; Darjeeling, 1 ♀, 27.iv.1986, B.C. Das & Party, 14802/H3. MYANMAR: Tenasserim, 1 ♀, date of collection and name of collector Unknown, 14787/H3, Tenasserim Valley, 1 ♀, date of collection Unknown, W. Doherty, 14788/H3, Yenangyaung

Megwe, 1 ♀, Aug-Sept. 1911, J. Coggin Brown, 14788/H3. NEPAL: Monda, 3 ♀, 12.v.1908, Coll. Unknown, 14790/H3 to 14792/H3. SRI LANKA: Jafna, 2 ♂, June. 1910, Coll. Unknown, 14793/H3 & 14794/H3.

Distribution: Indian Subcontinent. India: Arunachal Pradesh, Assam (new record), Chhattisgarh (new record), Jharkhand (new record), Karnataka (new record), Madhya Pradesh (new record), Maharashtra, Meghalaya, Nagaland (new record), Odisha (new record), Tamil Nadu (new record), Tripura, Uttarakhand, Uttar Pradesh (new record), West Bengal; Sri Lanka: Pundaluoya, Weligma; Bangladesh: Dhaka; Myanmar: Tenasserim Province, Minhla; Nepal (new record): Monda. *Elsewhere:* China, Indonesia (Sumatra), Malaysia, Vietnam, West Indies. (Christ, 1791; Smith, 1878; Gribodo, 1884; Bingham, 1896; Cameron, 1901, 1905; Lefroy, 1904; Strand, 1915; Berland, 1926; Giner Mari, 1945; Begum & Bose, 1976; Begum *et al.*, 1995; Gupta, 1995; Jonathan *et al.*, 2000; Jonathan & Kundu, 2003; Hua, 2006; Kundu *et al.*, 2006).

2. *Chlorion regale* Smith, 1873

(Figs. 5-8)

1873. *Chlorion regale* Smith, 291, ♀ (as *regalis*, incorrect original termination). Syntypes: ♀, Afghanistan, Baluchistan, and Pakistan: Sind: no specific localities (BMNH).

Diagnosis: Female (Fig. 5). Length (H+M+T1+T2): 18-25 mm. Head broad, broader than mesosoma, somewhat square above in dorsal view, opaque; clypeus transverse, very much broader than high, convex at the middle, its anterior margin waved with 5 tooth-like structures (Fig. 6); the face on each of the base of antennae sulcate and vertically impressed line before and behind the anterior ocellus; propodeum (Fig. 7) long, posteriorly rounded truncate, transversely striate; metasoma polished and shining. Head, pronotum, mesoscutum, scutellum, tegula, femora (except hind femur sometimes more blackish), tibiae and tarsi of all legs dull brick red; tarsi somewhat fuscous; propodeum, coxae, trochanters and metasoma brilliant blackish brown with purple

reflections; wings dark brown with a purple reflection, forewing broadly fuscous at apex, apex and posterior margin of hind wing hyaline.

Male: Length (H+M+T1+T2): 20.5 mm. Similar but smaller and more slender; clypeus as in Fig. 8, convex at middle, its anterior margin with three tooth like projections.

Material examined: PAKISTAN: Karachi, 5 ♀, 02.viii.1889, Coll. W.D. Cumming, NZC Regd. Nos. 14870/H3 to 14874/H3; Baluchistan, 1 ♀ & 1 ♂, 10.v.1931, A.C. Sen, 14875/H3 & 14876/H3; Baluchistan, Quetta, 1 ♀, 07.iii.1936, Dudgeon, 14877/H3.

Distribution: Indian Subcontinent: India (Rajasthan), Pakistan (Karachi, Baluchistan, Quetta). *Elsewhere:* Afghanistan, Iran, Kazakhstan, Kuwait, Saudi Arabia, Somalia, Turkmenistan, Uzbekistan. (Bingham, 1893; Berland, 1926; Tiwary *et al.* 2004).

3. *Chlorion splendidum* Fabricius, 1804

(Figs. 9-12)

1804. *Chlorion splendidum* Fabricius, 218, sex not indicated. Holotype: ♂, India: no specific locality (ZMK).

Diagnosis: Female (Fig. 9). Length (H+M+T1+T2): 21-34 mm. Head, mesosoma and metasoma smooth and shining; metasoma brilliantly polished, head and mesosoma with a very few nearly obsolete shallow punctures; head large, much broader than mesosoma in dorsal view; clypeus vertically very narrow, transverse, slightly convex at the middle, with irregular tooth-like projections at apex (Fig. 10); base of antennae placed in a deep hollow above the clypeus, above which the front somewhat closely punctured and studded with some scattered long hairs; pronotum deeply notched at the middle; propodeum (Fig. 11) long with very little slope posteriorly, the apex roundly truncate, everywhere closely striate; legs long, tibiae and tarsi with spines, spines short and stout; metasoma petiolate, petiole short. Head, mesosoma and legs dull brick red, propodeum with a brilliant golden coppery reflection; metasoma brilliant purplish blue, petiole reddish; wings yellow, apex of fore wing and apex and posterior

margin of hind wing broadly fuscous with purple reflections.

Male: Length (H+M+T1+T2): 19 mm. Similar but smaller and slender; clypeus triangular (Fig. 12) with three strong tooth-like structures at apex.

Material examined: INDIA: Karnataka, Bangalore, 1 ♂ & 1 ♀, 1945, Coll. Cameron, NZC Regd. Nos. 14805/H3 & 14806/H3; Maharashtra, Ratnagiri district, Marleshwar, 1 ♀, 23.v.1912, F.H. Gravely, 14807/H3; Chhattisgarh, Koriya district, Guru Ghasidas National Park, 2 ♀, 12.v.2013, A. Raha & Party, 14808/H3 & 14809/H3.

Distribution: Indian Subcontinent: India: Chhattisgarh (New record), Karnataka (New record), Maharashtra (New record), Pondicherry; Myanmar (Minhla). *Elsewhere*: Egypt, Eritrea or Ethiopia, Hungary, Iran, Madagascar, Philippines, Saudi Arabia, Turkmenistan, Sudan (Smith, 1856; Costa, 1864; Gribodo, 1884; Berland, 1926).

SUMMARY

The genus *Chlorion* Latrielle, 1802 from the Indian subcontinent is reviewed, recognizing 3 species from the subcontinent. The species *Chlorion lobatum* (Fabricius, 1775) is reported here for the first time from Assam, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, Nagaland, Odisha, Tamil Nadu and Uttar Pradesh. The species *C. splendidum* Fabricius, 1804 is reported here for the first time from Chhattisgarh, Karnataka and Maharashtra. The species *C. lobatum* is herewith recorded for the first time from Nepal also.

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PLATE I
Chlorion lobatum (Fabricius)



1. Female. Body profile



2. Female. Head frontal view



3. Female. Propodeum dorsal view



4. Male. Head frontal view

Chlorion regale Smith



5. Female. Body profile



6. Female. Head frontal view

PLATE II
Chlorion regale Smith



7. Female. Propodeum dorsal view



8. Male. Head frontal view

Chlorion splendidum Fabricius



9. Female. Body profile



10. Female. Head frontal view



11. Female. Propodeum dorsal view



12. Male. Head frontal view