REICHENBACHIA

Staatliches Museum für Tierkunde Dresden

Band 32 Ausgegeben: 30. Juli 1997 Nr. 14

Notes on *Pithitis* species from the Indian subcontinent (Insecta: Hymenoptera: Apoidea)

With 3 Figures

DONALD B. BAKER

Abstract. *Ceratina comberi* COCKERELL, 1911, is synonymized with *Pithitis smaragdula* (F., 1787); a lectotype is designated for *Ceratina binghami* COCKERELL, 1908; the name *vechti* is proposed for a previously misidentified species (*P. binghami* COCKERELL of SHIOKAWA & SAKAGAMI; *P comberi* COCKERELL of HIRASHIMA). Structures of the apical metasomal terga in certain species of *Pithitis* are illustrated.

Introduction

The present notes supplement papers by VAN DER VECHT (1952), SHIOKAWA & SAKAGAMI (1969) and HIRASHIMA (1969). *Ceratina comberi* COCKERELL, 1911, is synonymized with *Pithitis smaragdula* (F., 1787), syn. nov. A lectotype is designated for *Ceratina binghami* COCKERELL. The *Pithitis binghami* COCKERELL of SHIOKAWA & SAKAGAMI, and the *P. comberi* COCKERELL of HIRASHIMA, both misidentifications, are referred to *P. vechti,* spec. nov. New records, including plant records, are given for some of the lesser-known species. Details and figures of the lattice-like structures present on the apical metasomal terga of the males of certain regional species are given.

Taxonomy

The taxa recognized are dealt with in the chronological sequence of their descriptions. Localities given in citations of original descriptions are restricted to type localities. Abbreviations of type depositories immediately follow citations, thus [ZMK].

Pithitis smaragdula (F., 1787)

Apis smaragdula F., 1787: 305; [♂]; Habitat Tranquebariae Dom. Hybner. [ZMK] Zimsen (1964: 414, no. 1053) recorded five specimens in the Kiel Fabrician collection, one labelled as lectotype by MOURE.

Apis comberi COCKERELL, 1911: 185; ♀; Karachi, N.W. India. [NHML] **syn. nov.**

[The further synonymy of this species is given by VAN DER VECHT, 1952: 15.]

VAN DER VECHT (1952: 23) suggested – he did not see the type – that *comberi* might be *smaragdula.* COCKERELL described *comberi* from a female or females from Karachi. A female in NHML, labelled

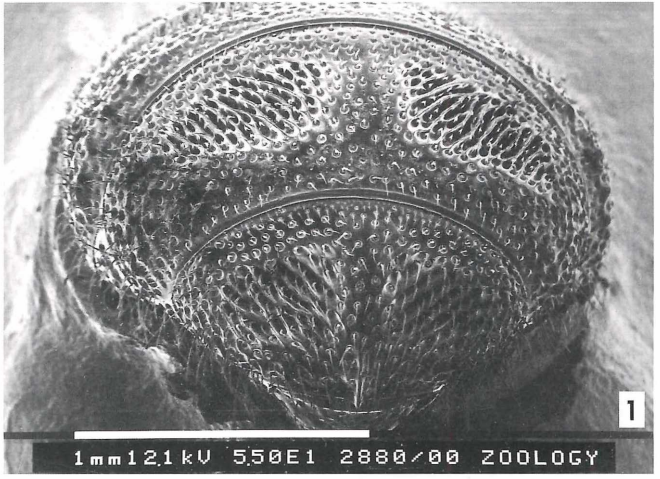
Address of the author:
Dr. D.B. Baker, Hope Entomological Collections,
University Museum, Oxford OX1 3PW (U.K.)

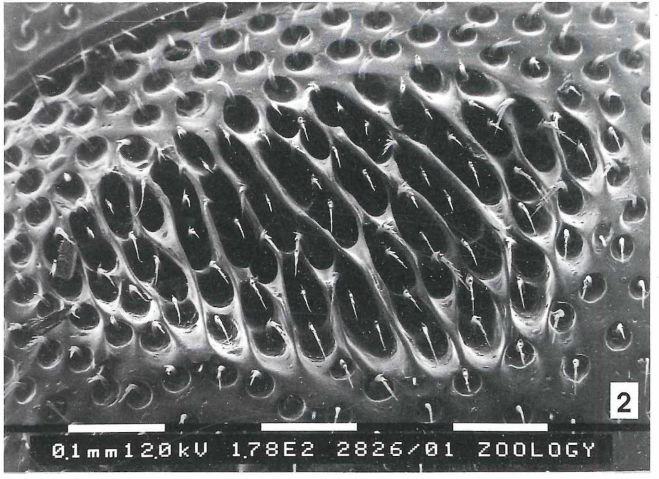
'Krchi' [blue typescript, = Karachi (E. COMBER)] and '*Ceratina comberi* Ckll TYPE', B.M. Type Hym. 17 b 208, is a quite normal female of *smaragdula,* as are two associated females also collected by COMBER, one also 'Krchi', the other 'Hydbd' [Hyderabad]. VAN DER VECHT (1952: 18) referred to *smaragdula,* expressedly with some doubt, but probably correctly, two other females from COMBER's Karachi series in USNM, one determined by COCKERELL as *comberi,* the other as *sexmaculata.*
The specimen labelled as type by COCKERELL is accepted as the holotype of *comberi,* since in this specimen alone could the second cubital cell be described as 'pointed': strictly, it is not pointed, but the intercept on the radius is much narrower than in either of the other two specimens. The same anomaly occurs in one of a series of *smaragdula* obtained more recently at Karachi (Burns Gardens, 5 iii 1983) by Dr. P.H.B. BAKER.
Pithitis smaragdula has been well described and figured by recent authors (VAN DER VECHT, 1952; SHIOKAWA & SAKAGAMI, 1969; HIRASHIMA, 1969), and no further description is given here, except to note that in the females the punctation of the mesoscutum is not only relatively coarse but the punctures immediately outside the parapsidal lines are conspicuously larger than those immediately within; further, laterotergite 1 commonly has very few punctures adjacent to the extraspiracular carina. For the distinction of female *smaragdula* from *vechti,* see under that species.

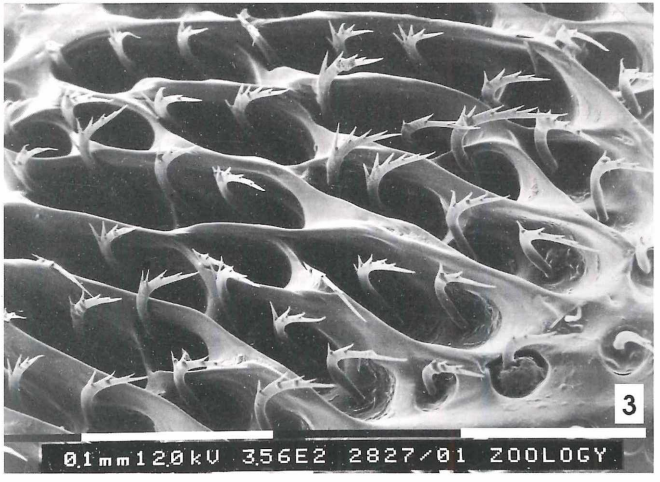
Pithitis binghami (COCKERELL, 1908)

? *Apis aenea* F., 1798: 277: sex?; Habitat in India orientali Dom. Hybner. [ZMK]
[*Ceratina viridissima* DALLA TORRE: BINGHAM, 1896: 201; misdetermination.]
Ceratina binghami COCKERELL, 1908: 340; [♂, ?♀]; Calcutta and Siliguri. [USNM]
Pithitis sympatrica SHIOKAWA & SAKAGAMI, 1969: 141, 144 (in key), 149, fig. 1, 2; ♂♀; Poona, India. [HUS] Synonymized with *binghami* by HIRASHIMA, 1969: 658.

Apis aenea: ZIMSEN (1964: 414, no. 1049, as *'aeneata'*) recorded two specimens each in the Kiel and Copenhagen Fabrician collections, one of the Kiel specimens said to have been labelled as lectotype by MOURE. A Kiel specimen sent as the type by Dr. BORGE PETERSEN in 1978 was *binghami.* The other Kiel specimen had no labels; the Copenhagen specimens were labelled, one, 'orig. label *M. aenea,* Tranquebar, Daldorff', the other, '*Ceratina smaragdula* Fabr., Moure 1958' [PETERSEN, in litt., 19 Oct 1992]. Unfortunately, two of these specimens, sent by Dr. PETERSEN for examination in January 1993 were lost in transit, and the question of the identity of FABRICIUS' taxon is presently unresolved. However, since *Apis aenea* F., 1798, is in any event a junior primary homonym of *Apis aenea* L., 1761, further enquiry would appear nugatory. The possible identity of the Fabrician *aenea* was discussed by VAN DER VECHT (1952: 22), who arrived at no conclusion. The taxon is provisionally listed under *binghami* following the present author's 1978 determination. Moreover, *P. binghami* is apparently the most common Indian species, and ipso facto the more likely to have come to FABRICIUS' notice.
BINGHAM's *viridissima,* for which he gave the distribution: 'Apparently throughout India, Burma and Ceylon; Assam; China; Malacca' was certainly composite. Of two females labelled by BINGHAM as *viridis* (and found still standing under that name in NHML, mixed with African material), one (Bangalore, S. India, 7.94, Bingham Coll.) is *binghami* but the other (Tenasserim, Ye Valley, 3.93, Bingham Coll.) is not, although of uncertain identity [sternum 3 with wax-gland; clypeal marking intermediate in form between those illustrated by SHIOKAWA & SAKAGAMI for *smaragdula* and the species they called *binghami* (i.e., *vechti*); length 8 mm].
COCKERELL proposed the name *binghami* (in the form '*Ceratina binghami,* sp. n.') for the Indian species that BINGHAM had treated under the name *viridissima* DALLA TORRE, 1896. The latter name had been proposed by DALLA TORRE (1896: 201) as a replacement name for *Ceratina viridis* GUÉRIN, 1844, supposedly preoccupied by *Megilla viridis* ILLIGER, 1806, transferred to *Ceratina* by LATREILLE (1809: 160). However, *Megilla viridis* ILLIGER (1806: 139, 'Brasilien') was a nomen nudum, and LATREILLE gave no description. The name *viridis* is therefore valid for the African species described by GUÉRIN (1844: 449) from Senegal.
COCKERELL gave no description, except by implication ('Compared with the Indian insect these *viridis* [from the Ekuiva Valley, inland from Benguella] are more robust and much less brilliantly coloured,







Figs 1–3: *Pithitis smaragdula* (F., 1787), ♂, MALAYA: Johore, G. Lambak, 300 m, 15 xi 1970 (C.G. Roche, 8950). Paired clathra of metasomal terga 4–6. Fig. 1, metasoma in anal aspect. Fig. 2, tergum 5, clathrum of left side: the transition from normal punctures to deep sulci is clearly shown. Fig. 3, central area of figure 2, further enlarged to show details of lattice structure and modified setae. SEM photographs by Mrs B. Luke, Department of Zoology, Oxford.

and somewhat more coarsely punctured'), presumably assuming the adequacy of BINGHAM's description. COCKERELL did not designate a type, but merely noted (p. 341); 'My specimens of *C. binghami* [number and sex not indicated] are from Mr. Sladen, and were collected at Calcutta and Siliguri in 1897' VAN DER VECHT (1952: 21) referred to a male 'cotype' [syntype] in USNM [Calcutta, I 1897 (F.W.L. Sladen)], and it is in VAN DER VECHT's sense that HIRASHIMA (1969: 657) applied the name. Since it is possible that COCKERELL's series was composite – COCKERELL's determinations in this genus are not altogether reliable[1]) (cf. under *vechti*) – the male syntype seen by VAN DER VECHT is now designated as lectotype of *Ceratina binghami* COCKERELL, 1908. Descriptions and figures are given by VAN DER VECHT (1952: 21), SHIOKAWA & SAKAGAMI (1969: 149, as *sympatrica* SHIOKAWA & SAKAGAMI) and HIRASHIMA (1969: 657).
As with *smaragdula,* the species has been well described and figured by recent authors.

Pithitis waini SHIOKAWA & SAKAGAMI, 1969

Pithitis waini SHIOKAWA & SAKAGAMI, 1969: 144 (in key), 146, fig. 1, 3; ♀♂; [India:] Sinhagad, W. Ghats. [HUS]

Additional records:
INDIA: Maharashtra, Lonavla [Lonaula of Times Atlas], 650 m, 15 i 1959, at *Pogostemon* [Labiatae], ♂; 16 v 1959, at *Randia* [Rubiaceae], ♂♂ (all F.L. Wain). Like the type series, these specimens were collected by the late Father Wain in the Western Ghats. The plant records are new. [OUM, DBB.] Tamil Nadu, Nilgiri Hills, Devala, 975 m, ix 1960, 1 ♂ 1 ♀; x 1960, 1 ♂ 4 ♀♀. Tamil Nadu, Nilgiri Hills, Cherangode, 1050 m, xi 1950, 2 ♀♀. Kerala, Trivandrum District, Poonmudi Range, 900 m, v 1992, 1 ♂. Karnataka, Coorg District, Mercara, 1200 m, v 1973, 1 ♀; x 1973, 1 ♀ (all P.S. or T.R.S. Nathan). 'Sidapur' [Gujarat, Sidhpur ?], 1988, from twigs of coffee [*Coffea,* Rubiaceae], 1 ♀ [DBB (8911)].

Pithitis indica HIRASHIMA, 1969

Pithitis indica HIRASHIMA, 1969: 660, fig. 13, 18; ♀♂; Cinchona, ... Anaimalai Hills, S. India. [SEMK]

Additional records:
INDIA: Anaimalai Hills, Cinchona, 1050 m, v 1957 (P.S. Nathan), 1 ♂ 3 ♀♀ [DBB].

Pithitis rufipes HIRASHIMA, 1969

Pithitis rufipes HIRASHIMA, 1969: 664; ♀; India. [MNHNP]

This name, taken from the label of a single specimen in SICHEL's collection, was perhaps published inadvertently, but a description was given and the name, which must be attributed to HIRASHIMA, is nevertheless valid. *Pithitis rufipes* has not been recognized among very numerous Indian *Pithitis* examined, and it is possible that the locality is wrong.

Pithitis vechti spec. nov.

[*Pithitis binghami* COCKERELL: SHIOKAWA & SAKAGAMI, 1969: 148; misidentification.]
[*Pithitis comberi* COCKERELL: HIRASHIMA, 1969: 659; misidentification.]

Material examined:
Holotype: ♂ labelled 'W India / W. Ghats / Lonavla / 7 iv 1967' [OUM].

[1]) Of five specimens in NHML determined by COCKERELL as *binghami,* only two, a ♂ from Nasik collected by Comber and a ♀ from Dehra Dun [Nov. 1907 (Lt. Col. F.W. Thomson, I.M.S.)], were correctly placed.

Paratypes: INDIA, Maharashtra: Lonaula, 16 vi 1958, 1 ♂; 16 v 1959, at *Eriolaena* [Sterculiaceae], 1 ♀; 30 i 1966, 1 ♂; 27 ii 1966, 1 ♂; 19 xi 1966, 3 ♂♂, det. Daly as *comberi* Ckll.; 20 xi 1966, 3 ♂♂ 1 ♀; 4 iii 1967, 1 ♂; 14 iii 1967, 1 ♂; 7 iv 1967, 2 ♂♂ 3 ♀♀; 7 i 1970, at *Leucas* [Labiatae], 1 ♂. Sinhagad, v 1952, 1 ♀; 9 v 1967, 1 ♀; 10 v 1967, 1 ♂; 14 ii 1970, at *Vitex* [Verbenaceae], 3 ♂♂ 2 ♀♀; 13 v 1975, 1 ♀; 19 iii 1976, 1 ♀; 29 iv 1977, 1 ♀; 30 iv 1977, 2 ♂♂ (all F.L. Wain). [OUM and DBB]
Other material, not paratypes: S. INDIA: Kerala, Trivandrum District, Poonmudi Range, 900 m, v 1992 (T.R.S. Nathan), 1 ♂ [DBB]. Tamil Nadu, Nilgiri Hills, Cherangode, 1 050 m, xii 1950 (P.S. Nathan), 1 ♀ [DBB].

This species is adequately described and figured by SHIOKAWA & SAKAGAMI (1969, as *binghami*) and by HIRASHIMA (1969, as *comberi*). Apart from the characters noted in HIRASHIMA's key, the female of *vechti,* whose recognition has exercised authors (cf. VAN DER VECHT, 1952: 21; SHIOKAWA & SAKAGAMI, 1969: 148), may further be distinguished from that of *smaragdula* by the angular rather than arcuate junction of the carinae delimiting the supraclypeal area superiorly; by the punctation of the mesial area of the mesoscutum, which anteriorly is fine and dense; and by the punctation of the lateral areas, the punctures between the parapsidal lines and the lateral margins tending to form four irregular longitudinal series and those between the former and the conspicuous impunctate lines that prolong the notaulices six irregular series (as against fewer, three and four, in the more coarsely punctate species). None of these characters is, of course, absolute, and, in the absence of associated males, the identity of some females may remain uncertain.

Structures of the male terga

Terga 4–5(–6) in males of *P. smaragdula* and *P waini* exhibit, to the naked eye, paired dark areas of varying extent. These have been referred to as 'large lunate spots' (SMITH, 1854: 226), 'square velvety black spots' (BINGHAM, 1897: 502), 'velvety black spots' (VAN DER VECHT, 1952: 12), or 'black depressed areas' (SHIOKAWA & SAKAGAMI, 1969: 144). None of these descriptions adequately indicates the complexity of the structures concerned, but HIRASHIMA's 'large excavated, longitudinally striated, velvety black area' and somewhat diagrammatic figure (1969: 661) do better characterize them. These *clathra*[2]), apparently unique to the two species named, which do not differ remarkably in other characters from other *Pithitis,* arise in the position occupied on terga 2 and 3 (in both sexes) by small, dark, transverse, impunctate areas. They consist of a lattice formed by the deepening, enlargement and coalescence of normal, setigerous punctures and the setae arising from them are also modified, becoming enlarged and unilaterally ramose (fig. 1–3, also BAKER, 1993: 29). The function of these structures, possibly involved in the secretion, storage and dispersal of pheromones rather than functioning as sensory organs, is uncertain, and parallel modifications in other bees have not been recognized, although possibly analogous structures appear more or less well developed on anterior terga of some megachilid bees, e.g., *Megachile* and *Coelioxys.* Fresh or suitably preserved material would be required to investigate possible underlying structures.

Abbreviations

DBB	D.B. Baker, Ewell, private collection.
HUS	Zoological Institute, Hokkaido University, Sapporo.
MNHNP	Musée National d'Histoire Naturelle, Paris.
NHML	Natural History Museum, London [formerly the British Museum (Natural History)].
OUM	Hope Entomological Collections, University Museum, Oxford.
SEMK	Snow Entomological Museum, University of Kansas, Lawrence.
USNM	United States National Museum, Washington.
ZMK	Zoologisk Museum, Københavns Universitet.

[2]) L. clatro (clathro), *to provide with a grating or bars, cf.* Gr. κλειθρου and esp. κλειθρώδης, *full of chinks.*

References

BAKER, D.B. (1993): The type material of the nominal species of exotic bees (Hymenoptera, Apoidea) described by Frederick Smith. Unpublished D. Phil. thesis, Oxford University.

BINGHAM, C.T. (1897): Hymenoptera. – Vol. I. Wasps and bees. In: BLANFORD, W.T. (ed.), The fauna of British India, including Ceylon and Burma. Pp. [i]-xxix, [1]- 579, 4 pl., 189 fig. London, & c; Taylor and Francis.

COCKERELL, T.D.A. (1908): Descriptions and records of bees. – XIX. – Annals and Magazine of Natural History, (8) 1: 337–344.

COCKERELL, T.D.A. (1911): Descriptions and records of bees. – XXXVII. – Annals and Magazine of Natural History, (8) **8:** 179–192.

COWAN, C.F. (1971): On Guérin's Iconographie: Particularly the insects. – Journal of the Society for the Bibliography of Natural History, **6:** 18–29.

DALLA TORRE, C.G. DE (1896): Catalogus hymenopterorum hucusque descriptorum systematicus et synonymicus. Pp. [I]-VIII, 1–643. Lipsiae; Guilelm Engelmann.

FABRICIUS, J.C. (1787): Mantissa Insectorum sistens eorum species nuper detectas adiectis characteribus genericis, differentiis specificis, emendationibus, observationibus, 1. Pp. [i]-xx, [1]-348. Hafniae; Christ. Gottl. Proft.

FABRICIUS, J.C. (1798): Supplementum entomologiae systematicae. Pp. [i-iv], [1]-572. Hafniae; Proft et Storch.

GUÉRIN-MÉNEVILLE, F.E. (1829–1844): Iconographie du règne animal de G. Cuvier, ou représentation d'après nature de l'une des espèces les plus remarquables et souvent non figurées de chaque genre d'animaux. Avec un text descriptif mis au courant de la science. Ouvrage pouvant servir d'atlas a tous les traités de zoologie. [Tome] Insectes. Pp. [1]-560, [561]-576 [Table alphabétique, by M.E. Desmarest]. Paris, Londres; J.B. Baillière. [1829-1837], Tome II, Planches des animaux invertébrés. Frontisp. [portrait of Latreille], pl. 1–104. Paris; Fain et Thunot. For the dates see COWAN, 1971.

HIRASHIMA, Y. (1969): Synopsis of the genus *Pithitis* Klug of the World (Hymenoptera: Anthophoridae). – Pacific Insects, **11** (3-4): 649–669, 21 fig.

ILLIGER, K. (1806): William Kirby's Familien der bienenartigen Insekten mit Zusätzen, Nachweisungen und Bemerkungen. – Magazin für Insectenkunde, **5:** 28–175.

LATREILLE, P.A. (1809): Genera Crustaceorum et Insectorum secundum Ordinem naturalem in Familias disposita, Iconis Exemplisque plurimis explicata, 4: [i-iii], [1]-399. Parisiis et Argentorati; Amand Kœnig.

SHIOKAWA, M. & SAKAGAMI, S.F. (1969): Additional notes on the genus *Pithitis* or green metallic small carpenter bees in the Oriental Region, with descriptions of two species from India. – Nature and Life in Southeast Asia, **6:** 139–151, 1 pl., 3 fig.

SMITH, F. (1854): Catalogue of hymenopterous Insects in the collection of the British Museum, [1], Pt II. Apidæ. Pp. [i-iii], [199]-465, pl. VII-XII. London; Trustees of the British Museum.

VAN DER VECHT, J. (1952): A preliminary revision of the oriental species of the genus *Ceratina* (Hymenoptera, Apidae). – Zoologische Verhandelingen, **16:** 1–85, 75 fig.

ZIMSEN, E. (1964): The type material of I.C. Fabricius. Pp. [1]-656. Copenhagen; Munksgaard.

(Received on 19. X. 1995)