

A review of the Asian species of the genus *Euaspis* Gerstäcker (Hymenoptera: Apoidea: Megachilidae)

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Key words: *Euaspis edentata*; *Euaspis lorenzae*; *Euaspis wegneri*; Malesia; new synonymy; keys.

The Asian species of *Euaspis* are reviewed. *Euaspis carbonaria* of authors is shown to be composite: a lectotype is designated and the species with which *carbonaria* has long been confused is described as *Euaspis edentata* spec. nov. *Euaspis lorenzae* spec. nov. is described from the Philippines and *E. wegneri* spec. nov. from Bacan (Moluccas). Two species described by Pasteels from 'Arabia' are shown to be of Bornean origin. *Euaspis bakeri* (Viereck, 1924) is synonymized with *E. strandi* Meyer, 1922, for which a lectotype is designated (the type locality Sikkim given by Meyer for this taxon is apparently false), and *E. impressa* (Viereck, 1924) with *E. polynesia* Vachal, 1903.

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Introduction

The species of *Euaspis* were revised by Meyer (1922) and by Pasteels (1980). A further review might be thought supererogatory, but Pasteels' revision is compromised by so many errors of commission and omission as to render the present review essential. Pasteels' revision omitted any reference to a paper by Viereck (1924) describing and illustrating two new taxa from the Philippines; described as from 'Arabie' two new taxa coming in fact from Borneo; gave incorrect data for the holotypes of the latter two taxa; and was replete with other errors. Since the genus is

a small one, it would seem simplest to present the necessary corrections and additions in the form of an annotated catalogue and add a key to the taxa involved.

All primary types in the collections of the the Natural History Museum, London (formerly British Museum (Natural History)), the Museum für Naturkunde der Humboldt-Universität, Berlin, the National Museum of Natural History (formerly United States National Museum), Washington D.C., the Universitetets Zoologiske Museum, København, and the University Museum, Oxford, have been examined. Other material studied has been chiefly that in the British Museum, for the Indian subcontinent, and in the very extensive collections of the Nationaal Natuurhistorisch Museum, Leiden, for Malesia.

Euaspsis Gerstäcker, 1858

- Euaspsis* Gerstäcker, 1858: 461. Type species [*Euaspsis rufoventris* Gerstäcker, 1858, nec (Latreille, 1809), =] *Thynnus abdominalis* Fabricius, 1793 (monobasic and by original designation).
Dilobopeltis Fairmaire, in Thomson, 1858: 266. Type species [*Dilobopeltis fuscipennis* Fairmaire, 1858, =] *Thynnus abdominalis* Fabricius, 1793 (monobasic). Isotypic with *Euaspsis* through synonymy.
Parevaspsis Ritsema, 1874: lxxi; three species. Type species *Parevaspsis basalis* Ritsema, 1874 (by designation of Sandhouse, 1943: 585).

Euaspsis (sensu stricto) is Ethiopian. *Parevaspsis*, variously treated as a genus or as a subgenus of *Euaspsis*, is Oriental and comprises a majority of the species. These differ little from the Ethiopian forms, except in their generally smaller size, and, in particular, the Bornean *E. diversicarinata* and the Philippine *E. lorenzae* have male genitalia essentially similar to those of the Ethiopian *E. abdominalis* (figs 14, 17, 20).

The Ethiopian species will not further be dealt with here, except to note:

a) that *E. erythros* (Meunier) is to be dated 1890 (30 June), not 1889 as given by Pasteels.

b) that Popov's suggestion (1933: 376) that *Stelis dimidiata* Walker, 1871, was probably to be referred to *Euaspsis* is unacceptable. Walker's description of *S. dimidiata*, collected by Lord at Hor Tamanib [Sudan: Red Sea coast between Suakin and Massawa], does not suggest *Euaspsis* and the size ($3\frac{1}{2}$ lines = 7.4 mm) militates against this identification. Since Walker saw both sexes, one might have expected that Smith would have retained a duplicate, as he did with other Lordian species, but there is no card for *S. dimidiata* in the BMNH type index and the name does not appear as a drawer-label under *Stelis* (which genus has however been rearranged comparatively recently).

The Asian species of *Euaspsis*

Euaspsis carbonaria (Smith, 1854) (figs 3-5)

Stelis carbonaria Smith, 1854: 275; ♀, ♂ p.p.; East Indies; N. Bengal; Ceylon. Smith's type series was composite, comprising (all in BMNH):

- a) ♀, 'E. Indies /⁴⁷₁₄' [white disc]. No further data available [probably from India]: this specimen came from a small lot, including three Hymenoptera, presented by Capt. Parry. It agrees with Smith's description of the female, and was labelled by Pasteels as lectotype, but the designation was not published and has no validity. This female is apparently an anomalous specimen of *E.*

carbonaria in which the median tubercle of sternum 6 is weak, obtusely angular in profile rather than dentiform; apicad, the sternum is concave in profile as in normal *E. carbonaria* (figs 3 and 4). Because of this anomaly and because of the lack of a more precise locality, this syntype is not selected as lectotype.

b) ♂, 'N. Bengal / 42₂₅' [white disc]. The Museum's accessions register indicates that this specimen was collected by Lt. Campbell in the 'N. part of Bombay Presidency', i.e., in what was then known as Ajmere, comprising parts of present-day Pakistan and Rajasthan. This male (dissected and remounted) is *E. carbonaria*. It has now been labelled and is here designated as **lectotype** of *Stelis carbonaria* Smith, 1854.

c) ♂, 'Ceylon / 53₂₃' [white disc]. Collected by Thwaites, purchased from Cuming. This male (dissected and remounted) is *E. edentata*, q.v. A fourth specimen, associated with the above in the collection, was a female labelled '40/4-2/494' [white disc]. This was one of three specimens of *Stelis* (nos 492-494) included in the large purchases made by the Museum at the sale of J.G. Children's collection¹. It is in fact, although determined by Pasteels as '*Euaspis Parevaspis carbonaria* Sm.', a species of *Stelis*, and it does not, of course, agree with Smith's description². It is, however, the specimen to which is now attached Smith's label '*carbonaria* Type Sm' (probably transposed from one of the above syntypes, possibly when the original pins were cut down and the specimens staged), and it is the specimen registered as B.M. Type Hym. 17 a 2569: this is a **false type**.

Euaspis (Parevaspis) carbonaria Smith, Meyer, 1922: 237; ♂ p.p.

?*Euaspis (Parevaspis) similima* Meyer, 1922: 236 (in key, erroneously as ♂), 238; ♀; Saleyer J. [Salayar Island], S. Celebes. Holotype ♀ MNHUB (examined). The holotype is apparently a female of *E. carbonaria*, but comes, unless there has been an error in labelling, from far beyond the ascertained range of that species.

Euaspis (Parevaspis) carbonaria Smith, Pasteels, 1980: 82, p.p. Pasteels did not distinguish between *E. carbonaria* and *E. edentata*; he also gave a false reference to Smith's description, vol. 2 for vol. 1 (part 2).

Additional material examined.— **INDIA**: Deesa, viii.1897, 1 ♂, 2 ♀♀, vii.1898, 4 ♀♀, x.1898, 6 ♂♂, 1 ♀, ii.1899, 3 ♂♂, iii.1899, 3 ♂♂, x.1899, 4 ♂♂, viii.1901, 1 ♀; Jubbulpore [Jabalpur], vi.1907, 1 ♂, 8.xi.1907, 1 ♂ (all Col. C.G. Nurse); Ahmedabad, Bombay, iii.1889 (Miss A. Brook), 2 ♀♀ (ex coll. Col. C.T. Bingham, 96-30); 'E. Indies 47₁₄' [probably India], 1 ♀ (syntype of *Stelis carbonaria* Sm., = paralectotype) [all BMNH]. Beng[ale], *violacea* (Lepeletier MS ?), in so-called Latreille Collection, 1 ♀; Poona, 8.xii.1955, 1 ♀, 9.ix.1956, 1 ♂ (dissected), ix.1958, 1 ♀, 29.viii.1963, 1 ♂ (diss.), 8.ix.1966, 1 ♂ (diss.), 11.xi.1966, 1 ♂ (diss.), 15.xi.1974, 1 ♀, 13.iii.[year ?], 1 ♀; Poona, Hadapsar, 550 m., 10.x.1971, 1 ♀; Satara, 30 viii 1964, 1 ♂ (diss.) (all Father F.L. Wain); Deesa, ii.1899, 1 ♂, iii.1899, 2 ♂♂ (1 diss.), 1897-1902, 1 ♂ (all Col. C.G. Nurse); Barrackpore (G.A.J. Rothney), 4 ♀♀ [all OUM]. Madras State, Coimbatore, 1400 ft, xi.1950, 1 ♀, ix.1971, 1 ♀; Madras State, Pt Calimere, x.1971, 1 ♀ (all P.S. or T.R.S. Nathan); Hisar, 17.v.1986, 1 ♀, 18.v.1986, 1 ♂ (A. Rahman) [all DBB]. Madras State, Coimbatore, 1400 ft, v.1960, 1 ♀, xi.1960, 1 ♀, iv.1962, 2 ♀♀, vi.1962, 1 ♀, vii.1962, 1 ♀, xii.1962, 1 ♂ (diss.) (all P.S. Nathan) [all RMNH].

Euaspis edentata spec. nov.
(figs 1-2, 6)

Apis carbonaria L.: Fabricius, 1798: 275; [♀]; 'Habitat Tranquebariae Dom. Lund': misidentification.

Stelis carbonaria Smith, 1854: 275; ♂ p.p., not ♀; Ceylon [vide supra, *E. carbonaria* (c)].

Euaspis (Parevaspis) carbonaria Smith, Meyer, 1922: 237; ♂ p.p. ♀; Pasteels, 1980: 82; p.p.

Material.— Holotype, ♂, [India] 'W. Ghats, Sinhgad, 6.v.1958' [Father F.L. Wain] [OUM]. Paratypes, 7 ♀♀ + 12 ♂♂: all INDIA, Western Ghats (Father F.L. Wain): Sinhgad, v.1952, 1 ♂ (diss.), 6.v.1959, 1 ♂, 12.v.1959, at *Vitex*, 1 ♂, 3.iv.1967, 1 ♂ (diss.), 9.v.1967, 2 ♂♂ (diss.), 1 ♀, 14.ii.1970, at *Vitex*, 1 ♂ (diss.); Lonavla, 16.vi.1958, 1 ♂ (diss.), 11.v.1959, at *Vitex*, 1 ♂ (diss.), 7.iv.1967, 2 ♀♀, 9.i.1970, at *Vitex*, 1 ♀, 5.iii.1970, 1 ♂ (diss.); Poona, 8.ix.1966, 1 ♀, 18.ix.1966, 1 ♂ (diss.), 17.xi.1974, 1 ♀; Poona Dt, Karla, 21.iv.1960, 1 ♀; Satara, 30.viii.1964, 1 ♂ (diss.) [OUM and DBB]. [Most dissections are slide mounts by Father Wain, who suspected, but was unable to confirm, the presence of two species in his material.]

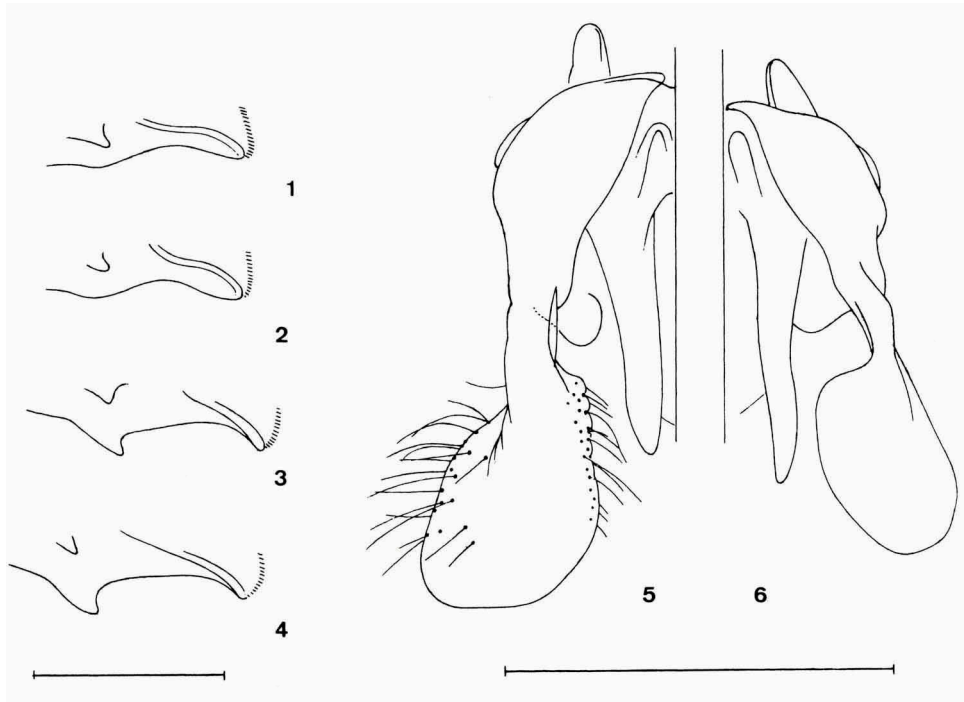
Other material, not paratypes: **INDIA**: no exact locality, no. 31 (Smith Colln, 1899-303), 1 ♀; Calcutta, 2 ♂♂, 3 ♀♀ (Smith Colln, 1899-303); Calcutta (G.A.J. Rothney), 1 ♀ (ex Ind. Mus., 1879-64); Bandra (Dr

Jayakar, 1 ♀ (B.M. 1905-152); Bombay ♀⁶⁹, 1 ♀; Salsette, Bombay Presidency (E. Comber), 1 ♀ (B.M. 1910-255); Travan[core], 1 ♀ (Smith Colln, 1899-303); Matheran, iii.1899 (Col. C.G. Nurse), 1 ♀; W. India, Kolhapur, 4.xii.1992 (K.M. Guichard), 3 ♂ ♂ [all BMNH]. Kumaon, Ranikhet, 16.v.1964, 1 ♂ (diss.) (Father F.L. Wain); Barrackpore, 16 ♀ ♀; Allahabad, 2 ♀ ♀ (all G.A.J. Rothney) [all OUM]. Coimbatore, 5.iv.1950, 1 ♀, xi.1960, 1 ♂; S. Malabar Distr., Walayar Forests, x.1957, 1 ♂ (all P.S. Nathan) [all DBB]. Madras State, Coimbatore, 1400 ft, viii.1959, 1 ♀, viii.1960, 2 ♂ ♂ (diss.), xi.1960, 1 ♀; C.E. India [Orissa], 'Teypone' [for Jeypore], 1775 ft, ix.1958, 1 ♂ (diss.), 1 ♀, *Parevaspis carbonaria* Sm. det. Lieftinck; S. Malabar Distr., Walayar Forests, 700 ft, x.1959, 2 ♂ ♂ (diss.) (all P.S. Nathan); (India, no further data, 1 ♂ (diss.), 1 ♀ (both ex F. Smith) [all RMNH]. CEYLON [Sri Lanka]: no exact locality (Dr Thwaites), 1 ♀ (1867-25); no exact locality, 1 ♀ (Smith Colln, 1899-303); no exact locality, 1 ♀ (Col. C.T. Bingham, 1896-30), 1 ♀; Maha-Oya dist., Pollebedda, 15.viii.1963 (Univ. London Ceylon Expedn: R. Winney), 1 ♀; no exact locality, 1 ♂ (syntype of *Stelis carbonaria* Sm.) (B.M. 1853-23) [all BMNH]. Kandy, Lady Horton's, 7.ix.1953, 1 ♀; C.P. Kandy, L. Blake's Drive, 11.vi.1953, 1 ♂ (diss.); N.C.P. Mineriya Tank, 27.ix.1953, 1 ♂ (diss.) (all F. Keiser) [all RMNH].

The name *A. carbonaria* Linnaeus, 1767, was based on a scoliid (= *Scolia neglecta* Cirillo, 1787: cf. Day, 1979: 58) but came early to be misapplied to a species of *Andrena*. Fabricius, noting that his species was 'Distincta omnino ab *Andrena carbonaria*', himself misapplied Linnaeus' name to a stelid. Zimsen (1964: 420) seems not to have recognized that the *A. carbonaria* of the Suppl. Ent. syst. was not a newly described species. I examined in 1980 the three specimens recorded by Zimsen as representing '*Apis carbonaria* F.', two from the Copenhagen collection (one labelled '*A. carbonaria* e Tranquebar', the other without original label) and one from the Kiel collection (labelled '*carbo / naria*' and, in another hand, '*Stelis*'). The three specimens, mounted on similar pins and probably from the same source, were apparently conspecific. Misled by Zimsen, I labelled as lectotype the '*A. carbonaria* e Tranquebar' specimen, and as paralectotypes the other two. The 'lectotype' was in clean and nearly fresh condition, lacking only segments 3-5 of tarsus RI. More recently, after it had become clear that the *Euaspis* (or *Parevaspis*) *carbonaria* of authors was composite, and while a name attributed to Fabricius could not be used, it remained of interest to ascertain to which of the two newly recognized species the Fabrician material should be referred. Dr Petersen kindly forwarded to Oxford the two Copenhagen specimens for re-examination, but these (with type material of two genuine Fabrician taxa) were most unfortunately lost in transit. Dr Petersen has since (November 1993) forwarded the remaining (Kiel) specimen, with data as indicated above. This specimen, a ♀ in poor condition, belongs unmistakably to the present species.

Description.— No formal description of this species is necessary: *E. carbonaria* and *E. edentata* are the only regional species having the metasoma entirely black and published descriptions of '*carbonaria*' (Smith, 1854; Bingham, 1897: 499, as *Parevaspis*; Meyer, 1922; Pasteels, 1980) apply generally to both. The males are readily distinguished by their very different gonocoxites. The females are less distinct and may not always be separable, but the characters of sternum 6 are usually diagnostic. Both species show some variation in surface sculpture, vestiture and size, and each may have more than one host, which, as in other cleptoparasitic bees, would be conducive to the evolution of host-specific forms. At present, available data are totally inadequate for more detailed analysis.

Biology.— Both sexes were collected at *Vitex* (Verbenaceae) by the late Father Wain. The host is not certainly known, but both sexes have repeatedly been taken in association with *Lithurgus* (Megachilidae, Lithurginae).



Figs 1-6, characters in *Euaspid* species. Figs 1-4, sternum 6 of ♀ (left profile); figs 5-6, ♂ genitalia (dorsal aspect), in (figs 1-2, 6) *E. edentata* spec. nov. [1, INDIA: Poona, 8.ix.1966 (F.L. Wain); 2, INDIA: Barrackpore (G.A.J. Rothney); 6, INDIA: Poona, 18.ix.1966 (F.L. Wain, slide 10)] and (figs 3-5) *E. carbonaria* (Smith) [3, INDIA: Poona, 15.xi.1974 (F.L. Wain); 4, INDIA: Coimbatore, xi.1950 (P.S. Nathan); 5, INDIA: Poona, 8.ix.1966 (F.L. Wain, slide 11)]. Scale lines represent 1 mm.

Euaspid trilobata Pasteels, 1980
(figs 7-9, 21)

Euaspid trilobata Pasteels, 1980: 77 (in key), 86, fig. 1e; ♀; West Flores. Holotype in RMNH.

Material.— **SUMBAWA**: Sumbawa-Besar, 19.v.1949 (Dr Bühler, Dr Sutter), 2 ♀♀; Dobu, 500 m, 24.viii.1950 (J. van der Vecht), 3 ♂♂ (1 diss.); N of Pancasila, nr Gn. Tambora, c. 500 m, 27.ix.1993 (Y. v. Nierop), 1 ♀ [all RMNH]. **SUMBA**: 'W. Sumba, 16 ix 1949, Dr Sutter' and 'Pogobina, Dr Bühler' [an original label similar to the Sumbawa-Besar labels recorded above appears to have been cut into two], 1 ♂ (diss.) [RMNH]. **FLORES**: Wolo-odja, 15.viii.1950 (J. van der Vecht), 1 ♂ [RMNH].

The male of this species, which appears to be confined to the Lesser Sunda Islands, has not previously been described. It is very similar superficially to that of *polynesia* but as in the female the apices of the axillae are free, angular. Tergum 7 is bluntly tridentate (fig. 7). The apical margin of sternum 6 has an apparent biemargination forming a small median tooth, but the margin is in fact entire, the integument within the emarginations being finely membranous and transparent (fig. 8). Genitalia: fig. 9.

Euaspsis polynesia Vachal, 1903
(figs 10-12, 22)

[*Stelis javanica* Lepeletier & Serville, MS name, prior to 1828.

A ♀ labelled 'java.' standing over the drawer-label '*Javanica*' in the so-called Latreille Collection in OUM [see, for this collection, Baker, 1994] is *polynesia*. This is very probably the specimen referred to by Lepeletier & Serville (1828: 481): 'Nota. Nous possédons une espèce de l'île de Java, très-voisine de la *Stélide rufiventre*'.

Stelis abdominalis Smith, 1858: 7; ♂; Celebes. Holotype ♂ OUM. Junior secondary homonym of *Thynnus abdominalis* Fabricius, 1793, = *Euaspsis abdominalis* (Fabricius) (Ethiopian).

A ♂ in the OUM type collection (ex W.W. Saunders' collection), labelled 'Mak' [white disc, = Celebes: Makassar (A.R. Wallace)] and '*Stelis abdominalis* Smith' [blue paper] is the **holotype** of Smith's species and has been labelled accordingly. An associated ♀, labelled 'Bac' [white disc, = Bachian (A.R. Wallace)] and '*Stelis abdominalis* Smith' [white paper], is apparently conspecific but is of no type status and has been labelled accordingly.

Euaspsis polyesia Vachal, 1903a: 97; nom. nov. for *Stelis abdominalis* 'Em ?' [Sm.]. Printer's error for *polynesia*.

Vachal attributed to this species specimens in his collection which came from 'l'île de Key', whence, no doubt, the specific name, but the Kay Islands are well to the east of the distribution indicated by Pasteels (1980: 84) for *polynesia*, '... l'Indonésie jusqu'aux Célèbes', and Vachal's material may have been incorrectly identified or incorrectly labelled. However, the species is now known from Ambon.

Euaspsis polynesia Vachal, 1903b: 173; corrected spelling; Vachal, 1904: [404], in errata.

Euaspsis smithi Friese, 1904: 137; nom. nov. for *Euaspsis abdominalis* (Smith, 1858) nec (Fabricius, 1793).

Parevaspis impressa Viereck, 1924: 745, fig. c, d; ♂ ♀; [Philippines:] Surigao, Mindanao. Holotype ♂ USNM, No. 26602. [♂ from Mindanao, Dapitan (C.F. Baker) examined.] **Syn. nov.** The paper in which this taxon was described was overlooked by Pasteels (1980).

Parevaspis basalis chinensis Cockerell, 1930: 50; ♀ ♂; Foochow district, China. The ♀ labelled by Cockerell as 'type', B.M. Type Hym. 17 a 2875, and the ♂ in the same collection labelled by him as 'cotype', both 'Foochow dist China (Kellogg.)', are normal *E. polynesia*.

Euaspsis (Parevaspis) polynesia Vachal, Popov, 1933: 377, fig. 2 (genitalia, China: Gansu, Khoisyan).

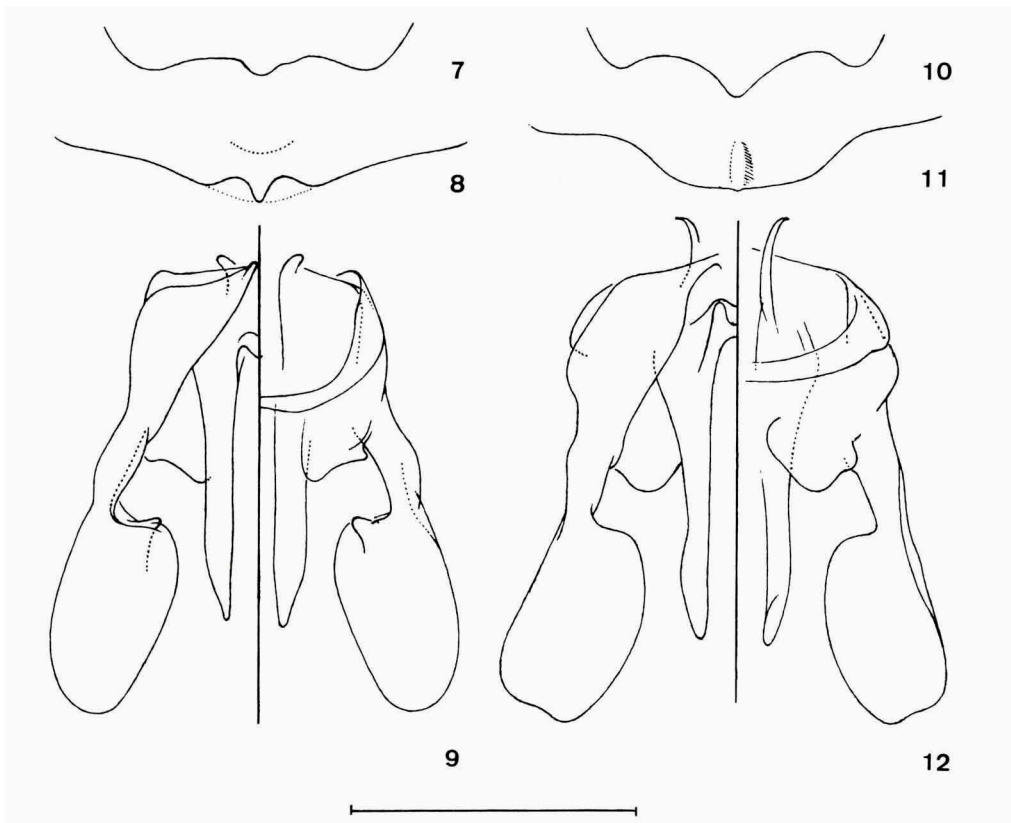
Euaspsis (Parevaspis) polyesia [sic] Vachal, Pasteels, 1980: 76-89, passim.

Additional material.— **CHINA:** Hong Kong, 1 ♂ [HNK]. [Fukien] Amoy [Hsia-men] 1 ♀ [ex Budding]; Yunnan, Ta-pin-tze (R.P. Delavay), 1 ♀ [both RMNH]. Foochow, 1 ♀ [BMNH, C.F. Wu Coll.]. Foo Chow (C.B. Rickett), 1 ♀ [BMNH, 1901-310]. **TAIWAN** [Formosa]: Pingtung-Hsien, Fangliao, 31.vii.1966 (T. Tano), 1 ♀ [HNK]. **NEPAL:** Kathmandu Valley, Godavari, 5000 ft, 31.viii.1969 (C.G. Roche, 6750), 1 ♂ (diss.). **BURMA:** Rangoon, vi.1887 (Col. C.T. Bingham), 1 ♀ [DBB, ex Ford]. Rangoon, iv.1887, 1 ♂; Middle Tenasserim, Haundraw Valley, ii.1891, 1 ♀; x.1891, 1 ♀; xi.1893, 1 ♀; viii.1894, 3 ♀ ♀; Middle Tenasserim, Yunzalin Valley, vii.1894, 1 ♀; Middle Tenasserim, Lower Salween Valley, vii.1894, 1 ♀; Tenasserim, Maulmain, v.1893, 1 ♀ (all Col. C.T. Bingham) [all BMNH]. [Bingham's records (1897: 499) of *E. abdominalis* from Burma and Tenasserim most probably all relate to this species.] S. Shan States, Pekkong [? Pekon, 19°53'N, 97°00'E], 900 m, 11.x.1934 (Malaise), 1 ♀ [RMNH]. **THAILAND:** 'Biserat, Siam: Malay States', No. 131, 1 ♀; 23.x.1901, 1 ♀ (collector ?) [BMNH]. Loei, 300 m, 17°29'N, 101°35'E, 13.vii.1986, 4 ♂ ♂ (1 diss.) 1 ♀; 13 km SW Hat Yai, 100 m, 6°56'N, 100°23'E, 24.vii.1986, 1 ♂ (diss.); Satun, 6°37'N, 100°04'E, 25.vii.1986, 1 ♂ (all R. Hensen) [all RMNH]. **VIETNAM:** Tonkin, Hoabinh, viii.1918 (R.V. de Salvaza), 1 ♀ [BMNH]. **LAOS:** Xiengkhouang, 1200 m, 4.viii.1993 (H. Nagase), 1 ♀ [HNK]. **WEST MALAYSIA:** Penang, 5.ix.1964, 1 ♀; Penang, in house, 22.iii.1966, 1 ♀, 5.iv.1966, 1 ♀, 19.vii.1966, 1 ♀; Butterworth, in house, 12.x.1935, 1 ♀; Malacca, Pulau Gadong, 15.ix.1936, 1 ♂ (diss.), 1 ♀, 16.ix.1936, 1 ♀; Perak, Selama, 16.vi.1930, 1 ♀; Perak, Parit Buntar, 30.vi.1929, 1 ♀; Selangor, Kuala Lumpur, 1.viii.1928, 1 ♀, 13.v.1941, 1 ♀, 24.x.1950, 1 ♀; Selangor, Forest Research Institute, 20.iv.1961, 1 ♂ (diss.) (all H.T. Pagden); Perak, Taiping (W.B. Orme), 1 ♀ [all BMNH]. Perak, Selama, 15.vi.1930 (H.T. Pagden), 1 ♂; Perak, S. Kinta, 1910 (H.H. Banks), 1 ♀; Penang, Balik Pulau, 18.ii.1956 (H.T. Pagden), 1 ♀ [all DBB]. **SINGAPORE:** Postal District 10, 20.vi.1968 (C.G. Roche, 3975), 1 ♀ [CGR]; v.1969 (C.G. Roche, 12479), 1 ♀. **SUMATRA:** Padang, xi.1924 (C.B. K[loss]. & N. S[medley].), 1 ♀; Res. Lampongs, Mt Tanggamoos, 22.vii.-5.viii.1935 (M.E. Walsh), 1 ♀; Sumatra occid. (v. Lansberge, J.W.), 2 ♀ ♀ [all RMNH]. **BANGKA Island:** Banca (v. d. Bossche), 1 ♀ [RMNH]. **ENGANO Island:** Engano (Wienecke), 1 ♀ [RMNH]. **SEBESI Island:** [Sunda Str.]: i.1922 (Damm[erman]), 1 ♀ [RMNH]. **JAVA:**

Palaboean ratoe, Tjisolok, 2.v.1932, 2 ♂♂ 3 ♀♀, 30.v.1932, 2 ♀♀ (all M.A. Lieftinck); Palaboean, iii.1937 (C. Franssen), 1 ♂; Buitenzorg [Bogor], 250 m, 19.i.1933, at *Antigonon*, 1 ♂, 22.ii.1946, 1 ♀, i.1948, 1 ♀, 5.xii.1953, 5 ♂♂, 6.xii.1953, 2 ♂♂, 31.i.1954, 3 ♂♂ (all M.A. Lieftinck); 23.x.1930, 1 ♀, ii.1931, 1 ♀; 29.iii.1933, 1 ♀, 3.vii.1953, 1 ♀, 26.x.1953, 1 ♀, 22.i.1954, 1 ♀ (all J. van der Vecht); 23.iii.1933, 1 ♂, i.1936, 1 ♂, xii.1936, 4 | ♂♂ (all C. Franssen); Buitenzorg (J.G. Boerlage), 1 ♀; Buitenzorg, Tjimanggor, 23.xi.1928 (J. van der Vecht), 1 ♂; Buitenzorg, Tjiboeriol [?], xii.1936 (C. Franssen), 2 ♂♂; Gerangen, -jiapoes [?] (Buitenzorg), 25.ii.1935 (Dr v.d. Goot), 1 ♀; Mt Panggerango, Tjisaroea Z., 1000 m, 13.vi.1948, 3 ♂♂, 20.vi.1949, 1 ♂, 16.vi.1950, 3 ♀♀ (all M.A. Lieftinck); Karang Howoe, 30.iv.1932 (J. van der Vecht), 2 ♂♂; Djampang Tengah, iv.1935, 2 ♀♀; Djampang Tengah, Halimoen, Tjilodor, 600-800 m, v.1939, 1 ♀; Djampang Tengah, G. Tjisoeroe, 600-800 m, iii.1933, 1 ♂, 17-23.iv.[?]1940, 1 ♂, iv.19— [illeg.], 1 ♀; Djampangs, Tengah, G. Malang, 200-800 m, i.1940, 1 ♂; Djampang, Wetan Tjajaenan, 600-800 m, iv.1939, 1 ♂; Tjajunan, Djampangs, 400 m, iv.1940, 1 ♀ (all M.E. Walsh); Djampang Tengah, 500-600 m, 4.i.1940, 1 ♀, 15.vii.1941, 1 ♂, 6.viii.1941, 1 ♂; Djampangs, Tjimerang, 10.iv.1939, 2 ♀♀ (all no collector's name, ?Walsh); Wangoen, District Lengkon, Djampang Tengah, xi.1938 (J. van der Vecht), 1 ♀; Karimon Djawa, 22-30.xi.1930 (M.A. Lieftinck), 2 ♀♀; Malang [nfd], 2 ♀♀; Moeria Mts, Tjolo, 800 m, 20-24.x.1939 (M.A. Lieftinck), 2 ♂♂; Wijnkoopsbaai, Tjipanas, 10.ix.1939 (M.A. Lieftinck), 1 ♂; Tjikopo, Soekarno, 900 m, 8.ix.1940, 2 ♀♀, 19.ix.1940, 1 ♀ (all no collector's name); Tjikopo, Mt Gedeh, 700 m, 13.x.1942 (M.A. Lieftinck), 1 ♂; Mt Gedeh, Tapos, 700 m, viii.1933 (J. van der Vecht), 1 ♀; Sron dol, Samarang, viii.1909 (E. Jacobson), 1 ♂; Samarang, viii.1909, (E. Jacobson), 1 ♀; Bandoeng, 700 m, 11.iv.1940, 1 ♀, 20-23.iii.1941, 1 ♂ (atypical: tergum 1 dorsally black), 24-29.iii.1941, 1 ♂; Bandoeng, 750 m, 1.xii.1939, 1 ♂; 15.xii.1939, 1 ♀ (all J. Olthof); Bandoeng, 700 m, v.1935 (E. Jacobson), 1 ♀; Bibidjilau, xi.1935 (M.E. Walsh), 1 ♀; W. Preanger, Z. Soekaboemi, iii.1933, 1 ♀; iv.1933, 1 ♂ 1 ♀ (all J. van der Vecht); Tandjong Priok, ii.1937 (C. Franssen), 2 ♂♂; Djeroklegi, Zuid-Banjomas, 10 m, vii.1935, 1 ♀, xii.1935, 1 ♀ (F.C. Drescher); Teluk Peutjang, Udjang Kuton, 24.vii.1955 (A.M.R. Wegner), 1 ♂; Udjungkoton, 19.vii.1955 (A.M.R. Wegner), 1 ♀. Tdjang: Alang- [?], Udjungkoton, 8.vii.1955 (A.M.R. Wegner), 1 ♀; Kiuntjing near Djerukundjur, 200-300 m, x.1941 (H. Lucht), 1 ♂; G. Oengaran, C.O. Djomblang [?], 500 m, vi.1936 (Drescher), 1 ♂; Idjen Plateau, Blawan, 900 m, 27.vi.1939 (Mrs Lucht), 1 ♂; idem, 1-12.vii.1939 (Els. Lucht), 1 ♂; K.O. Blawan, Idjen-Plateau, 900-1500 m, ii.1936, 2 ♂♂, 1936, 1 ♀ (H. Lucht); Batoerraden, G. Slamet, ii.1936 (F.C. Drescher), 1 ♂; Gombong, v.1926 (L.G.E. Kalshoven), 1 ♂; Malang, Kawi, iv.1933 (Betrem), 1 ♂; Bintang, (—[illeg.]), xii.1936, (C. Franssen), 1 ♂, taken in association with '*Megachile disjuncta*' [*Chalcidodoma disjunctum* (Fabricius, 1793)]; Res. Meru Beti[c ?], vii.1972 (F.V.v.d. Veen), 1 ♀; Tjigoeha [Java ?], i.1938 (J. van der Vecht), 2 ♀♀; G. Vanggaboena, 500 m, 22.xii.1935 (M.A. Lieftinck), 1 ♀; Karang [Korong ?], Howoe, 30.iv.1932 (J. van der Vecht), 1 ♀; Goenoeng, Oengaran, xii.1909 (E. Jacobson), 1 ♀; Soekaneegara, 400-1000 m, ii.1940 (native collector), 2 ♀♀; Soekaboemi, iv.1935 (M.E. Walsh), 1 ♀; Soekaboemi, iv.1920 (J. Lindemans), 1 ♀; Kedoe, Medana, v.1909 (E. Jacobson), 1 ♀; Ngobo bij [= near] Salatiga, v.1930 (collector ?), 1 ♀; Tjolo, Gng. Moeria, 15.vii.1935 (L.J. Toxopeus), 1 ♀; Sindanglaja, vi.1935 (C. Franssen), 2 ♀♀; Sindanglaja (Dr Bolsius), 1 ♂ 1 ♀; Ambarawa (Ludeking), 1 ♂ 1 ♀; Batavia [Djakarta] (Hoens), 1 ♀; Kediri (Piepers), 1 ♀; Salatiga (Heylaerts), 1 ♀; [no exact locality] (Heylaerts), 1 ♀; [no exact locality] (Hulié), 1 ♂, 1 ♀ [all RMNH]. **BALI**: Denpasar, 50 m, 1.vi.1935 (Awibowo), 1 ♀; Oeboed bij Denpasar, iv.1940 (W. Spies), 1 ♂ 2 ♀♀; Sanur, vi.1971 (J.G. Betrem), 1 ♀ [all RMNH]. **CELEBES** [Sulawesi]: Makassar, iv.1949 (C. Franssen), 1 ♂ 1 ♀; S. Celebes, Ereng Ereng, 700 m, i.1950, 1 ♀; iii.1950, 1 ♂ (C. Franssen); S. Celebes, Binhrong [? B. Murung, = Bantimurung], 9.v.1948 (J. van der Vecht), 1 ♂; S. Celebes, Udjung Lamuru, 30.v.1948, secondary forest (J. van der Vecht), 1 ♀; N. Sulawesi, 20 km N Bitung: Tangkoko N.P., 1°34'N, 125°12'E, 0-200 m, 19.iv.1988 (R. Hensen), 1 ♀ [all RMNH]. '*Celebes*' [blue disc, probably Wallace], 'F. Sm. Coll. 79 22', and '*Sphcodes insularis* Smith. ♀' [Smith's hand, struck through and endorsed by Cockerell: 'no doubt type of *Stelis abdominalis*'], 1 ♂ [The holotypes of *Sphcodes insularis* Smith and *Stelis abdominalis* Smith are in OUM and the present specimen is almost certainly of later date - see Baker, 1993: 199, 201.]; N.E. Sulawesi, 47 km WSW Kotamobagu, Dumoga-Bone N[ational]. P[ar]k, Toraut (forest edge), 211 m, iv.1985 (Project Wallace, G.R. Else), 1 ♂ [both BMNH]. Raha, Moena, Iles Célèbes, 1 ♂ [IRSNB, Coll. J. Muller]. **PHILIPPINES**, Mindanao: Dapitan (C.F. Baker), 1 ♂ (diss.) [DBB]. Sungco, Bukidnon, 28-29.vii.1983 (C. Nozaka), 1 ♀; Malaybalay, Bukidnon, 700 m, 12.viii.1980 (T. Murota), 1 ♀ [both HNK]. **BURU**: Boeroe, 20.vii.1913 (collector ?) [RMNH]. **AMBOYNA** [Ambon]: 10 km NE Paso, 3°38'S, 128°16'E, 21.iii.1988 (R. Hensen), 2 ♀♀; Ambon City, 3°41'S, 128°10'E, 20.iii.1988 (R. Hensen), 1 ♂ (diss.); Ambon Isl., 70 m, 10.xii.1960 (A.M.R. Wegner), 1 ♀; Laha env., 16.x.1949 (M.A. Lieftinck), 2 ♀♀; Ambon, 70 m, 16.i.1961 (Wegner), 1 ♀ [all RMNH]. Moluccas, Amboina (no further data), 1 ♀ [DBB].

Distribution.— *E. polynesia* ranges from Nepal eastwards through southern China to Taiwan and [Hirashima, 1989: 686] Ishigaki, south through continental SE Asia to the Greater Sunda Islands and Bali, thence east to the Philippines, Sulawesi, and the Moluccas (Buru and Ambon: the Ambon records tend to support Vachal's record 'île de Key'). The species appears not to occur in Borneo (cf. for a similar example the melectine cleptoparasite *Thyreus novaehollandiae* Lepeletier, 1841, Lieftinck 1962: 32, fig. 9), but this may be a false impression gained from inadequate collecting. The records given above, suggesting that *polynesia* is abundant and widespread in Java but uncommon elsewhere in Indonesia, are misleading: most of the Dutch collectors had little opportunity for travelling farther than about 100 km from Jakarta (thus mainly the Bogor region), only a few being able to obtain funding for expeditions (Diakonoff, van der Vecht) or for travelling for other purposes (Franssen), or being financially independent (like Jacobson) (van Achterberg, in litt., August 1994).

Biology.— There is a single record of a male taken at *Antigonon* spec. [Polygonaceae]. A single record from Java associates *E. polynesia* with *Chalicodoma* (*Callogmegachile*) *disjunctum* (Fabricius) and Bingham (1897: 499) records that he had seen



Figs 7-12, characters in ♂ *Euaspsis*. Figs 7, 10, apical margin of tergum 7; figs 8, 11, apical margin of sternum 6; figs 9, 12, genitalia (dorsal aspect left, ventral right), in (figs 7-9) *E. trilobata* Pasteels [INDONESIA: Sumbawa Is., Dobu, 500 m, 24.viii.1950 (J. van der Vecht)] and (figs 10-12) *E. polynesia* Vachal [INDONESIA: E. Java, Idjen plateau, Blawan, 800 m, 1612. vii.1939 (Els. Lucht)]. Scale line represents 1 mm.

polynesia [as *abdominalis*] entering the nest of *disjunctum*. However, *disjunctum* could not be the host of *E. polynesia* throughout the range of the latter species, and the considerable size variation in *E. polynesia* suggests that it must have other hosts. There are numerous other regional species of *Callomegachile*.

Euaspsis yunnanensis (Wu, 1992).— Professor Michener drew the writer's attention to a paper by Dr Wu in which *Parevaspsis yunnanensis* was described, in both sexes, from Yunnan: Yongcheng, and Sichuan: Mt Emei (Wu, 1992: 1404). The description given, largely confined to sculptural characters, does not satisfactorily distinguish *yunnanensis* from *polynesia*, which in its immense range shows considerable variation in these characters; further, the comparison with *polynesia* is unhelpful since it is not clear what Mme Wu understood by *polynesia* [in her 1962 paper Mme Wu treated *E. chinensis* Cockerell, in reality a synonym of *polynesia*, as a synonym of *E. basalis* Ritsema]. Dr Wu's figure of the ♂ genitalia of *yunnanensis*, while clearly representing a species of the *polynesia* group, is inconclusive. Provisionally, *Euaspsis yunnanensis* (Wu, 1992) is regarded as a synonym of *polynesia* Vachal, 1903.

Euaspsis basalis (Ritsema, 1874)

Parevaspsis basalis Ritsema, 1874: lxxii; ♀; Japan. Type RMNH.

Stelis japonica Cameron, 1889: 19; sex not indicated [♀]; Japan. B.M. Type Hym. 17 a 1960, '*Stelis japonica* Cam. type Japan', 'Cameron Coll. 98-220'. (Vachal, 1903: 174 - synonym of *E. basalis*.)

Euaspsis (Parevaspsis) basalis var. *ruficornis* Popov, 1933: 377, 408; ♀; [China:] Gansu, Khoisyan [also given, in English, p. 408, as Hojsan]; not traced]. Holotype ZIL. (Pasteels, 1980: 84, attributes the authorship of this taxon to 'Pavlov, 1932').

Stelis signatifrons (Morawitz in coll.) Popov, 1933: 408; ♂; Korea. Nom. nud.

Euaspsis (Parevaspsis) basalis Ritsema, Popov, 1933: 377, fig. 1 (♂ genitalia; Japan: Nara).

Parevaspsis basalis Ritsema, Wu, 1965: 57, pl. 4, fig. 96, 97 (col. fig. ♀, ♂).

Other material.— CHINA: Kouy-Tchéou [♂ Kwangsi, Ku-i chou, 25°46'N 109°26'E] (Abbé Largeteau), 1 ♀ [RMNH, ex Oberthür]. JAPAN: 'Tsur I. [? Tsuru-shima, 33°37'N, 135°57'E] Holst. 98-214', 1 ♀ [BMNH]; Japan [no further data], 1 ♂; Kagoshima Prefecture, Satacho, 3.viii.1980 (H. Nagase), 1 ♂; Kanagawa Prefecture, Kamakura, 18.vii.1982 (H. Nagase), 1 ♂ [all DBB].

Distribution.— Japan [Hokkaido, Honshu, Shikoku, Kyushu (Hirashima, 1989: 686)], Korean peninsula, China, Taiwan.

Euaspsis aequicarinata Pasteels, 1980 (figs 23, 27, 30)

Euaspsis aequicarinata Pasteels, 1980: 78 (in key), 87, fig. 1i, 2e; ♀ ♂; 'Arabie [sic !], Sabah, Kalabakan 3-11.iv.1975' [recte, SABAH: Kalabakan, 3-11.iv.1973 (K.M. Guichard)]. Holotype ♀ (BMNH) not registered (examined).

Other material.— NORTH VIETNAM: 'Tonkin, Hoabinh [Tongking, Hoa Binh], Aug. 1918. R.V.de Salvaza'. Paratype ♀ (BMNH) examined. LAOS: Vangvieng, 400 m, 6.viii.1993 (H. Nagase), 1 ♀ [HNK].

The holotype has the clypeo-supraclypeal zone convex, the clypeus carinate, very coarsely but shallowly, irregularly punctate (fig. 27), the scutellum also very coarsely punctate (fig. 30). Sternum 6 with large, sharply marginate, strongly raised platform, occupying greater part of area of disc (fig. 23). Lateral margins of axillae and scutellum pale. In the paratype, sternum 6 is as in the holotype but the sculpture is

decidedly different: the punctation of both mesoscutum and scutellum is coarser and sparser and that of the clypeus denser and more distinct; further, the scutellum is subtruncate with the median apical depression obsolete.

Pasteels' remarks on the distribution of this species and on the means by which it is supposed to have arrived in Arabia ('La répartition géographique, à la fois en Arabie méridionale et en Asie du S.E. est assez extraordinaire. Il se peut qu'elle soit due à une importation de bois contenant le nid de l'hôte') may charitably be ignored.

Euaspidis wegneri spec. nov.
(figs 24, 28, 31)

Material.— Holotype ♀ (RMNH), 'N. Moluccas O m / S. BATJAN vi.-vii. / AMR Wegner 1953', and 'abdominalis ♀ Smith Topotype det. MA Lieftinck 195-'. Lieftinck's label is inexplicable, since Smith's species was described from Celebes.

Etymology.— From the name of the collector of the holotype, A.M.R. Wegner.

Description.— Length (metasoma strongly incurved) c. 16 mm, forewing 13.5 mm.

Head (fig. 28).— Clypeus convex, ecarinate; frontal carina strong, prolonged to beyond interantennal carinae, the latter anteriorly not anastomosing with frontal carina; lateral ocelli separated from occipital ridge by more than twice ($2.3 \times$ in holotype) their diameter; POL : OOL = 1 : 1.26; third antennal segment transverse, slightly more than half length of fourth.

Mesosoma.— Hamuli 22; carinae of tibia and basitarsus III strong, entire.

Metasoma (fig. 24).— Sternum 6 subacute, basal platform moderate, apically rounded.

Sculpture.— Clypeus densely, obliquely, shallowly punctate, the punctation becoming finer and confused laterad and apicad; area between interantennal carinae shallowly, reticulately punctate; vertex densely punctate, the interspaces matt, minutely coriaceous. Mesoscutum except narrowly laterally densely punctate, the punctation becoming reticulate basad; scutellum not more coarsely punctate than mesoscutum, the punctation reticulate, particularly on axillae, to subreticulate. Metasoma glossy, relatively sparsely punctate, a distinct impunctate marginal area on T1 but on T2-T4 no distinct marginal area, the punctures simply becoming sparser and finer apicad, a multiple row of closer and very fine punctures presumably delimiting the disc; T6 strongly, irregularly punctate, the punctures becoming transversely confluent apicad.

Colour.— Black; wings dark brown with coppery or, along the veins, violet reflexions; metasoma red.

Male.— Unknown.

Euaspidis diversicarinata Pasteels, 1980
(figs 13-14, 25, 29, 32)

Euaspidis diversicarinata Pasteels, 1980: 78 (in key), 88, fig. 1h; ♀; 'Arabie, Sabah [sic !], Poring Springs, 1600 ft. 6.x.' [recte, SABAH: Poring Springs, 1600 ft, 6-10.v.1973 (K.M. Guichard)], Holotype ♀ (BMNH) not registered (examined).

Other material.— EAST MALAYSIA, SABAH [N Borneo]: Bettotan, nr Sandakan, 14.viii.1927 (C.B. K[loss]. & H.M. P[endalebury].), 1 ♀ paratype (BMNH, ex F.M.S. Museums); Ulu Dusun, m. 30 Labuk Rd, 25.iv.1971 (C.G. Roche, 9738), 1 ♂; Quoin Hill, 15-22.iv.1973 (K.M. Guichard), 1 ♀ (BMNH, paratype).

Pasteels again transports Sabah to Arabia and again gives false data for a holotype. (For "♂" at the head of his description, read "♀").

The female has the clypeus ecarinate, normally punctate. Sternum 6 with small, strongly raised, marginate, discal platform, apex of platform convex (holotype) or weakly emarginate (Bettotan).

Euaspis strandi Meyer, 1922
(figs 26, 33, 34)

Euaspis (*Parevaspis*) *strand*i Meyer, 1922: 236 (in key), 239; ♀♂; 'Sikkim' [false locality: probably Philippines, Mindanao]. Syntypes: ♀♂ (MNHUB) examined.
Parevaspis bakeri Viereck, 1924: 745, figs a, b; [Philippines:] Kolambugan, Mindanao. Holotype ♂ (USNM, No. 26601) examined. The paper in which this taxon was described was overlooked by Pasteels (1980). **Syn. nov.**

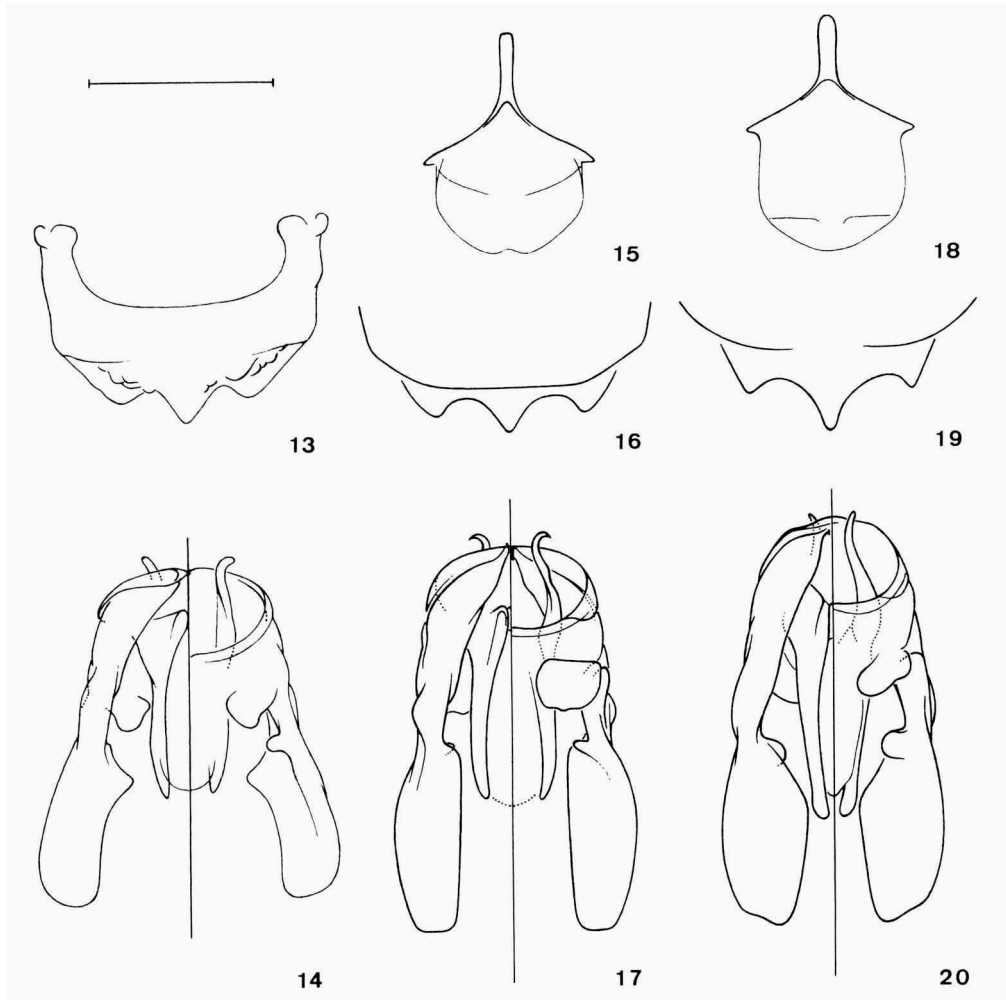
Notes on the type material.— The syntypes of *Euaspis strandi* Meyer are a pair of specimens bearing the Berlin Museum's printed label 'Sikkim ... Coll. Bingham' [on yellow paper] and Meyer's labels '*Eu: strandi* n. spec. Type ♂ [♀] [MS] Dr. R. Meyer det. [print]'. No original Bingham label is present and the specimens are neither pinned nor prepared in Bingham's customary fashion [they are on black steel nos 0 and 1 pins (no evidence of repinning), pinned vertically through the mesosoma, and unset: Bingham routinely used short, thick 'English' pins, inserted obliquely, and spread the wings and legs of his bees]. Since, further, the species has apparently not subsequently been recorded from Sikkim, or, indeed, any other part of the Indian subcontinent, and since the ♂ syntype (dissected), here designated as **lectotype**, is unquestionably conspecific with the holotype ♂ of *Parevaspis bakeri* Viereck, from Mindanao, it is apparent that the syntypes of *strand*i were mislabelled, certainly as to locality, probably also as to provenance. That Bingham did collect in Sikkim 'during one season' (Bingham, 1897: xiii) is not, of course, disputed, only whether the present specimens were among those collected by him in that year (in which instance, assuming that he would not have distinguished them from the species he recorded as '*abdominalis*' on p. 499, 'Sikkim' should have been included in the distribution given for that species), or whether they ever formed part of his collection [there are no valid grounds for Pasteels' assertion (1980: 86), which presumably arose from a misreading of the labels, that the specimens were collected by Bingham]. (Cf., for other apparent mislabelling in MNHUB, the case of *Euaspis simillima* Meyer, p. 3, and for evident mislabelling of a species described by Bingham himself, that of *Stelis cornuta* Bingham, 1897, described from 'Rangoon, Burma' but in fact a neotropical species).

The holotype of *Parevaspis bakeri* Viereck is a ♂ labelled 'Kolambugan Mindanao Baker' [print], '17235' [MS], '*Parevaspis bakeri* Type Vier. [MS] Det. H L Viereck [print]' and 'Type No. 26601 U.S.N.M.' [print, on red]. The mesosoma has been crushed and tarsus RIII is incomplete, but the type is otherwise in good condition. Viereck's figure (a) is accurate but does not indicate the presence of a small deflexed lobe at the inner basal angle of the apical lamina of the gonocoxite, more readily seen when the genitalia are viewed obliquely from above the gonobase.

Description male.— Frontal carina strong, produced to within about one ocellar diameter of median ocellus, not connected with interantennal carinae. Punctuation of clypeus coarse, shallow, irregularly subreticulate, of mesonotum (fig. 34) coarse

(coarser than in *E. aequicarinata*, *wegneri* and *diversicarinata*), dense, of scutellum coarser and denser than that of mesoscutum. Sterna 3 and 4 with long, decurving apical fimbriae; 5 basally, next to the gradulus, with a broad fascia of dense, decumbent pubescence, and, apically, weak, blunt lateral teeth and an acute median tooth or lobe; 6 concave, with sparse, weakly piligerous, punctures. Length 13 mm.

Female.— [It is by no means certain that the ♀ syntype of *E. strandi* is conspecific with or comes from the same locality as the lectotype ♂ (the ♀ of *E. lorenzae*, also from Mindanao, has not been recognized), but the association made by Meyer is provisionally recognized]. Generally similar to the ♂, the punctation of the mesonotum (fig. 33) equally coarse but denser, subreticulate. Lateral margins of scutellum



Figs 13-20, characters in ♂ *Euasps*. Figs 15, 18, sternum 8; fig 13, tergum 7; figs 16, 19, apical margin of tergum 7; figs 14, 17, 20, genitalia (dorsal aspect left, ventral aspect right), in (figs 13-14) *E. diversicarinata* Pasteels [MALAYSIA: Sabah, Ulu Dusun, m. 30 Labuk road, 25.iv.1971 (C.G. Roche, 9738)], (figs 15-17) *E. lorenzae* spec. nov. [PHILIPPINES: Mindanao, Butuan (C.F. Baker)] and (figs 18-20) *E. abdominalis* (Fabricius) [SOUTH AFRICA: Cape Province, Port St Johns]. Scale line represents 1 mm.

and axillae yellow. Sternum 6 (fig. 26) with basal platform large and apical margin obtuse.

After this paper was written, Professor C.D. Michener drew the writer's attention to a paper, in Chinese, of which he kindly provided a translation, in which Dr Wu Yan-ru recorded *Parevaspis strandi* from two localities in China [♀ ♀ from Kington, Yuen Nane Province, ♂ ♂ from Kinpin] (Wu, 1962: 168). No details that might have served to confirm the reliability of the determination were given. However, *Euaspis strandi* has now been found in a small collection of bees recently (September, 1995) submitted for determination by Dr Jaboury Ghazoul. The collection was made at flowers of the dipterocarp *Sindora siamensis* Teijsman & Miquel, a canopy tree in dry deciduous dipterocarp forest in Thailand: a single ♀ of *strandi* was taken by Dr Ghazoul at Sakaerat on 20.vi.1995. This occurrence lends credence to Meyer's locality 'Sikhim' and to Dr Wu's records. *E. strandi* now appears to have a peculiarly disjunct distribution: continental southeast Asia and Philippines.

Euaspis lorenzae spec. nov.
(figs 15-17)

Material.— Holotype ♂, [Philippines:] 'Butuan / Mindanao / [C.F.] Baker' (DBB).

Etymology.— In memoriam Lorenza Manalang (1947-1989), filia philippinensis, sodalis cara itineris crudeliter terminati.

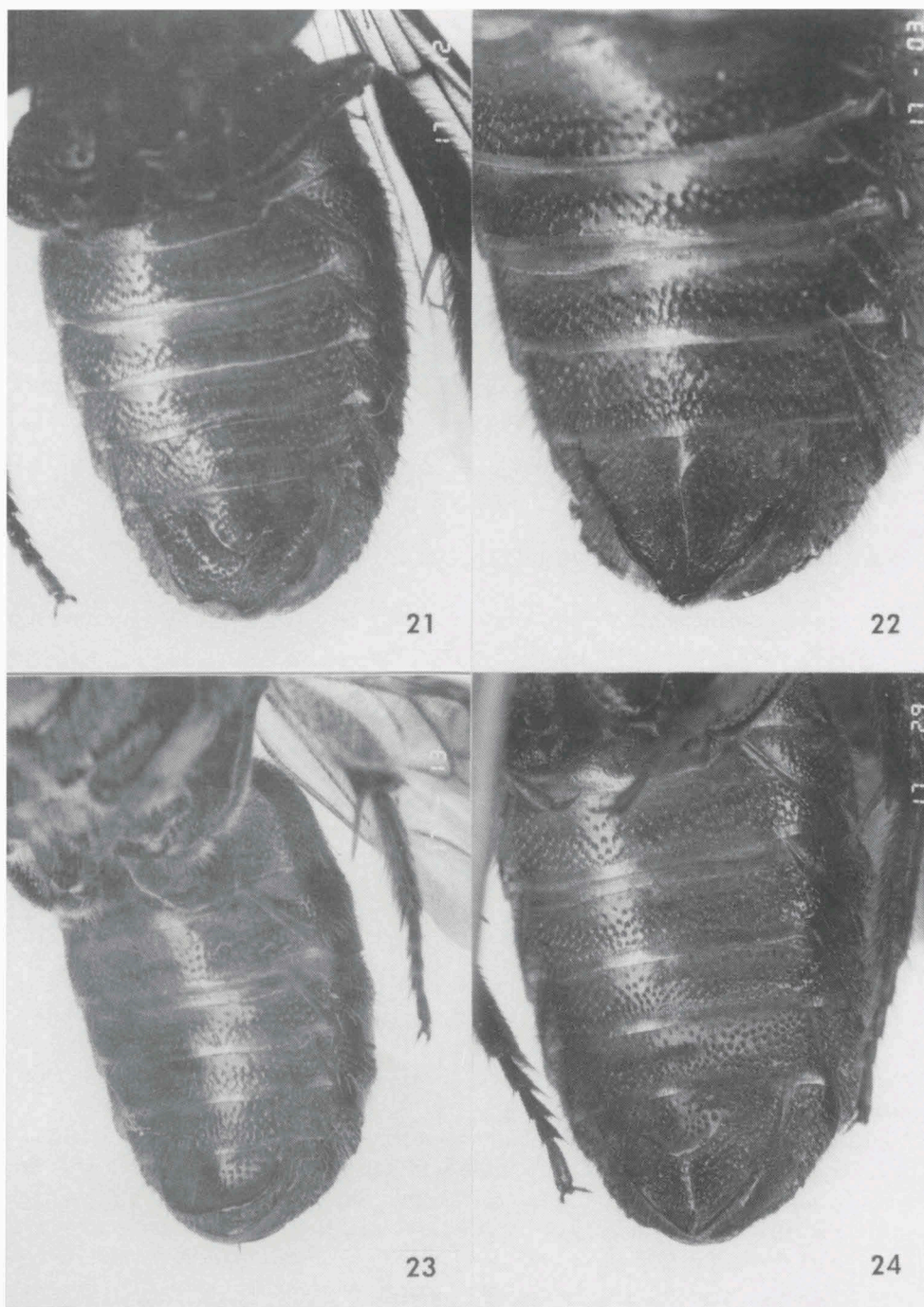
Description.— Superficially very similar, except in not having the base of the metasoma black, to the Japanese *E. basalis*. Length c. 12 mm (metasoma strongly incurved), forewing 11.5 mm.

Head.— Clypeus convex, with weak but entire median ridge; frontal carina weak, becoming obsolete within interantennal carinae; lateral ocelli separated from occipital ridge by more than twice (2.5 × in holotype) their diameter, POL : OOL = 1 : 1.3; third antennal segment transverse, twice as broad as shortest length, slightly less than half length of fourth; fourth slightly longer than broad.

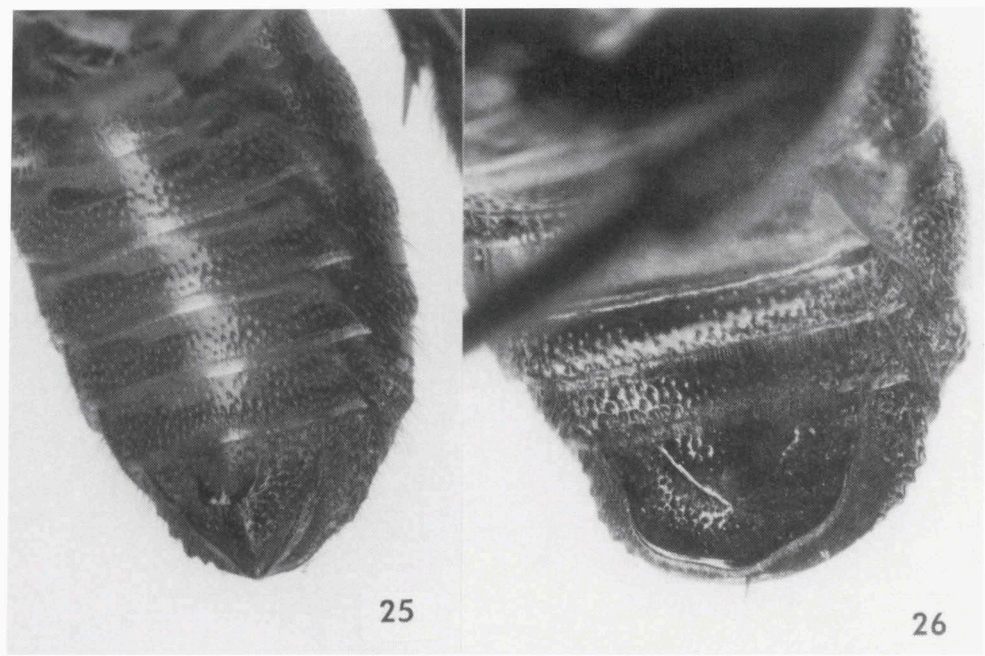
Mesosoma.— Hamuli 20; carina of basitarsus III well developed from base to apex of segment.

Metasoma.— Tergum 7 tridentate, the median tooth not greatly longer than lateral teeth but more acute (fig. 16); apical margin of sternum 5 simple; sternum 8: fig. 15; genitalia (fig. 17) with apical lamina of gonocoxite elongate and narrow [narrower than in *E. strandi* (cf. Viereck, 1924: 746, fig. 1a, as *P. bakeri*), also from Mindanao].

Sculpture.— Punctuation of head and mesosoma coarse, of metasoma relatively fine. Clypeus densely, irregularly, subreticulately punctate; face above clypeus densely, unequally punctate, the punctuation becoming sparser towards the vertex and especially above and outwardly from the lateral ocelli, the interspaces here finely coriaceous (at 37.5 ×) and with scattered minute punctures; area between interantennal carinae with distinct punctures. Mesoscutum discally densely punctate, with interspaces of up to about half puncture diameter, the punctuation becoming coarser and sparser at lateral margins and antero-lateral angles, fine on anterior convexity mesially; scutellum more coarsely and slightly less densely punctate than mesoscutum discally, the interspaces dull but not distinctly coria-



Figs 21-24, apical sterna of ♀ *Euaspsis*. Fig 21, *Euaspsis trilobata* Pasteels [INDONESIA: Sumbawa, N of Pancasila, nr Gn. Tambora, c. 500 m, 27.ix.1993 (Y. v. Nierop), neg. 144-9]; fig 22, *E. polynesia* Vachal [INDONESIA: Java, Djeroeklegi, Zuid-Banjoemas, xii.1935 (F.C. Drescher), neg. 144-7]; fig 23, *E. aequicarinata* Pasteels [holotype, MALAYSIA: Sabah, Kalabakan, 3-11.iv.1973 (K.M. Guichard), neg. 142-8]; fig 24, *E. wegneri* spec. nov. [holotype, INDONESIA: N Moluccas, S Batjan, 0 m, vi-vii.1953 (A.M.R. Wegner), neg. 142-15].



Figs 25-26, apical sterna of ♀ *Euaspsis*. Fig 25, *Euaspsis diversicarinata* Pasteels [holotype, MALAYSIA: Sabah, Poring Springs, 1600 ft, 6-10.v.1973 (K.M. Guichard), neg. 142-1]; fig 26, *E. strandi* Meyer [paralectotype, 'Sikhim' [? Philippines], neg. 144-1].

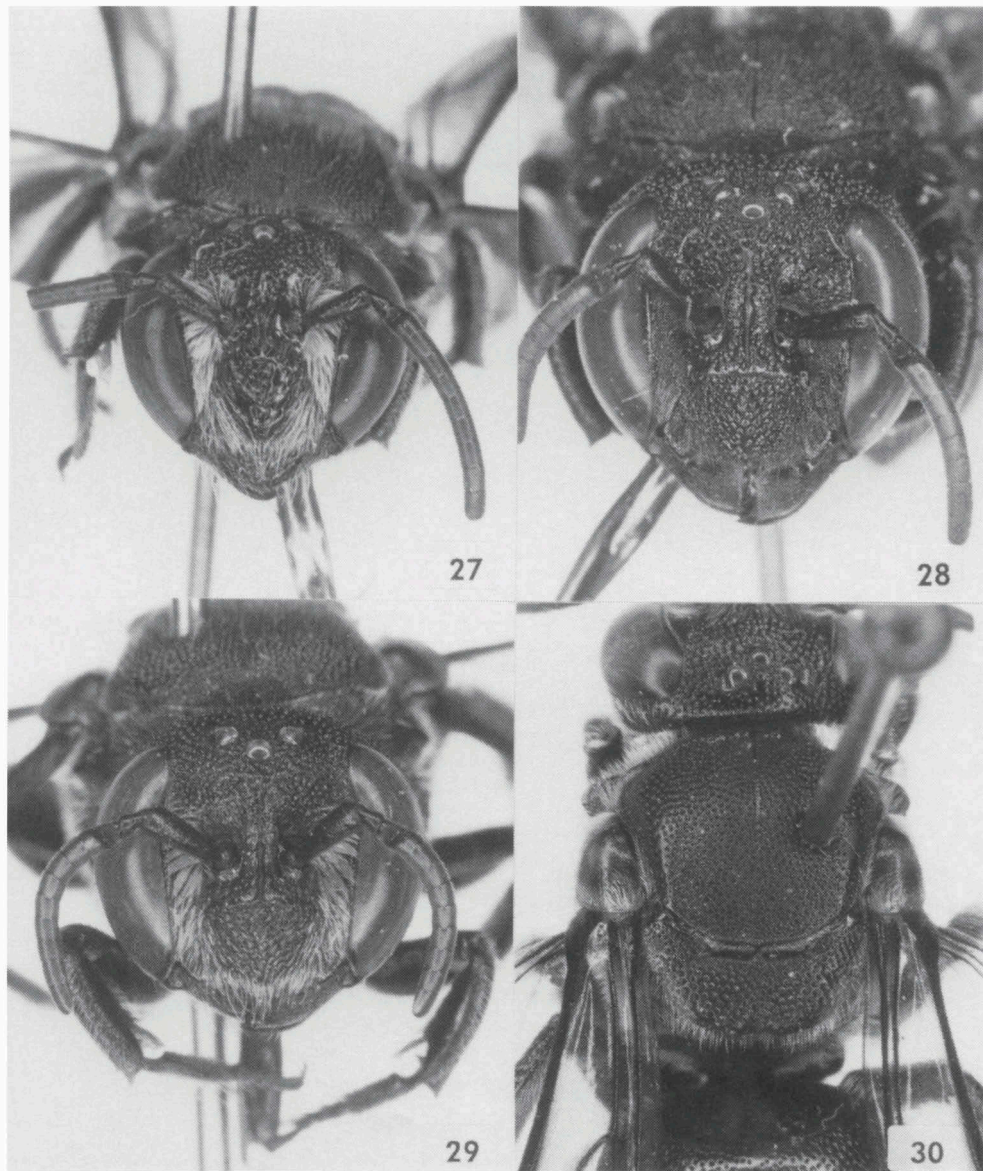
ceous. Metasoma glossy, relatively sparsely punctate, the punctures separated by up to several times their diameter discally but becoming closer on the apical terga (still separated by about one puncture diameter on tergite 5) and towards the lateral margins, fine towards the marginal areas, which are impunctate.

Colour.— Black; lateral margins of axillae and scutellum faintly red; wings dark brown, paler at base, with violet reflexions; metasoma red.

Female.— Unknown.

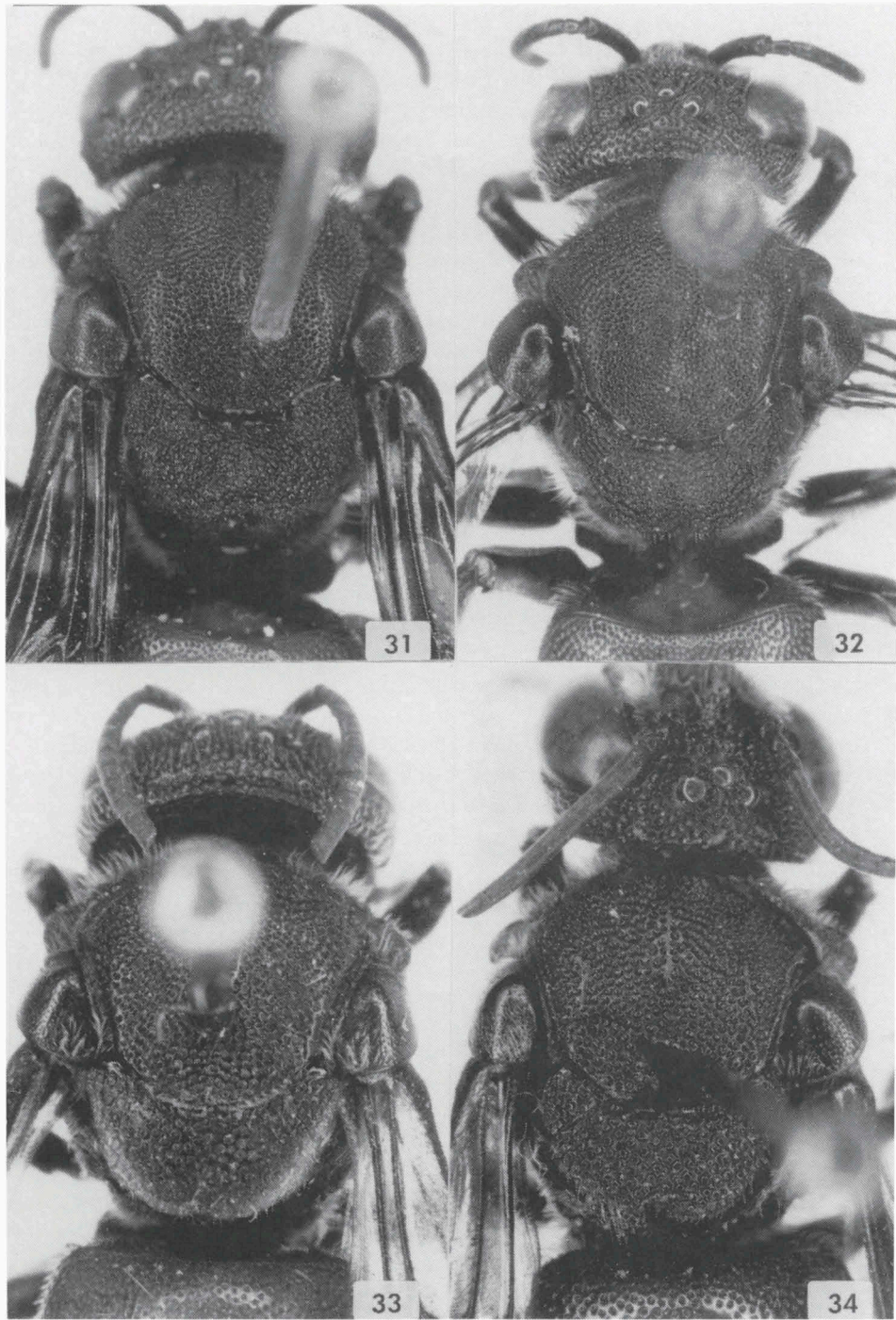
Key to females of Asian *Euaspsis*
(♀ of *E. lorenzae* not available)

1. S6 without well-defined basal platform but with distinct median carina and well-developed latero-basal teeth 2
- S6 with well-defined basal platform 4
2. Body integument black; median carina of S6 with either weak prominence or distinct tooth before mid-length (fig. 1-4); smaller species, normally < 10 mm; Indian Subcontinent 3
- Integument of metasoma red (T1 black in <0.5% of specimens examined); S6 with weak median carina posteriorly, the carina passing basad into an ill-defined, subtriangular callosity (fig. 22); normally a larger species (> 10 mm, occasionally up to 14 mm) but specimens as small as the preceding occur sporadically, probably in association with smaller hosts; widely distributed: Nepal and



Figs 27-30, characters in ♀ *Euaspsis*. Figs 27-29, head in frontal aspect; fig 30, mesonotum. Fig 27, *Euaspsis aequicarinata* Pasteels [holotype, MALAYSIA: Sabah, Kalabakan, 3-11.iv.1973 (K.M. Guichard), neg. 142-10]; fig 28, *E. wegneri* spec. nov. [holotype, INDONESIA: N Moluccas, S Batjan, 0 m, vi-vii.1953 (A.M.R. Wegner), neg. 142-17]; fig 29, *E. diversicarinata* Pasteels [holotype, MALAYSIA: Sabah, Poring Springs, 1600 ft, 6-10.v.1973 (K.M. Guichard), neg. 142-3]; fig 30, *E. aequicarinata* Pasteels [same specimen as fig 27, neg. 142-13].

Figs 31-34, mesonotum in *Euaspsis*. Fig 31, *Euaspsis wegneri* spec. nov., ♀ [holotype, INDONESIA: N Moluccas, S Batjan, 0 m, vi-vii.1953 (A.M.R. Wegner), neg. 142-19]; fig 32, *E. diversicarinata* Pasteels, ♀ [holotype, MALAYSIA: Sabah, Poring Springs, 1600 ft, 6-10.v.1973 (K.M. Guichard), neg. 142-5]; fig 33, *E. strandi* Meyer, ♀ [paralectotype, 'Sikhim' [? Philippines], neg. 144-3]; fig 34, *E. strandi* Meyer, ♂ [lectotype, 'Sikhim' [? Philippines], neg. 144-5].



- southern China to Taiwan and Sakishima guntō, south through continental SE Asia to Malesia and Philippines *E. polynesia* Vachal
3. Sternum 6 in profile (figs. 3, 4) with, normally, well developed, acutely angular, discal tooth and strongly concave, deflexed apex; the sternum also conspicuously setose, with longer, whiter, setae. Integument of vertex and mesonotum usually duller, finely coriaceous (at 37.5 ×); punctuation coarser, the interspaces narrower ..
..... *E. carbonaria* (Smith)
- Sternum 6 in profile (fig. 1, 2) with, normally, weakly developed, rarely distinctly angular, discal convexity and straight or weakly convex apex; the sternum also less conspicuously setose. Integument of vertex and mesonotum usually glossier, not evidently coriaceous; punctuation less coarse, the interspaces wider, especially on scutellum *E. edentata* spec. nov.
4. T1 black; latero-basal teeth of S6 well-developed. Distribution northern: Japan N to Hokkaido, Korean peninsula, China, Taiwan. [S6 with apical margin broadly rounded; basal platform subtriangular; no distinct carina in apical half.]
..... *E. basalis* (Ritsema)
- Metasoma wholly red; laterobasal teeth of S6 weak or vestigial. Distribution southern: Indo-China and Malesia 5
5. Platform of S6 strongly raised, occupying greater part of area of normally exposed surface of sternum (the metasoma in museum specimens of ♀ *Euaspsis* is commonly strongly incurved with consequent telescoping of the sterna) (fig. 23); punctuation of clypeus exceptionally coarse, irregular (fig. 27), of scutellum much coarser than that of mesoscutum (fig. 30); Indo-China, Greater Sunda Is.
..... *E. aequicarinata* Pasteels
- Platform of S6 occupying less than half of exposed surface of sternum; punctuation of clypeus normal for genus, regular (cf. figs 28, 29), of scutellum, if coarse (*strandii*, fig. 33), not greatly coarser than that of mesoscutum 6
6. Platform of S6 subrectangular, strongly raised apicad (fig. 25); apex of S6 subacute; Borneo (Sabah). [Sculpture of face, fig. 29; of mesoscutum, fig. 32, reticulate] *E. diversicarinata* Pasteels
- Platform of S6 hemielliptical; apex of S6 variable 7
7. Apical margin of S6 obtusely tridentate (fig. 21); smaller species; Lesser Sunda Is.
..... *E. trilobata* Pasteels
- Apical margin of S6 simple, obtuse or subacute; Philippines, Moluccas 8
8. Apical margin of S6 obtuse, basal platform larger, more angular (fig. 26); mesoscutum (fig. 33) more coarsely, subreticulately, punctate, lateral margins of scutellum and axillae yellow; Philippines [?: see text]
..... *E. strandii* Meyer (paralectotype)
- Apical margin of S6 subacute, basal platform smaller, more rounded (fig. 24); mesoscutum (fig. 31) more finely, posteriorly reticulately, punctate, mesosoma wholly black; Moluccas (Bacan) *E. wegneri* spec. nov.

Key to males of Asian *Euaspsis*

(♂ ♂ of *E. aequicarinata* and *wegneri* not available)

1. Apical lamina of gonocoxite shorter, less than twice as long as width at mid-length, oval (more ovate in *edentata*); S6 more or less densely punctate, with

- conspicuous, erect pubescence; mainly smaller species (*basalis* and large examples of *polynesia* approach size of next group); colour of integument variable 2
- Apical lamina of gonocoxite longer, more than twice as long as width at mid-length, more or less regularly oblong (curving, with inner basal angulation in *E. lorenzae*), with conspicuous long setae; S6 discally impunctate and glabrous or sparsely punctate and weakly pubescent; larger species; metasoma always red 6
2. Body integument entirely black; Indian Subcontinent 3
 - T1 black or metasoma entirely red 4
 3. Sternum 6 markedly concave, apical margin weakly concave with minute median angular projection. Genitalia: fig. 5. Integument of vertex and mesonotum usually duller, finely coriaceous (at 37,5 ×); punctation coarser, the interspaces narrower *E. carbonaria* (Smith)
 - Sternum 6 less concave, apical margin weakly convex in middle third. Genitalia: fig. 6. Integument of vertex and mesonotum usually glossier, not evidently coriaceous; punctation less coarse, the interspaces wider, especially on scutellum *E. edentata* spec. nov.
 4. T1 black; genitalia as figured by Popov (1937: 377, fig. A: note form of penis valves); distribution northern: Japan N to Hokkaido, Korean peninsula, China, Taiwan *E. basalis* (Ritsema)

Metasoma entirely red; distribution southern (but *polynesia* extending north to Nepal, southern China and Philippines) 5
 5. Apical margin of S6 with apparent biemargination forming a small median tooth, but real margin here membranous, transparent, intact (fig. 8); genitalia fig. 9; marginal teeth of T7 short, blunt (fig. 7); Lesser Sunda Is. *E. trilobata* Pasteels
 - Apical margin of S6 unmodified, but a rudimentary apical median carina present (fig. 11); genitalia fig. 12 (see also Viereck, 1924: 746, fig. c [as *P. impressus*] and Popov, 1937: 377, fig. B); marginal teeth of T7 more prominent (fig. 10); widely distributed, Nepal and southern China to Taiwan and Sakishima guntō, south through continental SE Asia to Malesia and Philippines *E. polynesia* Vachal
 6. Apical lamina of gonocoxite inwardly with prominent basal angulation (fig. 14); apical margins of S5 and S6 with weak indications of median teeth; S6 concave, glossy, except laterally impunctate and glabrous; Borneo (Sabah) *E. diversicarinata* Pasteels
 - Apical lamina of gonocoxite more regularly oblong, without basal angulation; apical margin of S5 with or without distinct median tooth; S6 discally glossy, sparsely punctate, finely, inconspicuously setose; Philippine Is. (Mindanao) 7

[*E. aequicarinata* (Indo-China, Greater Sunda Is.) would presumably run to this couplet (genitalia neither described nor figured by Pasteels), but should be distinguishable from all other species falling under it by the nature of the clypeal and scutellar punctation: cf. under key to females and Pasteels 1980: 87].
 7. Frontal carina strong, extending to c. one ocellar diameter of median ocellus; area between interantennal carinae with confused sculpture; fourth antennal segment quadrate; S5 with distinct lateral carinae terminating in blunt teeth, its apical margin with acute median tooth; genitalia as figured by Viereck (1924: 746, fig. a [as *bakeri*]) *E. strandi* Meyer

- Frontal carina weak, becoming obsolete within interantennal carinae; area between interantennal carinae with distinct punctures; fourth antennal segment slightly longer than broad; S5 with weak lateral projections, its apical margin without median tooth; genitalia fig. 17 *E. lorenzae* spec. nov.

Note.— The Indian species with *E. polynesia* (♀ S6 without distinct, raised basal platform, ♂ gonocoxite with short, broad apical lamina) and the Sabah/Philippine species (*E. diversicarinata*, *strandii*, *lorenzae* - ♂ gonocoxite with elongate apical lamina) form evident groups; the remaining species are all more or less isolated by clear apomorphies (e.g., ♂ S6, ♀ S6, in *E. trilobata*; clypeal sculpture in *E. aequicarinata*).

Owing to the unevenness of collecting, substantially confined to peninsular India and Java with very little material available from the vast expanses of Malesia, any distribution map based on present records would be highly misleading. The table below, indicating the approximate distribution of species, shows that the smaller, black, species (*carbonaria* and *edentata*) are western; the structurally similar 'red' species *polynesia* very widely distributed (reaching in the west the Indian subcontinent); and the generally larger, more highly modified 'red' species (all others except *basalis*, which has a more north-easterly distribution) eastern.

Table 1. Distribution of *Euaspsis* spp.

locality \ species	bas	car	ede	pol	aeq	tril	weg	div	str	lor
Korea	+									
Japan	+									
China	+									
Taiwan	+									
India		+	+							
Nepal				+						
Cont'l SE Asia incl. Malay pen.				+	+					
Greater Sunda Is. excl. Borneo				+						
Borneo (Sabah)					+					
Lesser Sunda Is.						+				
Celebes				+						
Moluccas				+			+			
Philippines				+					+	+

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Entomology and of the departmental and main libraries of the British Museum (Natural History), London.

Abbreviations

Collections:

- BMNH = Natural History Museum (formerly British Museum (Natural History)), London.
 CGR = C.G. Roche, personal collection, presently Maidstone.
 DBB = D.B. Baker, personal collection, presently Ewell.
 HNK = H. Nagase, personal collection, Kamakura [also material from other collections referred by him].
 IRSNB = Institut Royal des Sciences Naturelles de Belgique, Bruxelles.
 MNHUB = Museum für Naturkunde der Humboldt-Universität, Berlin.
 OUM = University Museum, Oxford.
 RMNH = Nationaal Natuurhistorisch Museum (formerly Rijksmuseum van Natuurlijke Historie), Leiden.
 USNM = National Museum of Natural History (formerly U.S. National Museum), Washington D.C.
 UZM = Universitetets Zoologiske Museum, København.
 ZIL = Zoological Institute, Academy of Sciences, St. Petersburg (formerly Leningrad).

Other abbreviations in keys or descriptive text.- RI-RIII, LI-LIII, refer to anterior, intermediate and posterior legs of right and left sides. S1, S2 etc refer to metasomal sterna. T1, T2 etc refer to metasomal terga. diss. (dissected): genitalia extracted.

Notes

¹ According to Horn & Kahle (1935: 42), Children's sale (through J.C. Stevens) consisted solely of Coleoptera. This is incorrect: those lots purchased by the British Museum included a considerable number of species of Hymenoptera and other orders.

² *Stelis phaeoptera* (Kirby, 1802). Other bees determined by Pasteels as *Euaspis carbonaria* included three females of *Stelis scutellaris* Morawitz, 1894 [Quetta (C.G. Nurse)].

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