

REVIEW OF THE AUSTRALIAN EPILACHNINAE (COLEOPTERA: COCCINELLIDAE)

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Abstract

The Australian Epilachninae are reviewed. *Epilachna dawkinsi* is described. New synonymies established are: *E. pardalis* (Boisduval, 1835) with *Henosepilachna vigintioctopunctata* (Fabricius, 1775); *E. doryca* (Boisduval, 1835) and *E. philippinensis* Dieke, 1947 with *H. vigintisexpunctata* (Boisduval, 1835); and *E. terraereginae* Blackburn, 1895 with *H. suffusa* (Crotch, 1874). *Henosepilachna* Li, 1961 is removed from synonymy with *Epilachna* Chevrolat, 1834. New combinations proposed are: *H. vigintisexpunctata* (Boisduval), *H. cucurbitae* (Richards, 1983), *H. mjoebergi* (Weise, 1923), *H. urvillei* (Montrouzier, 1861) and *H. suffusa* (Crotch), all transferred from *Epilachna* Chevrolat. *E. undecimvariolata* (Boisduval, 1835) recorded from Tasmania is shown to be a misidentification. A key to the two genera and 10 species known in Australia is provided. A lectotype is designated for *Epilachna borealis* (Fabricius, 1775), the genotype of *Epilachna*.

Introduction

The Epilachninae are plant-feeding Coccinellidae and among the most economically important beetle pests in the world. In Australia both larvae and adults feed on the foliage of Cucurbitaceae and Solanaceae. Among these families, cultivated plants such as cucumber, marrow, pumpkin, rockmelon, squash, watermelon, zucchini, *Duboisia* spp., egg plant, potato and tomato are damaged.

The Epilachninae are characterised as follows: length 4.3-8.6 mm; upper surface pubescent; minimum distance between eyes *ca* 4 × width of any eye; eyes finely faceted; antennae inserted between, rather than before, anterior margins of eyes; mandible without basal tooth, tip of mandible multidentate; last segment of maxillary palpus axe-shaped; epipleuron horizontal without (rarely with) cavities or grooves for reception of tips of middle and hind femora; tarsal claws bifid, each with or without a basal tooth; abdominal or postcoxal lines present, complete or subcomplete.

Information on this group in Australia is fragmentary and scattered widely over the literature. Dieke's (1947) work on the *Epilachna* (*sens. lat.*) of Asia, Europe and Australia was the first comprehensive study of the genera of Epilachninae for Australia and he redescribed and/or described four species and three subspecies, including a new subspecies. Bielawski (1963) gave a further account of the Australian region and redescribed six species and two subspecies from Australia. The limited number of specimens of Australian species examined by Dieke and Bielawski did not allow them to recognise the variations in maculation and resulted in the erection of some unnecessary subspecies. In addition Dieke overlooked *Henosepilachna suffusa* (Crotch) and *Epilachna galerucinoides* Korschefsky, and Bielawski overlooked *E. galerucinoides*. Richards (1983) studied the *Henosepilachna vigintioctopunctata* complex and established the true identities of three Australian species which had previously been confused under this name.

In *Henosepilachna* (= "*Epilachna*") the pronotal (Fig. 1) and elytral spot (Fig. 9) patterns follow Dieke (1947). On the elytra none of the spots 1-6 (Fig. 9) is ever absent except in rare cases and therefore they are called persistent spots. Spots *a-h* (Fig. 9) are called non-persistent spots because their presence, even in the same species is very variable.

The following abbreviations are used for collections from which specimens have been examined: AM, Australian Museum, Sydney; ANIC, Australian National Insect Collection, CSIRO, Canberra; BCRI, Biological and Chemical Research Institute, Rydalmere; BMNH, British Museum (Natural History), London; BPBM, Bernice P. Bishop Museum, Honolulu; DPIF, Department of Primary Industry and Fisheries, Darwin; MGHN, Museum Guimet d'Histoire Naturelle, Lyon; MM, Macleay Museum, University of Sydney; MNHN, Museum National d'Histoire Naturelle, Paris; MV, Museum of Victoria (former National Museum of Victoria), Melbourne; NM, Naturhistorisches Museum, Basel; PANI, Polska Akademia Nauk Instytut Zoologiczny, Warszawa; PDPI, Department of Primary Industry, Konedobu, Papua New Guinea; QDPI, Queensland Department of Primary Industries, Indooroopilly; QM, Queensland Museum, Brisbane;

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SAM, South Australian Museum, Adelaide; SDA, Sarawak Department of Agriculture, Kuching; UMZ, University Museum of Zoology, Cambridge, England; UQIC, University of Queensland Insect Collection, Brisbane; USNM, U.S. National Museum, Washington D.C.; VDA, Victorian Department of Agriculture, Burnley; WADA, Western Australia Department of Agriculture, Perth; WAM, Western Australian Museum, Perth; WARI, Waite Agricultural Research Institute, University of Adelaide; ZMUC, Zoologisk Museum Universitets, Kobenhavn.

Key to Australian genera and species of Epilachninae

1. Tarsal claws without basal tooth (**Epilachna**) 2
Tarsal claws with basal tooth (**Henosepilachna**) 3
2. Elytra reddish brown with 18 black spots (Fig. 33) **E. dawkinsi**
Elytra light reddish brown with 4 large black spots (Fig. 35) **E. galerucinoides**
3. Elytra black, reddish black or brownish black with 6 or 8 yellow, orange or red spots, some coalescing or black pigment reduced and elytral spots obscured or absent 4
Elytra light brown or reddish brown with 10 or more black spots (Fig. 9), some coalescing 5
4. Elytra black with 6 yellow or reddish brown spots (Fig. 31) or with spots coalescing (Fig. 32) **H. guttatopustulata**
Elytra reddish black or brownish black with 8 red or orange spots (Fig. 30), or black pigment reduced and elytral spots obscured or absent **H. suffusa**
5. Elytral apex rounded (Fig. 37) 6
Elytral apex with distinct angle (Fig. 36) 8
6. Each elytron with 6-14 spots 7
Each elytron with 5 spots (spot 6 absent, see Fig. 9), some or all coalescing (Figs 20-28) **H. mjoebergi**
Each elytron with 5 spots (spot 3 absent, see Fig. 9), only spots 1 and 2 coalescing **H. urvillei**
7. Each elytron with 6 spots, spots 1 and 2 not coalescing (Fig. 29) **H. boisduvali**
Each elytron usually with 14 spots, sometimes some absent but with > 6 spots (Figs 17-19) **H. cucurbitae**
8. Visible abdominal sternite 6 not split (male) (Fig. 38) 9
Visible abdominal sternite 6 split (female) (see Fig. 39) 10
9. Median lobe (in lateral view) slightly bent dorsally at *ca* apical $\frac{1}{3}$, ending in a strongly curved hook; lower edge emarginate and upper edge with distinct protuberance just after bend (Fig. 7) **H. vigintioctopunctata**
Median lobe (in lateral view) distinctly bent dorsally at *ca* apical $\frac{1}{3}$, ending in a slightly curved hook, emargination and protuberance poorly indicated (Fig. 15) **H. vigintisexpunctata**
10. Genital plates (in ventral view) short and wide (Fig. 8), notch on inner edge *ca* $\frac{1}{2}$ length of plate **H. vigintioctopunctata**
Genital plates (in ventral view) elongate and narrow (Fig. 16), notch on inner edge *ca* $\frac{1}{6}$ length of plate **H. vigintisexpunctata**

Henosepilachna Li

Henosepilachna Li in Li and Cook, 1961: 35; Fürsch, 1963: 51; 1964: 182; Bielawski, 1965a: 535; 1965c: 227; Sasaji, 1971: 307, 309; Hoang, 1977: 137; Pang and Mao, 1977: 327. Type species *Coccinella sparsa* Herbst (= *Coccinella vigintioctopunctata* Fabricius), by original designation.

Epilachna Dieke (not Chevrolat), 1947: 22.

Epilachna Kapur (not Chevrolat), 1967: 152.

Epilachna Richards (not Chevrolat), 1983: 14.

Diagnosis

Tarsal claws bifid with wide basal tooth. Six abdominal sternite of female split longitudinally.

Comments

The genus *Henosepilachna* was erected by Li and Cook (1961). It was

distinguished from *Epilachna* Chevrolat (type species *E. borealis* (F.)) by having a basal tooth on each claw, a divided sixth abdominal sternite in the female, and male genitalia usually with an apical thorn on the parameres, a basal knife-edge and setae on the median lobe.

Kapur (1967) re-examined the female example of *E. borealis* and found the sixth abdominal sternite to be longitudinally divided in the middle. He rejected *Henosepilachna* and continued to follow Dieke's erroneous interpretation of the anatomy of *E. borealis*. However, the sixth abdominal sternite of the lectotype of *E. borealis* is entire (undivided) (see comments under *Epilachna* Chevrolat). Richards (1983) supported Kapur and regarded *Henosepilachna* as a synonym of *Epilachna*.

The structure of the sixth sternite of the female and the structure of the claws are the key characters of the two genera. In some Asian species of the subfamily in which the division of the sixth sternite is obscure, however, the 2 key characters can be used together to separate species of *Henosepilachna* from that of *Epilachna* (such as *E. enneactica* Mulsant and *E. ocellata* Redtenbacher mentioned by Kapur (1967)). Therefore these two species were determined by Dieke (1947) as belonging to "*Epilachna*" (= *Henosepilachna*) with a basal tooth on each claw and a divided sixth sternite in the female. Recent workers (Li and Cook 1961; Bielawski 1963; Bielawski 1965a, b, c; Fürsch 1964; Sasaji 1971; Gordon 1975; Hoang 1977; Pang and Mao 1977) have described and placed hundreds of African, American, Australian, Eurasian and Oceanian species in *Epilachna* or *Henosepilachna* by using the two key characters together to separate them. Both *Epilachna* and *Henosepilachna* must be regarded as distinct genera.

Henosepilachna vigintioctopunctata (Fabricius)

Coccinella vigintioctopunctata Fabricius, 1775: 84.

Coccinella sparsa Herbst, 1786: 160.

Coccinella pardalis Boisduval, 1835: 596. Syn.n.

Epilachna undecimvittata Mulsant (not Boisduval), 1850: 780-782; Crotch, 1874: 85.

Epilachna territa Mulsant, 1850: 787 (synonymised by Richards 1983: 18).

Epilachna gradaria Mulsant, 1850: 789-791.

Epilachna vigintioctopunctata (Fabricius): Mulsant, 1850: 834, Korschefsky, 1931: 26; Kapur, 1967: 152; Richards, 1983: 15.

Epilachna vigintioctopunctata ab. *pardalis* (Boisduval): Korschefsky, 1931: 26.

Epilachna vigintioctopunctata vigintioctopunctata (Fabricius): Richards, 1983: 17.

Epilachna vigintioctopunctata pardalis (Boisduval): Richards, 1983: 21.

Epilachna sparsa (Herbst): Mulsant, 1850: 837; Dieke, 1947: 29-22; Bielawski, 1957: 73; Fürsch, 1959: 2.

Epilachna sparsa sparsa (Herbst): Dieke, 1947: 32; Bielawski, 1961: 228.

Epilachna sparsa var. *gradaria* Mulsant: Dieke, 1947: 32.

Epilachna sparsa orientalis Dieke, 1947: 34 (synonymised by Richards 1983: 18).

Epilachna sparsa orientalis var. *cinerea* Dieke, 1947: 35.

Epilachna sparsa territa Mulsant: Dieke, 1947: 35.

Epilachna sparsa vigintiseppunctata Dieke (not Boisduval), 1947: 36; Bielawski, 1959: 147; Stride and Warwick, 1960: 209-212; Bielawski, 1963: 321.

Epilachna sparsa vigintiseppunctata var. *nigrescens* Dieke, 1947: 37.

Epilachna pardalis (Boisduval): Mulsant, 1850: 840.

Epilachna territa var. *indocilis* Mulsant, 1850: 788. (synonymised by Richards 1983: 18).

Epilachna gradaria var. *addita* Mulsant, 1850: 791. (synonymised by Richards 1983: 18).

Epilachna gradaria var. *vieta* Mulsant, 1850: 791.

Epilachna gradaria var. *socors* Mulsant, 1850: 791. (synonymised by Richards 1983: 18).

Epilachna gradaria var. *congressa* Mulsant, 1850: 791.

Epilachna gradaria var. *stolida* Mulsant, 1850: 791. (synonymised by Richards 1983: 18).

Henosepilachna sparsa (Herbst): Li and Cook, 1961: 40; Bielawski, 1965a: 535; 1965b: 211.

Henosepilachna vigintioctopunctata (Fabricius): Sasaji, 1971: 309; Hoang, 1977: 133.

Types—*Coccinella vigintioctopunctata*: Tranquebar, India: lectotype ♀ (ZMUC).

Coccinella sparsa: East Indies: type probably lost, see comments under *vigintioctopunctata*.

Coccinella pardalis: Vanikoro, Santa Cruz Islands: lectotype ♂ (MNHN).

Epilachna territa: Maluku: lectotype ♂ (MNHN).

Epilachna gradaria: India: lectotype ♂ (MNHN).

Epilachna sparsa orientalis: China: neotype ♂ (USNM).

Types above not examined.

Material examined—AUSTRALIA, 331 specimens: NEW SOUTH WALES: Abernethy; Avalon; Beecroft; Bilpin; Blakebrook; Cape Hawk; Cawongla; Clarence R.; Cobbitty; Dee Why; Dorrigo National Park; Eastwood; Kempsey; Gordon; Gosford; Greystanes; Grose Wold; Helensburgh; Huonbrook nr Mullumbimby; Lake Parramatta; Lismore; Mangrove Mountain; Mendooran; Merah North; Mungo Brush; Murwillumbah; Nambucca Heads; Narara; Narrabri; North Beach; Bellinger R.; Norton's Basin; Nepean R.; Roseville; Silverdale; Spring Grove; Tooloom Scrub; Tamworth; Tweed R.; Ulong; East Dorrigo; Upper Colo R.; Villawood; Williamstown; Windsor; Wisemans Ferry; Wollongbar. NORTHERN TERRITORY: Katherine R. QUEENSLAND: Lowood nr Aitkinson's Dam; Atherton; Biloela; Borallon; Brisbane; Cairns; Charters Towers; Clear Mountain; Coolum; Davies Ck nr Mareeba; Dulacca; Eagle Heights; Eidsvold; Elimbah; Emerald; E. Evelyn; Forest Hill; Gatton; Goodna; 4 km N. Harlin; Kilcoy area; Kuranda; Lamington National Park; Maleny; Mareeba; Mooloolah; Mt Coot-tha; Mt Glorious; Mt Tamborine; Macpherson Range; Redcliffe; Rosedale; Toowoomba; Upper Crossing, Teviot Brook, Boonak-Killarney Rd; Walkamin; Wide Bay; Yalkula. TASMANIA: no further data. WESTERN AUSTRALIA: Beckenham; Bunbury; Crawley; Floreat Park; Gosnells; Kelmscott; Mongers Lake; Perth; Mosman Park; Rivervale; Scarborough; Wembley. BORNEO: Labuan. FIJI ISLANDS: Moturiki; Ovalau; Viti Levu. JAVA: Depok. SARAWAK: 26 miles (42 km) K/S Rd; Lawas; Lundu; Matang; Mukah; Murat Engkilili; Nonok; Penaku; Semongok; 27 miles (44 km) Serian Rd; Serpan; Tarat Agric. Stn.; Ton Dong. TAIWAN. Specimens are in AM, ANIC, BCRI, BMNH, BPBM, DPIF, MM, MNHN, MV, PDPI, QDPI, QM, SAM, SDA, UMZ, UQIC, USNM, VDA, WADA, WAM.

Number of specimens collected by month: January, 33; February, 39; March, 77; April, 17; May, 9; June, 10; July, 15; August, 9; September, 30; October, 19; November, 4; December, 38.

Diagnosis

Length 6.4 (5.7-7.0) mm. Upper side pale brown or reddish brown. Elytra with 26 black spots about equally developed, spot *a* absent except in rare exceptions; very rarely elytra with 12 persistent spots, all non-persistent spots absent; elytral apex distinctly angled.

Variation

In pale specimens, pronotal spots 1-4, 1-6 or 1-7 (Fig. 1) present; often 2 or more united; very rarely some or all faint. In dark specimens, spots 1-7 usually present, enlarged and some united. Very rarely all spots united, forming a black disk and extending to entire pronotum except lateral margins; but some spots may be recognisable.

In general all 26 black spots small in pale specimens (Fig. 2) and enlarged in dark specimens (Fig. 3). Spots variable in size but usually persistent spots larger than non-persistent spots. Some spots joined to margins/suture. Spot *a* rarely present, small or faint, on basal margin of elytron (Fig. 4). Sometimes 2 or more non-persistent spots coalescing (i.e. *b* + *c*, *b* + *d*, *e* + *g*, *g* + *h*, *e* + *g* + *h*, *b* + *c* and *e* + *f*, *b* + *c*, and *g* + *h*, or *c* + *b* + *d* and *f* + *e* + *g*; 2 persistent spots rarely coalescing (i.e. 1 + 2 or 3 + 5). One specimen with 22 spots, spots *a*, 3 and 4 missing (Fig. 5) and another with 24 spots, spots *a* and 4 missing and spots 3 small. Only one specimen with pronotum spotless and 12 persistent spots on elytra (Fig. 6).

Genitalia

Male median lobe (Fig. 7) slightly bent dorsally, ending in a strongly curved hook; lower edge emarginate and upper edge with a distinct protuberance just after bend. Female genital plates (Fig. 8) short and wide, with short notch on inner edge (length ca $\frac{1}{2}$ that of genital plate). See also descriptions and figures for *sparsa* given by Dieke (1947) and Li and Cook (1961), for *sparsa vigintisex punctata* by Bielawski (1963), and for *vigintioctopunctata pardalis* by Richards (1983).

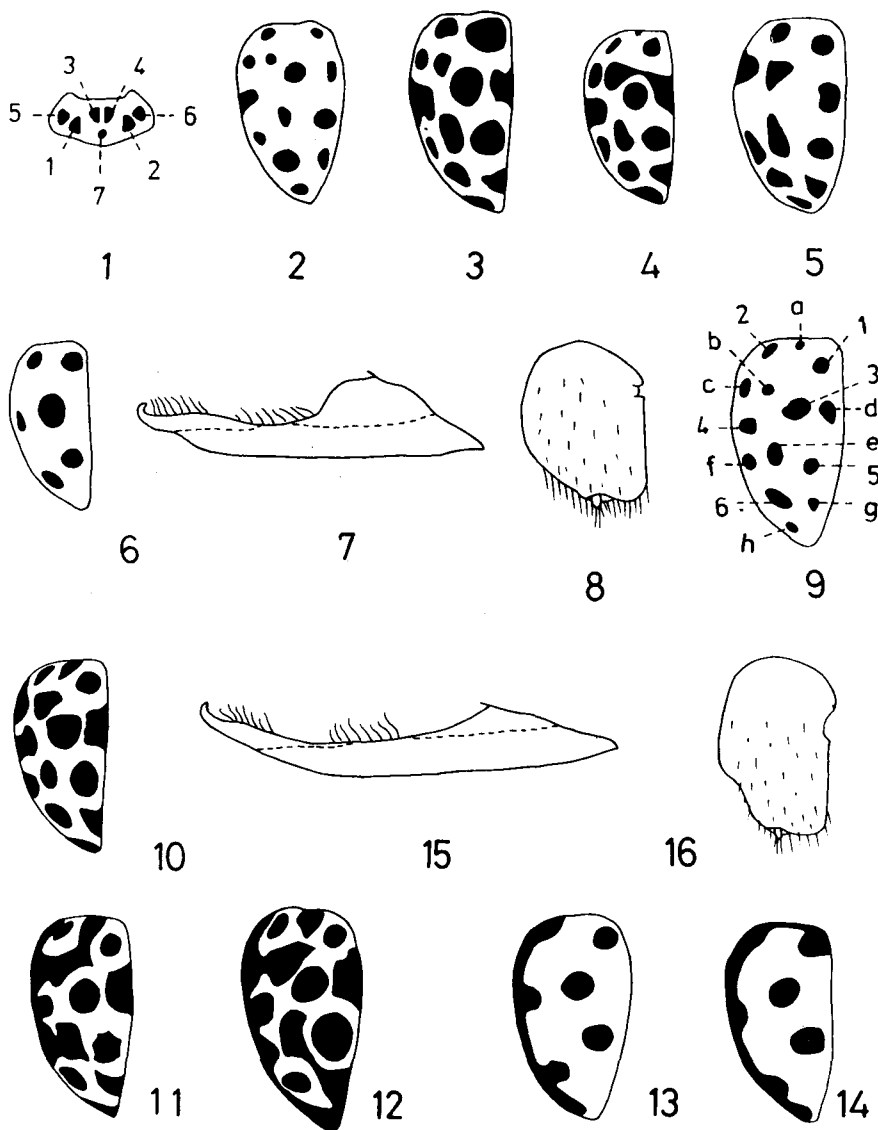
Distribution

This species is widely distributed over Asia and Oceania, between northern China and central Japan in the north, Afghanistan in the west, Fiji and Samoa in the east, and Australia in the south.

Comments

Richards (1983) examined a ♀ syntype of *vigintioctopunctata* and designated it as lectotype. However, she did not examine the type of *sparsa* and followed Mulsant (1850) and Kapur (1967) in regarding *sparsa* as a synonym of *vigintioctopunctata*. The type of *sparsa* could not be located at the Universität Humboldt, Berlin and is probably lost. Thus the identity of *sparsa* remains in doubt.

Dieke (1947) divided *sparsa* into four geographical subspecies: *sparsa sparsa*, *sparsa orientalis*, *sparsa territa* and *sparsa vigintisex punctata*. Li and Cook (1961) considered these as forms of a single highly variable species. Richards (1983) synonymised the first three subspecies *vigintioctopunctata vigintioctopunctata* and the last subspecies with the subspecies *vigintioctopunctata pardalis*.



FIGS 1-16—*Henosepilachna* spp.: (1-8) *H. vigintioctopunctata*: (1) pronotum, spots numbered; (2-6) left elytra; (7) male median lobe, lateral; (8) female genital plate, ventral; (9-16) *H. vigintisexpunctata*: (9-14) left elytra; (9) persistent spots numbered 1-6 and non-persistent spots a-h; (15) male median lobe, lateral; (16) female genital plate, ventral.

I have examined more than 360 specimens of this species from Australian and Oriental regions and found that the shape, size and colour of the body, the number and size of the pronotal/elytral spots vary considerably among the specimens from one and/or different localities. Among Australian specimens examined *sparsa sparsa* (Fig. 6), *sparsa orientalis* (Fig. 4), *sparsa territa* (Fig. 3) or *sparsa vigintisexpunctata* (Fig. 2) could be identified. These are respectively identical to 12-spotted, 28-spotted, dark 26-spotted and pale 26-spotted forms of this species described here. In other words, all the four forms or subspecies of this species occur in Australia. The first two and the last two correspond to *vigintioctopunctata vigintioctopunctata* and *vigintioctopunctata pardalis*, respectively, according to Richards' (1983) criteria.

Although the maculations are somewhat different, such differences are also observed within other species of *Henosepilachna*. In the absence of genital differences

and any true geographical separation of these forms or subspecies, it is reasonable to consider them all as forms of a single highly variable, polymorphic and widely distributed species.

In Australia, three species of *Henosepilachna*: *vigintioctopunctata*, *vigintisexpunctata* (Boisduval) and *cucurbitae* (Richards) are similar in appearance. However, the elytral apex is distinctly angled in the first two species and round in the last species. In addition, *cucurbitae* can also be recognised by genital characters. The tip of the siphon of *cucurbitae* is round, with a deep notch, but is pointed without a notch in others. Female genital plates of *cucurbitae* are somewhat semi-elliptical, being about as broad at both basal and apical parts and with a deep, semicircular notch; those in the other two species are more broad at the basal than the apical part, with a shallow, non-semicircular notch (Figs 8 and 16). In regard to *vigintioctopunctata* and *vigintisexpunctata*, no single constant external character can be used to separate them, so examination of the male and female genitalia is the only reliable way to distinguish between them (see key).

H. undecimvariolata (Boisduval) was recorded from Tasmania by Mulsant (1850) from Guérin's collection but has not been reported again from Australia except for Crotch (1874) repeating Mulsant's record. *H. undecimvariolata* superficially resembles *vigintioctopunctata*, *vigintisexpunctata* and *cucurbitae*. A specimen labelled "*Epilachna 11-variolata*" Muls. p. 780, Van Dieman" and "Museum Paris col. Guérin-Meneville" from MNHN was examined (according to the information on the label and depository, this specimen is very likely to be the original one identified by Mulsant) and the female genitalia are identical with those of *vigintioctopunctata*. Thus *undecimvariolata* was erroneously recorded from Tasmania by Mulsant (1850).

In addition, another specimen which was labelled "*11-variolata* and Guérin" on one side of the label, "Mulsant" and "Triton Bay" on the other side, from Crotch's collection in UMZ was examined. It is also *vigintioctopunctata* according to the male genitalia.

***Henosepilachna vigintisexpunctata* (Boisduval), comb.n.**

Coccinella vigintisexpunctata Boisduval, 1835: 590.

Coccinella doryca Boisduval, 1835: 597. Syn.n.

Epilachna doryca (Boisduval): Crotch, 1874: 86; Korschefsky, 1931: 28, Dieke, 1947: 69-70; Bielawski, 1962: 324-326.

Epilachna doryca doryca (Boisduval): Bielawski, 1963: 326-330.

Epilachna doryca australica Dieke: Bielawski, 1963: 330-332.

Epilachna doryca philippinensis Dieke: Bielawski, 1963: 324.

Epilachna philippinensis Dieke, 1947: 40-41. Syn.n.

Epilachna philippinensis philippinensis Dieke: Chapin, 1965: 195.

Epilachna philippinensis remota Dieke, 1947: 41-42.

Epilachna philippinensis australica Dieke, 1947: 42; Stride and Warwick, 1960: 208.

Epilachna vigintisexpunctata (Boisduval): Richards, 1983: 25-26.

Epilachna vigintisexpunctata vigintisexpunctata (Boisduval): Richards, 1983: 26-30.

Epilachna vigintisexpunctata doryca (Boisduval): Richards, 1983: 30-34.

Epilachna vigintisexpunctata philippinensis Dieke: Richards, 1983: 34-37.

Henosepilachna doryca (Boisduval): Hoang, 1977: 133.

Henosepilachna doryca doryca (Boisduval): Bielawski, 1965a: 536; Bielawski, 1965c: 227.

Henosepilachna doryca philippinensis (Dieke): Bielawski, 1965a: 536.

Types—*Coccinella vigintisexpunctata*: Australia: lectotype ♂ (MGHN), paralectotypes 2 ♀♀ (MGHN), all 3 examined by Mr J. Clary, Lyon; 1 ♀ paralectotype with 26 elytral spots has been misidentified and is *vigintioctopunctata*, see comments under *vigintisexpunctata*.

Coccinella doryca: New Guinea: lectotype ♂ (MNHN), not examined.

Epilachna philippinensis: Philippine Islands: holotype ♂ (USNM), not examined.

Epilachna philippinensis remota: Philippine Islands: holotype ♂ (USNM), not examined.

Epilachna philippinensis australica: Australia: holotype ♂ (USNM), not examined.

Other material examined—AUSTRALIA, 188 specimens: AUSTRALIAN CAPITAL TERRITORY: Canberra. NEW SOUTH WALES: via Bega; Cabramatta; Clovelly; Cowan; nr Cutter's Pass, Williams R; Dapto; Dunoon; Eastwood; Eden; Georges R. Valley, Cabramatta; Gosford; Greystanes; Hornsby Heights; Kiama; Lake Parramatta; Mangrove Mountain; Merimbula; Minnamurra Falls; Mungo Brush; Narara; Otford; Oxford Falls; Richmond R.; Roseville; Sydney; Tooloom Scrub via Uverbille; Turramurra; Tweed R.; Wisemans Ferry; Wollongong; Woonona. QUEENSLAND: Babinda; Brisbane; Cairns area: Coen R.; Jaffa;

Kairi State Forest; Lake Barrine; Atherton Tableland; Lamington National Park: Lever's Plateau; nr Maleny; Mt Glorious; Mt Tamborine; 2nd Palen Ck Crossing from Rathdowney; Springbrook; Tamborine; Upper Crossing; Teviot Brook, Boonah-Killarney Rd; Wide Bay; Wongabel. WESTERN AUSTRALIA: Kimberley (?). IRIAN JAYA: Biak I., Mengrowawa; Humboldt Bay area, Pukusam Dist. West of Tami R.; Wahnes. PAPUA NEW GUINEA: CENTRAL PROVINCE: Bigianumu; Brown R.; Port Moresby; 14 miles (23 km) Port Moresby; EAST NEW BRITAIN PROVINCE: Kerevat via Rabaul; North Bainings, Killin Wata, Patonga Rabaul; Vudal Agric. College; MILNE BAY PROVINCE: Woodlark I., Kulumadu Hill; MOROBE PROVINCE: Wareo, Finschhaven. NEW IRELAND PROVINCE: East Coast, Kapsu Ptn.; Namatanai; Onermarang; NORTH SOLOMON PROVINCE (BOUGAINVILLE): Boku; Buin; NORTHERN PROVINCE: Bisi Ptn.; Deblau Ptn.; Mt Lamington; WEST NEW BRITAIN PROVINCE: Nahavio; WESTERN PROVINCE: Oriomo Stn. SARAWAK: Murat Engkilili; Nonok. SOLOMON ISLANDS. Specimens are in AM, ANIC, BCRI, BMNH, BPBM, DPIF, MGHN, MNHN, MV, PDPI, QDPI, QM, SAM, SDA, UQIC, USNM, WADA, WAM.

Number of specimens collected by month: January, 7; February, 21; March, 66; April, 20; May, 16; June, 7; July, 7; August, 2; September, 8; October, 13; November, 14; December, 7.

Diagnosis

Length 6.1 (5.8-7.3) mm. External morphology and colour pattern almost identical to *H. vigintioctopunctata*: elytra with 28 black spots, these variable in size, rarely either spot *a* small or faint or all non-persistent spots absent leaving the 12 persistent spots; elytral apex distinctly angled.

Variation

In pale specimens, pronotum with black spots 1-4, or 1-4 and 7; 3 + 4 or 3 + 4 + 7 united (see Fig. 1); sometimes some or all faint. In dark specimens, pronotum with black disk (sometimes spots 5 and 6 recognisable) extending to entire pronotum except lateral margins, lateral and anterior margins or all margins round, occasionally spots 1 + 3 + 4 + 2 + 7 united, forming black disk but 1, 2 and 7 may be recognisable.

In specimens with 28 elytral spots, spots variable in size; persistent spots larger or smaller than non-persistent ones. In pale specimens, spots small; sometimes 1 or 2 touching lateral margins; spot *a* small or faint and close basal margin of elytron (Fig. 9). One specimen with spot 3 missing on 1 elytron and another with spot *h* missing. In dark specimens, spots tend to enlarge and join margins/suture (Fig. 10), or coalesce (i.e. 2 + *c*, 3 + 5, *a* + *b*, *b* + *c*, *e* + *g*, *g* + *h*, *a* + *b* + *c*, *c* + 4 + *f*, 2 + *c* and *e* + *g*, *a* + *b* and *g* + *h*, *b* + *c* and *e* + *g*, 2 + *c* + 4 + *f*, 2 + *c* + 4 + *f* and *g* + *e*, 2 + *c* + 4 + *f* and *h* + *g* + *e*, 2 + *c* + 4 + *f* + *e* + *g* + *h* and *a* + *b*, *a* + *b* + *c* + 4 + *f* + *e* and *c* + 2 (Fig. 11), *b* + *c* + 4 + *f* + *e* + *g* + *h* or *b* + *c* + 4 + *f* + *h* + *g* + *e* (Fig. 12)). In 4 specimens (spots 1-4 on pronotum) with only the 12 persistent spots on elytra, spots large and some coalesce (i.e. 2 + 4 + 6 in 1 (Fig. 13), 1 + 2 + 4 + 6 in 2 (Fig. 14), and 4 + 2 + 3 + 5 + 6 in 1).

Genitalia

Male median lobe (Fig. 15) similar to that of *H. vigintioctopunctata* but distinctly bent dorsally, ending in slightly curved hook; emargination nearly straight and protuberance feeble. Female genital plates (Fig. 16) rather elongate and narrow, with long notch (length ca % of genital plate). See also descriptions and figures for *philippinensis* and *doryca* given by Dieke (1947), and for *doryca australica* by Bielawski (1963), and for *vigintisexpunctata* by Richards (1983).

Distribution

Aru, Australia, Bougainville, Java, Micronesia, New Britain, New Guinea, New Ireland, northern Vietnam, Philippines, Sarawak, Solomon Islands, Waigeo, Woodlark.

Comments

Richards (1983) examined the lectotypes of *C. vigintisexpunctata* and *C. doryca* and the holotype of *E. philippinensis* and regarded the last two as subspecies of the former on the grounds of similarity of genitalia, maculation and melanisation of ground colour.

Recent examination of more than 180 specimens of this species from Australia resulted in specimens from Queensland being identified as *vigintisexpunctata doryca*, *vigintisexpunctata philippinensis* and *vigintisexpunctata vigintisexpunctata* which are relatively identical to 12-spotted, pale 28-spotted and dark 28-spotted forms of this species described here (as in Figs 13-14, 9 and 10-12, respectively). Such maculation differences are often observed in species of *Henosepilachna*. As there is no geographical separation or differences in genitalia between these subspecies, they must be regarded as forms of a single highly variable, polymorphic and widely distributed species.

This species is similar to *vigintioctopunctata*, *cucurbitae* or *boisduvali* (Mulsant). It can be distinguished from *vigintioctopunctata* by different male and female genitalia and from *cucurbitae* or *boisduvali* by the elytral apex distinctly angled.

Richards (1983) designed a lectotype and two paralectotypes noting one female paralectotype with 26 elytral spots and three fused groups of spots on the pronotum. From its colour and maculation it appeared that this paralectotype could be *vigintioctopunctata*. Mr J. Clary, MGHN, dissected and sketched the genitalia of the lectotype and the two paralectotypes of this species at my request. The genitalia of the female paralectotype with 26 elytral spots are very similar to those of *vigintioctopunctata* (see Figs 8 and 9 for *vigintioctopunctata pardalis* given by Richards (1983)). Thus this paralectotype is *H. vigintioctopunctata* not *H. vigintisepunctata*.

Henosepilachna cucurbitae (Richards), comb.n.

Epilachna cucurbitae Richards, 1983: 37-40.

Epilachna vigintioctopunctata Dieke (not Fabricius), 1947: 42-46; Stride and Warwick, 1960: 209-210, 212-213; Bielawski, 1963: 335-339.

Epilachna vigintisepunctata Mulsant (not Boisduval), 1850: 838 (in part).

Types—*Epilachna cucurbitae*: NEW SOUTH WALES: all labelled Kensington 11.xii.1977, ex zucchini, A. M. Richards; *holotype* ♂, *allotype* ♀ and *paratypes* 2♂♂ (ANIC); other *paratypes*: 2♂♂, 2♀♀ (BMNH); 3♂♂, 1♀ (BPBM); 1♂, 1♀ (USNM); 2♂♂, 1♀ (AM); 1♂, 1♀ (SAM); all types not examined.

Material examined—AUSTRALIA, 559 specimens: NEW SOUTH WALES: Abernethy; Austinmer; Baulkham Hills; Beverley Hills; Bilpin; Blaxland; Cabramatta; Chatswood; Clarence R.; Cliefden-Lyndhurst; Como; Concord; Condoblin; Coolah; Dorrigo; Dubbo; Dunedoo; Enmore; Fairfield; Goodman's R.; Wollondilly R.; Gordon; Grafton; Graman; Granville; Helensburgh; Kiama; Lismore; Macleay R.; Mascot; Mendooran; Merah North; Merrylands; Moama; Mullaley; Narara; Narrabri; Narromine; Nimbah; Oakwood; Ourimbah; W. Pennant Hills; Pilliga; Richmond; Riverstone; Roseville; Sydney; Telopea; Tweed R.; Wee Waa; Wisemans Ferry. NORTHERN TERRITORY: Alice Springs; 5 km-peg Arnhem Hwy; Bagot Reserve; Batchelor; Beeboon Crossing; Daly R. on Tipperary Stn.; Berrimah Exp. Farm; 17.29S, 129.25E, Bigley Springs, 25 km ESE Mt Panton; 17.25S, 129.34E, Campbell Spring, 38 km ESE Mt Panton; Coconut Grove; Daly R.; Darwin; Dashwood Crossing, Victoria R. Downs; Douglas R.: Horn Islet, Sir Edward Pellew Group; Howard Springs; Humpty Doo; Indianna Stn. via Alice Springs; Katherine; Katherine R.; Melville I.: Mt Wells; Nightcliff; Point Charles; Roper R.; Scott Ck; Simpsons Gap via Alice Springs; Ti-Tree; Victoria R. Downs, Irrigation Farm; Wallera Range. QUEENSLAND: Beerburum; Brisbane; Cairns; Cleveland; Condamine; Helensvale nr Cooktown; Coolum; Cunnamulla; Deeral; Eidsvold; Elimbah; Emerald; Gatton; Goondi; Gordonvale; V. Gorton's Farm, Mullet Ck via Bundaberg; Hammond I.; Highvale; Ingham; Julia Ck.; Karumba; Koah; Kuranda; Lake Moondarra, 12 miles (19 km) Mount Isa; Lakeland Downs; Lawes; N. Littabell Road, Mullet Creek; Mackay; Mary Cairncross Park nr Maleny; Mornington I.; Moura; Mt Tamborine; Mutchilba; Normanton; North Pine; Ormiston; Palm I.; Powella Aramac; Rockhampton; St George; Meteor Downs nr Springsure; Thulimbah; Toowoomba; Torres Strait (Darnley I., Moa I., Murray I., Red I.). SOUTH AUSTRALIA: N.E. Corner. VICTORIA: Wahgunyah; Yarrowonga. WESTERN AUSTRALIA: Behn R., East Kimberley; Broome; Calvert Exped; Carlton Reach; Ord R.; Derby; Forrest E. District; Ivanhoe Stn., Kimberley; Kununurra; Langey Crossing, Fitzroy R.; Mogumber; Mt Anderson Stn., Kimberley; Noonkumbah, Kimberley; Ord Gorge, Argyle Stn., Kimberley; Roebuck Bay, Wyndham. INDONESIA: ARU. PAPUA NEW GUINEA: No further data. CENTRAL PROVINCE: Aroa Ptn.; Bomana; Boregaina village; Brown R. area; Cocolands Abau Subd.; Dogura village; Eriama; 25 miles (40 km) S.E., Galia village; Hula village; Kilakila; 13 miles (21 km) Port Moresby; Konedobu; Laloki Ptn.; Lawes Rd, Hill; Poreba da; Port Moresby; 6 miles (10 km) Port Moresby; 14 miles (23 km) Port Moresby; 17 miles (27 km) Port Moresby; Rigo; EAST SEPIK PROVINCE: Wewak; EASTERN HIGHLANDS PROVINCE: Goroka; GULF PROVINCE: Maria Ptn.; MILNE BAY PROVINCE: Goodenough; Hagita; Normandy I.; Trobiand I.; Woodlark I.; MORABE PROVINCE: Erap; Mutsing; nr Pyramid Hill; NORTH SOLOMON PROVINCE: Arawa; Boku; Numa Numa Ptn; NORTHERN PROVINCE: Bisi Ptn.; Igora Ptn.; Mt Lamington; Popondetta; WESTERN PROVINCE: Oriomo Stn.; SOLOMON ISLANDS: Guadalcanal. Specimens are in AM, ANIC, BCRI, BMNH, BPBM, DPIF, PDPI, QDPI, QM, SAM, UMZ, UQIC, WADA, WAM, WARI.

Number of specimens collected by month: January, 38; February, 52; March, 93; April, 55; May, 82; June, 39; July, 36; August, 18; September, 25; October, 26; November, 66; December, 28.

Diagnosis

Length 6.5 (5.5-7.0) mm. Upper side pale brown. Elytra with 28 black spots, sometimes some spots connected or absent; elytral apex rounded.

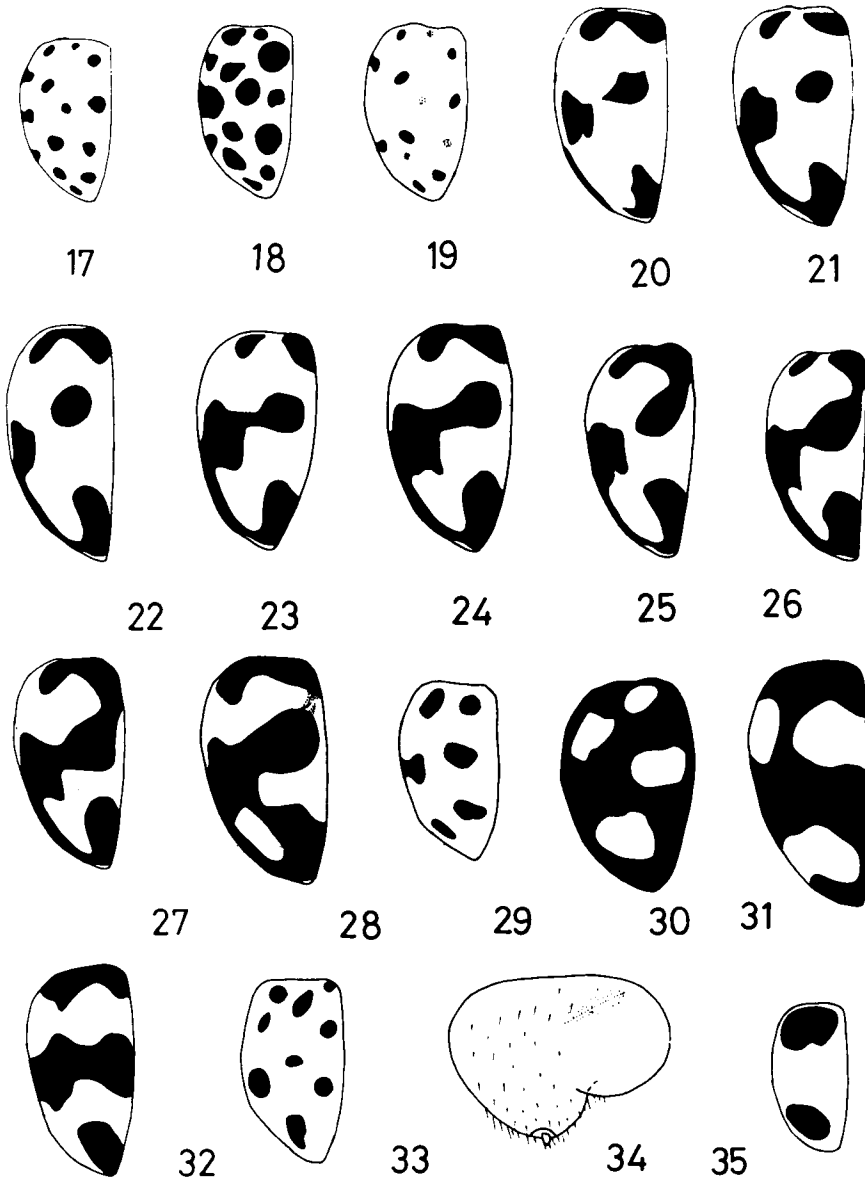
Variation

Pronotum variable from spotless to 3-4, 3-4 and 7, 1-4, 1-4 and 7, 1-6, or 1-7 black spots (see Fig. 1) often present; usually 3-4 or 3-4 and 7 united; usually spots increase in number and size in dark specimens. In extreme cases, in 2 dark specimens, pronotal pattern (i.e. 1, 3 + 4 + 7, 2, 5, 6) with extra dark pigment spreading from front- to post-central area. All 28 black elytral spots small in pale specimens (Fig. 17) or large in dark specimens (Fig. 18), some spots joined to margins. Spots approximately equally developed

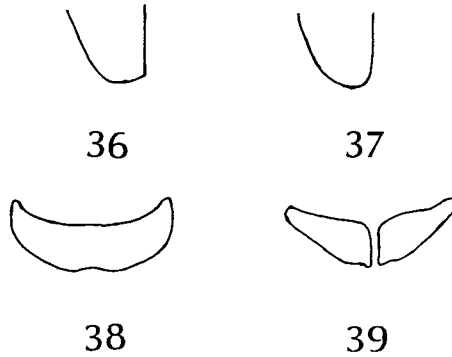
or variable in size. Sometimes 1 to 3 persistent spots and/or 1 or more non-persistent spots absent (Fig. 19); more spots missing in pale specimens. Two persistent spots (i.e. 3 and 5 or 3 and 4) and/or 2 or more non-persistent spots (i.e. *e* and *f*, *f* and *h* and/or *g* and *h*) often united in dark specimens. Persistent spot also may coalesce with non-persistent ones (i.e. 3 + 5, 4 + *e* + *g* + *h* and *e* + *f* in 1 specimen). Greatly varying sizes of individual spots, sometimes results in unequal number of spots on either side of pronotum or on either elytron.

Genitalia

See descriptions and figures for *vigintioctopunctata* given by Dieke (1947) and Bielawski (1963), and for *cucurbitae* by Richards (1983), and comments under *H. vigintioctopunctata*.



FIGS 17-35—(17-32) *Henosepilachna* spp., left elytra of: (17-19) *H. cucurbitae*; (20-28) *H. mjoebergi*; (29) *H. boisduvali*; (30) *H. suffusa*; (31, 32) *H. guttatopustulata*; (33-35) *Epilachna* spp.: (33-34) *E. dawkinsi*: (33) left elytron; (34) female genital plate, ventral; (35) *E. galerucinoides*, left elytron.



FIGS 36-39—*Henosepilachna* spp.: (36) *H. vigintioctopunctata*, elytral apex with distinct angle; (37) *H. cucurbitae*, elytral apex rounded; (38) *H. vigintisexpunctata*, male visible abdominal sternite 6 not split; (39) *H. cucurbitae*, female visible abdominal sternite 6 split.

Distribution

Australia, Indonesia, New Caledonia, Papua New Guinea, Philippines, Samoa, Solomon Islands, Timor.

Comments

Mulsant (1850) redescribed *vigintisexpunctata* from material from Australia (Dejean Coll., including at least one type of *vigintisexpunctata*), New Guinea (Guérin Coll.) and Java (Buquet Coll.). Even though Richards (1983) examined the types of *vigintisexpunctata* and accepted it as a true species, she placed Mulsant's re-description as a synonym of *vigintioctopunctata pardalis*. The Guérin coccinellid collection was acquired by Crotch and deposited in UMZ. I recently examined a specimen labelled "N. Guin. Guer." which was placed under *vigintisexpunctata*, although it is not clear whether it was determined by Mulsant (Dr W. A. Foster, pers. comm.). It is *cucurbitae* according to its male genitalia. Thus *vigintisexpunctata sensu* Mulsant (1850) appears to refer to *cucurbitae* at least in part.

This species can be distinguished from *vigintioctopunctata* or *vigintisexpunctata* by the rounded elytral apex and genitalic character (see comments under *vigintioctopunctata*).

From the hosts on the labels of specimens examined, *cucurbitae* is recorded on Cucurbitaceae more frequently than on Solanaceae, while the previous two species are recorded on Solanaceae more frequently than Cucurbitaceae.

Henosepilachna mjoebergi (Weise), comb.n.

Epilachna mjoebergi Weise, 1923: 131; Korschefsky, 1931: 33; Dieke, 1947: 92-93; Bielawski, 1963: 361-364.

Types—*Epilachna mjoebergi*: QUEENSLAND: Malanda, *holotype* (Naturhistoriska Riksmuseet, Stockholm), not examined.

Material examined—AUSTRALIA, 58 specimens: QUEENSLAND: Atherton; Cairns area; Clump Point; Eubenangee; East Evelyn; Gadgarra; Kuranda; Malanda: Mulgrave R.; Rockingham Bay; South Johnstone; Wongabel. NEW GUINEA: No further data. Specimens are in AM, ANIC, BCRI, BPBM, MM, MV, QDPI, QM, SAM, UQIC, USNM.

Number of specimens collected by month: March, 2; April, 1; June, 2; September, 3; October, 6.

Diagnosis

Length 7.5 (6.9-7.9) mm. Upper side reddish brown, sides of pronotum yellowish. Each elytron with 5 black persistent spots (spot 6 absent), always some or all spots coalescing or connecting; elytral apex rounded.

Variation

Except spot 3 never touching suture, all 5 elytral spots with tendency to enlarge, touching

margins/suture, and coalescing (i.e. 1 + 2, 3, 4, 5; 1, 2, 3, 4 + 5; 1 + 2, 3, 4 + 5; 1, 2, 3 + 4 + 5; 1 + 2, 3 + 4 + 5; 1 + 2 + 3, 4 + 5; 2, 1 + 3 + 4 + 5; 1 + 2 + 3 + 4 + 5; or 2 + 1, 3 + 4 + 5 with spots 1 and 3 partly united and spots 4 and 5 united dorsally as well as along elytral margin, as in Figs 20-28, respectively).

Genitalia

See descriptions and figures given by Dieke (1947) and Bielawski (1963).

Distribution

Australia, New Guinea.

Comments

This species and *H. urvillei* (Montrouzier) are similar in appearance with five black persistent spots on each elytron. However, in this species the spot 6 is absent, but the spot 3 is absent in *urvillei*.

Henosepilachna boisduvali (Mulsant)

Epilachna boisduvali Mulsant, 1850: 765; Crotch, 1874: 86; Korschefsky, 1931: 32; Dieke, 1947: 79-80; Fürsch, 1959: 2.

Epilachna montrouzieri Fauvel, 1862: 57; Crotch, 1874: 89.

Epilachna montrouzieri var. *fijiensis* Crotch, 1874: 89.

Epilachna boisduvali ab. *fijiensis* Crotch: Korschefsky, 1931: 32.

Epilachna boisduvali fijiensis Crotch: Dieke, 1947: 81.

Epilachna boisduvali ab. *montrouzieri* Fauvel: Korschefsky, 1931: 32.

Epilachna boisduvali boisduvali Mulsant: Bielawski, 1959: 149; 1963: 382-386.

Epilachna boisduvali samoana Dieke, 1947: 81.

Henosepilachna boisduvali (Mulsant): Li and Cook, 1961: 47-48; Bielawski, 1965a: 538, 551-552; Sasaji, 1971: 307; Hoang, 1977: 133.

Types—*Epilachna boisduvali*: AUSTRALIA(?): type (MNHN), not examined.

Material examined—AUSTRALIA, 13 specimens: QUEENSLAND: Atherton; Cairns area; Eubenangee; Malanda. Specimens are in ANIC, BPBM, MV, QDPI, QM, SAM.

Number of specimens collected by month: March, 1; November, 1.

Diagnosis

Length 6.9 (6.2-7.7) mm. Upper side reddish brown. Pronotum with black central spot variable in size. Each elytron with 6 black persistent spots about equally developed (Fig. 29); elytral apex rounded.

Genitalia

See descriptions and figures given by Dieke (1947), Li and Cook (1961), and Bielawski (1963).

Distribution

Australia, Fiji, Flores, Loyalty Islands, New Caledonia, New Hebrides, northern Vietnam, Philippines, Ryukyu Islands, Samoa, Sumatra, Taiwan, Timor.

Comments

This species is similar to the forms of *H. vigintioctopunctata* or *H. vigintisexpunctata* with 12 elytral black spots. It can be distinguished from either of these by no coalescence of any spots and the elytral apex rounded.

Henosepilachna urvillei (Montrouzier), comb.n.

Epilachna urvillei Montrouzier, 1861: 305; Crotch, 1874: 88; Bielawski, 1963: 386-390.

Epilachna moultoni Crotch, 1874: 89; Korschefsky, 1931: 33.

Epilachna moultoni moultoni Crotch: Dieke, 1947: 82-83.

Epilachna moultoni manusensis Korschefsky, 1933: 236; Dieke, 1947: 82.

Epilachna boisduvali ab. *urvillei* Montrouzier: Korschefsky, 1931: 32.

Type(s)—*Epilachna urvillei*: type(s) from Lifu (Loyalty Islands); depository unknown.

Material examined—AUSTRALIA: 1 ♀, "Australia coll. Solman", in PANI. PAPUA NEW GUINEA: 1 ♂, Keravat, East New Britain Province, August 1955, J. L. Gressitt; in PANI.

Diagnosis

Length 7.4 mm. Upper side yellowish brown, pronotum spotless. Each elytron with 5 persistent black spots; spots 1 and 2 uniting and closer to suture/basal margin than lateral margin; spot 3 absent; spots 4 and 5 on lateral margin and suture respectively; spot 6 closer to lateral margin than suture. Elytral apex rounded. See descriptions and figures of genitalia given by Bielawski (1963).

Distribution

Australia, Loyalty Islands, New Caledonia, New Guinea, Solomon Islands.

Comments

Bielawski (1963) recorded *urvillei* from Australia on the basis of one specimen (see material examined). It has not been reported again from Australia. The female genitalia of the Australian specimen agree with those in Bielawski (1963).

This species can be distinguished from *H. mjoebergi* by the absence of the spot 3 (see comments under *mjoebergi*).

Henosepilachna suffusa (Crotch), comb.n.

Epilachna suffusa Crotch, 1874: 78; Korschefsky, 1931: 33; Bielawski, 1963: 390-394.

Epilachna terraereginae Blackburn, 1895: 237. Syn.n.

Epilachna guttatopustulata ab. *terraereginae* Blackburn: Korschefsky, 1931: 33.

Types—*Epilachna suffusa*: AUSTRALIA: holotype (UMZ), examined. *Epilachna terraereginae*: QUEENSLAND: type(s), depository unknown.

Other material examined—AUSTRALIA, 19 specimens: QUEENSLAND: Bowen; Cairns area; Dunk I.; Mackay. Specimens are in ANIC, MM, MV, QDPI, QM, SAM.

Number of specimens collected by month: August, 1.

Diagnosis

Length 7.5 (7.2-7.8) mm. Upper side reddish black or brownish black, sides of prothorax yellowish. Each elytron with 4 reddish or brown spots, some of them coalescing; 1st spot situated obliquely near scutellum; 2nd close to lateral margin and behind callus; 3rd at ½ length of elytron and close to suture; and 4th transversely at apex and slightly closer to lateral margin than suture (Fig. 30). Elytral apex rounded.

Variation

Elytral colour pattern variable, ranging from specimens with 4 elytral spots increasingly united (i.e. 1 + 2, 3 + 4, 1 + 2 + 3, or 1 + 2 and 3 + 4) and/or elytral black pigment gradually reduced and elytral spots obscured, to rare specimens with entire elytron dark reddish brown, orange-brown or orange.

Genitalia

See descriptions and figures given by Bielawski (1963).

Distribution

Australia.

Comments

In a few specimens previously identified as *terraereginae*, the elytra are dark reddish brown, orange-brown, or orange and agree with the original description of *terraereginae* given by Blackburn (1895), but their genitalia are identical to those of *suffusa*. So far I have not examined any of the specimens of *H. guttatopustulata* having the uniform colour described above. Therefore *terraereginae* must be regarded as a form of *suffusa*.

Henosepilachna guttatopustulata (Fabricius)

Coccinella guttatopustulata Fabricius, 1775: 87.

Coccinella tricincta Montrouzier, 1855: 76.

Epilachna pandora Mulsant, 1853: 237.

Epilachna guttatopustulata (Fabricius): Mulsant, 1850: 716; Crotch, 1874: 77; Froggatt, 1902: 4-5; Weise, 1923: 131; Korschefsky, 1931: 32; Dieke, 1947: 104; Bielawski, 1963: 406-411.

Epilachna guttatopustulata var. *tricincta* (Montrouzier): Crotch, 1874: 78.

Epilachna guttatopustulata tricincta (Montrouzier): Korschefsky, 1931: 33; Dieke, 1947: 106.

Epilachna guttatopustulata var. or ab. *tasmanica* Crotch, 1874: 78; Korschefsky, 1931: 33.
Epilachna guttatopustulata tasmanica Crotch: Dieke, 1947: 106.
Epilachna guttatopustulata ab. *pandora* Mulsant: Korschefsky, 1931: 33.
Henosepilachna guttatopustulata (Fabricius): Bielawski, 1965c: 230.

Types—*Coccinella guttatopustulata* Fabricius type from Australia (BMNH); not examined, see comments under this species.

Epilachna guttatopustulata var. *tasmanica* Crotch type ♀, labelled "type", "var. tasmanica" (designated as *lectotype* by Gordon in 1987) (UMZ); examined.

Other material examined—AUSTRALIA, 273 specimens: NEW SOUTH WALES: Ballina; Bath; Bullma; Richmond R.; Byron Bay; 7 Mile Beach nr Byron Bay; Clarence; Dorrigo; Grafton; Lismore; Mt Warning; Richmond R.; Sydney; Tweed R.; Uki; Wollongbar; nr Wyrallah. NORTHERN TERRITORY: No further data. QUEENSLAND: Ayr; Blackall Range; Brisbane; Bulburin State Forest via Many Peaks; Burleigh Heads; Cairns area; Canungra; Charters Towers; Coen; Coopers Ck, 13 km N. Daintree R.; Daintree; Deception Bay; Elimbah; Eubenangee; Gap Ck; N. Bloomfield R.; Gatton; Gayndah; Gympie; Imbil; Innisfail; Pinjin Hill nr Innisfail; Julatten; Kairi; Walli Ck nr Kenilworth; Kingaroy; Kuranda; Lamington National Park; Lever's Plateau; Lower Gregory, Proserpine; Mabuiag I., Torres Strait; McIvor R., N. of Cooktown; Mackay; Malanda; Mary Cairncross Park, nr Maleny; Mapleton; Mermaid Beach; Moffat Beach; Montville; Moreton Bay; Mt Beerwah; Mt Glorious; Mt Lindesay; Mt Nebo; Mt Tamborine; Mt Warning; Mt Webb National Park, 50 km N. Cooktown; Murgon; Nambour; Nanango area; South Johnstone; Tully; Wide Bay; Woodford. IRIAN JAYA: No further data. PAPUA NEW GUINEA: CENTRAL PROVINCE: Port Moresby; MILNE BAY PROVINCE: Misima I.; MOROBE PROVINCE: Finschhafen; NORTHERN PROVINCE: Mt Lamington. SOLOMON ISLANDS: Kolobangara. Specimens are in AM, ANIC, BCRI, BMNH, BPBM, MM, QDPI, QM, SAM, UMZ, UQIC, USNM, VDA.

Number of specimens collected by month: January, 11; February, 12; March, 5; April, 7; May, 8; June, 7; July, 7; August, 6; September, 10; October, 15; November, 7; December, 83.

Diagnosis

Length 7.8 (7.2-8.6) mm. Upper side black, sides of pronotum yellow or yellowish brown. Each elytron with 3 spots, 2 subbasal and 1 subapical; 1st spot on or close to suture reddish brown; 2nd on lateral margin yellow or yellowish brown, and 3rd subapical, close to suture and on lateral margin reddish brown (Fig. 31). Elytral apex rounded.

Variation

Rarely 2 subbasal spots narrowly connected. One (colour form: *tricincta*) from Maubiag Island, Torres Strait, with same colour pattern as majority of specimens examined from New Guinea: pronotal black pigment faintly indicated, 2 subbasal spots united and subapical one enlarged/extended to form 2 reddish brown fasciae respectively. One (colour form: *tasmanica*) with subbasal spots united similar to that of *tricincta*, subapical spot enlarged/extended and deeply angulated, and apical black pigment enlarged anteriorly (Fig. 32).

Genitalia

See descriptions and figures given by Dieke (1947) and Bielawski (1963).

Distribution

Australia, Bismarck Archipelago, New Guinea, New Hebrides, Solomon Islands.

Comments

According to Dr R. D. Pope (pers. comm.), a single ♀ specimen labelled *Henosepilachna guttatopustulata* from Banks collection for Fabricius' material in BMNH agrees with the "typical" form illustrated by Dieke (1947). It is no doubt that the specimen is the one originally looked at by Fabricius during his visit to Britain in the early 1770s. There is no reason to regard it other than the "type".

I have examined the *lectotype* ♀ of variety *tasmanica* from the Crotch's collection in UMZ. Unfortunately there is no locality, date of collection and collector's name on the labels. According to Dr W. A. Foster (pers. comm.), this is the only specimen labelled var. *tasmanica* and is almost certainly the original specimen from Tasmania collected by Deyrolle.

As mentioned, all three colour forms of this species, viz. *guttatopustulata*, *tricincta* and *tasmanica*, occur in Australia. Such maculation differences of these forms are very common in *Henosepilachna*. As there are no geographical separation or genitalic differences between these forms or subspecies, they must be regarded as forms of a single, highly variable and polymorphic species.

Epilachna Chevrolat

Epilachna Chevrolat, 1834: 436; Li and Cook, 1961: 51; Fürsch, 1963: 51; 1964: 182; Bielawski, 1965b: 213; Sasaji, 1971: 307; Gordon, 1975: 17, 37; Pan and Mao, 1977: 324. *Type species Coccinella borealis* Fabricius, by subsequent destination (Hope, 1840: 157) *lectotype* ♀ (here designated) (ZMUC), see below. *Solanophila* Weise, 1898: 99, 101. *Afissa* Dieke, 1947: 113 (synonymised by Li and Cook, 1961: 51).

Diagnosis

Tarsal claws bifid without basal tooth. Sixth abdominal sternite of female not split longitudinally.

Comments

Recently three syntypes of *E. borealis* (F.) from ZMUC have been examined. One female syntype in good condition is here selected and designated as lectotype; one of the paralectotypes lacks both head and prothorax, and the other lacks the abdomen. The sixth abdominal sternite of the lectotype which is entire (undivided) with a median, longitudinal, slightly sclerotised area (often called a longitudinal suture) as described for *borealis* by Li and Cook (1961) and Gordon (1975).

Epilachna was first proposed in 1836 by Chevrolat in Dejean's Catalogue. He defined the genus by publishing a list of species belonging to the genus (among these species *E. borealis* (F.) was the first named species). As Chevrolat fulfilled all the requirements of the International Code of Zoological Nomenclature, he is regarded as the author of the genus *Epilachna* by most recent authors. Richards (1983) ignored Article 50 of the Code and recognised Dejean as the author of the genus.

Epilachna dawkinsi, sp.n.

Type—SOUTH AUSTRALIA: *holotype* ♀ Reedy Creek, January-February 1962, J. C. Dawkins; (SAM).

Description

Length 4.3 mm. Upper side reddish brown. Pronotum spotless with fine punctures. Each elytron with 9 black spots, no spots on suture or lateral margin except spot 1, smallest, on base and scutellum (Fig. 33); with coarse and fine punctures; pubescence yellowish throughout; apical angle rounded. Ventral side concolorous with dorsum except tip of mandibles black, appendages, metasternum and mesal part of abdomen all dark reddish brown. Tarsal claws bifid, inner claw wider than outer claw, inner claws apically in contact with each other. Abdominal lines subcomplete, rounded, reaching to ca ¼ distance from apical margin to base of mesal part of 1st abdominal sternite. In ♀, hind margin of 5th abdominal sternite truncated; 6th sternite broadly convex.

Female Genitalia

Genital plates (Fig. 34) 0.28 mm long, greatest width 0.34 mm; each plate with large, concave area on inner edge extending to ca ½ width of plate. Hind margin of 10th abdominal tergite emarginate.

Distribution

Known only from type locality.

Comments

This species is named after the collector, J. C. Dawkins. The holotype is the only known specimen. Efforts to collect further specimens from the type locality by entomologists of the South Australian Department of Agriculture have been unsuccessful.

Epilachna galerucinoides Korschefsky

Epilachna (Solanophila) galerucinoides Korschefsky, 1934: 107-108.
Afissa galerucinoides (Korschefsky): Bielawski, 1959: 153-154; 1962: 193.
Epilachna galerucinoides Korschefsky: Hoang, 1977: 134.

Types—*Epilachna galerucinoides*: *holotype* from Flores (Universität Humboldt, Berlin); not examined; *paratype* ♂ from "Burnside, N.A." ("Nord-Australien ca 200 km hinter Darwin") (NM); examined.

Diagnosis

Length 5.5 mm. Upper side pale reddish brown, pronotum pale yellow. Each elytron with 2 large

black spots, 1 basal and 1 subapical (Fig. 35); elytral apex rounded. See descriptions and figures of the male and female genitalia given by Bielawski (1959).

Distribution

Australia, Flores, northern Vietnam, Sumba.

Comments

E. galerucinoides was described by Korschefsky (1934) on the basis of two specimens, one from Flores and one from North Australia. It was re-described by Bielawski (1959) from Sumba and Flores, mentioned by Bielawski (1962) from Flores again and by Hoang (1977) from northern Vietnam. Since Korschefsky (1934), this species has not been reported again from Australia. Both Dieke (1947) and Bielawski (1963) overlooked it. Although I examined about 1,500 Australian Epilachninae from institutions and museums all over the world, no further specimens of *E. galerucinoides* were seen. Attempts to collect further specimens at Burnside (ca 120 km SSE of Darwin) in early May, 1978 and mid April 1979 were unsuccessful (only some *H. cucurbitae* were collected on cucurbits). However, I examined and dissected the paratype ♂ and its male genitalia agree with the re-description of Bielawski (1959).

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