KARL V. KROMBEIN

A Revision of the Melanesian Wasps of the Genus Cerceris Latreille (Hymenoptera: Sphecidae)

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ABSTRACT

Krombein, Karl V. A Revision of the Melanesian Wasps of the Genus *Cerceris* Latreille (Hymenoptera: Sphecidae). *Smithsonian Contributions to Zoology*, 22:1-36. 1969.—In the Melanesian area, wasps of the sphecid genus *Cerceris* Latreille are known only from New Guinea and its offshore islands, the Bismarck Archipelago and Solomon Islands. Keys, descriptions, and illustrations are presented in this revisionary study of the following taxa: ♀ ♂ *Cerceris pictiventris immolator* Smith, 1864; ♀ *C. cristovalensis*, new species; ♀ *C. cyclops*, new species; ♀ *C. papuensis*, new species; ♀ *C. misoolensis*, new species; ♀ ♂ *C. karimuiensis*, new species; ♂ *C. brandti*, new species; ♀ ♂ *C. millironi millironi*, new subspecies; ♀ *C. millironi tulagiensis*, new subspecies; ♂ *C. millironi malaitensis*, new subspecies; ♀ ♂ *C. reicula*, new species; ♀ ♂ *C. minuscula sculleniana*, new subspecies; ♀ *C. minuscula stanleyensis*, new subspecies; ♂ *C. minuscula korovensis*, new subspecies; ♀ *C. vechti*, new species; ♀ ♂ *C. venusta oceanica* Brèthes, 1920, new status (=*C. insulicola* Tsuneki, 1968, new synonymy); ♀ ♂ *C. venusta keiensis* Strand, 1911, new status; ♀ ♂ *C. venusta atrescens*, new subspecies; ♀ *C. mordax*, new species; ♀ *C. toxopeusi*, new species; ♀ *C. vellensis vellensis*, new subspecies; ♀ ♂ *C. vellensis obrieni*, new subspecies; ♀ ♂ *C. vellensis fordi*, new subspecies; ♀ *C. vellensis segiensis*, new subspecies; ♀ ♂ *C. bougainvillensis solomonis*, new subspecies; ♀ ♂ *C. bougainvillensis lavellensis*, new subspecies; ♀ ♂ *C. bougainvillensis novogeorgica*, new subspecies; and *C. bougainvillensis bougainvillensis* Tsuneki, 1968, new status.

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A Revision of the Melanesian Wasps of the Genus Cerceris Latreille (Hymenoptera: Sphecidae)

The Melanesian representatives of the cosmopolitan wasp genus *Cerceris* have received virtually no attention until this time. Smith (1864) described *immolator* from a single male collected by Wallace on the island of Waigeu, Cameron (1906) described *papuana* from a unique female collected at Manokwari, West New Guinea, by one of the early Dutch expeditions, Strand (1911) described *venusta* var. *keiensis* from a single female from the Kei Islands, Brèthes (1920) described *oceanica* from Yule Island, and Tsuneki (1968a) described *bougainvillensis* from the Solomon Islands. In a review of the Javan species van der Vecht (1964) synonymized *papuana* under *immolator,* so that only four valid Melanesian taxa were recognized at the time of my study.

Prior to World War II, Miss L. Evelyn Cheesman, working at a number of localities in New Guinea, and H. T. Pagden in the southern Solomon Islands, made some very significant collections. During the war a number of American entomologists, among them D. E. Beck, W. G. Bodenstein, G. E. Bohart, J. G. Franclemont, D. G. Hall, P. D. Hurd, Jr., K. V. Krombein, U. N. Lanham and H. E. Milliron, collected specimens at various localities in New Guinea and the Solomon Islands. Since the war, J. L. Gressitt and a number of associates, W. W. Brandt, E. J. Ford, Jr., T. C. Maa, C. D. Michener, C. W. O'Brien, L. W. Quate, and J. and M. Sedlacek, working under the auspices of the Bernice P. Bishop Museum, Honolulu, have done some spendid collecting in many areas of New Guinea, the Bismarck Archipelago, and Solomon Islands. The accumulated materials from these collecting efforts, together with a few specimens from other sources, were sufficient to permit the present preliminary revisionary effort treating some 28 Melanesian taxa, representing 16 different species.

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Distribution and Relationships

Within the Melanesian area wasps of the genus *Cerceris* are known from New Guinea and such offshore islands or island groups as Waigeu, Misool, Kei, Aru, and Schouten, from both New Britain and New Ireland in the Bismarck Archipelago, and from all of the principal Solomon Islands with the exception of Choiseul and Rennell. Their occurrence on the latter two islands may be established when more thorough collecting has been done; unquestionably, they must be present on Choiseul. The genus does not occur in New Caledonia, New Hebrides, or Fiji Islands; the wasp fauna of these island groups has been investigated quite thoroughly.

The Melanesian taxa and their distribution within the area are as follows:

1. *pictiventris immolator* Smith—Waigeu, Schouten Islands, throughout New Guinea, New Britain, New Ireland, Bougainville, Gizo, Santa Ysabel, Guadalcanal, and Florida. Typical *pictiventris* Dahlbom occurs in Java, Sumatra, and Borneo;

other subspecies occur in the northern Moluccas, India, and Formosa.

2. *cristovalensis,* new species—San Cristoval in the Solomons.
3. *cyclops,* new species—West New Guinea (Cyclops Mountains).
4. *papuensis,* new species—West New Guinea (Manokwari).
5. *misoolensis,* new species—Misool Island.
6. *karimuiensis,* new species—northeastern New Guinea (Karimui).
7. *brandti,* new species—New Ireland.
8. *millironi,* new species—Solomon Islands.
   - 8a. *millironi millironi,* new subspecies—Guadalcanal, and possibly Santa Ysabel.
   - 8b. *millironi tulagiensis,* new subspecies—Florida.
   - 8c. *millironi malaitensis,* new subspecies—Malaita.
9. *reicula,* new species—New Guinea generally.
10. *minuscula* Turner—the typical subspecies occurs in Australia.
    - 10a. *minuscula sculleniana,* new subspecies—general in New Guinea, Nusa Island, New Ireland, Buka Island in the Solomons.
    - 10b. *minuscula stanleyensis,* new subspecies—Owen Stanley Mountains in Papua.
    - 10c. *minuscula korovensis,* new subspecies—Shortland Island in the Solomons.
11. *vechti,* new species—northeastern New Guinea, Papua.
12. *venusta* Smith—the typical subspecies occurs in Queensland.
    - 12a. *venusta oceanica* Brèthes (=*insulicola* Tsuneki)—New Guinea east of 146°, Prince of Wales Island.
    - 12b. *venusta keiensis* Strand, new status—Kei and Aru Islands.
    - 12c. *venusta atrescens,* new subspecies—New Guinea west of 146°.
13. *mordax,* new species—Papua (Port Moresby area).
14. *toxopeusi,* new species—West New Guinea (Hollandia).
15. *vellensis,* new species—occurs only in Solomon Islands.
    - 15a. *vellensis vellensis,* new subspecies—Vella Lavella Island.
    - 15b. *vellensis obrieni,* new subspecies—Santa Ysabel Island.
    - 15c. *vellensis fordi,* new subspecies—Bougainville and Buka Islands.
    - 15d. *vellensis segiensis,* new subspecies—New Georgia.
16. *bougainvillensis* Tsuneki—Solomon Islands and New Ireland in Bismarck Archipelago.
    - 16a. *bougainvillensis solomonis,* new subspecies—Guadalcanal, Santa Ysabel.
    - 16b. *bougainvillensis lavellensis,* new subspecies—Vella Lavella and Gizo.
    - 16c. *bougainvillensis novogeorgica,* new subspecies—New Georgia.
    - 16d. *bougainvillensis bougainvillensis* Tsuneki—Bougainville and Buka Islands, New Ireland.

Of the taxa listed above, *pictiventris immolator* has its closest relatives in the Oriental region, whereas the several subspecies of *minuscula* and *venusta* have their closest relatives—the typical subspecies of each—in the Australian region. *C. vechti* is obviously rather closely related to *venusta,* as is *reicula* to *minuscula.*

Little can be said as to the affinities of the remaining eleven Melanesian species. They are quite distinct, however, from any of the species occurring in Australia, Java, or the Philippines. Material is not available from the Moluccas, Celebes, and Lesser Sunda Islands, but it appears rather likely that most, if not all, of these eleven species will prove to be autochthonous Melanesian elements.

Attention may be drawn to *vellensis* and *bougainvillensis* of the Solomon Islands, each of which is represented by four subspecies based chiefly on differences in the color pattern. In both species the distinctive color patterns are similar for each pair of subspecies occurring on the same island or group of islands. The darkest subspecies, *vellensis segiensis* and *bougainvillensis novogeorgica,* have the thorax and abdomen virtually or entirely black; they occur on New Georgia. Red markings have been more or less extensively developed in typical *vellensis* and *bougainvillensis lavellensis* from Vella Lavella and Gizo Islands in the New Georgia group. The subspecies with the most extensive yellow markings are *vellensis obrieni* and *bougainvillensis solomonis* from the southern Solomons; the former is known from Santa Ysabel only and the latter from Guadalcanal as well as Santa Ysabel. Two subspecies with somewhat less yellow than the preceding pair are found in the northern Solomons on Bougainville and Buka Islands; they are *vellensis fordi* and typical *bougainvillensis.*

Biology

Regrettably, virtually nothing is known of the nesting habits and prey preferences of the Melanesian *Cerceris*. It can be taken for granted that the Melanesian species are ground nesters, as are those whose nesting habits are known in other parts of the world. The type series of *bougainvillensis novogeorgica,* new subspecies, was collected by J. G. Franclemont on New Georgia in the Solomons in front of the nesting site, a "clay bank in deep jungle." Most species of *Cerceris* prefer to nest in horizontal or slightly sloping areas, although a few are known to begin their burrows in the vertical surface of sandbanks as does *boungainvillensis novogeorgica.*

The Old World species of *Cerceris* may be divided into a number of groups, one of which preys on small solitary bees and the others which prey on various kinds of beetles such as Curculionidae, Buprestidae, Chrysomelidae, and others. There is only one representative of the former group in the Melanesian area, *pictiventris immolator* Smith. Its specific prey preferences are unknown, but another subspecies, *pictiventris formosicola* Strand, preys on *Halictus* bees in Formosa according to Iwata (1939, pp. 173–174). The remaining eleven Melanesian species belong to groups whose prey preferences are likely to be coleopterous. The holotype of *millironi tulagiensis,* new subspecies, was collected with its prey on Florida Island in the Solomons by H. T. Pagden according to a label on the wasp, but no notes are available as to the identity of the prey. *Cerceris venusta* Smith is known from four subspecies, three from New Guinea, Prince of Wales Island, Kei and Aru Islands, and the typical subspecies from Queensland, Australia; a female of the last subspecies has been taken with its scarabaeid beetle prey, *Deuterocaulobius maechidioides* MacLeay.

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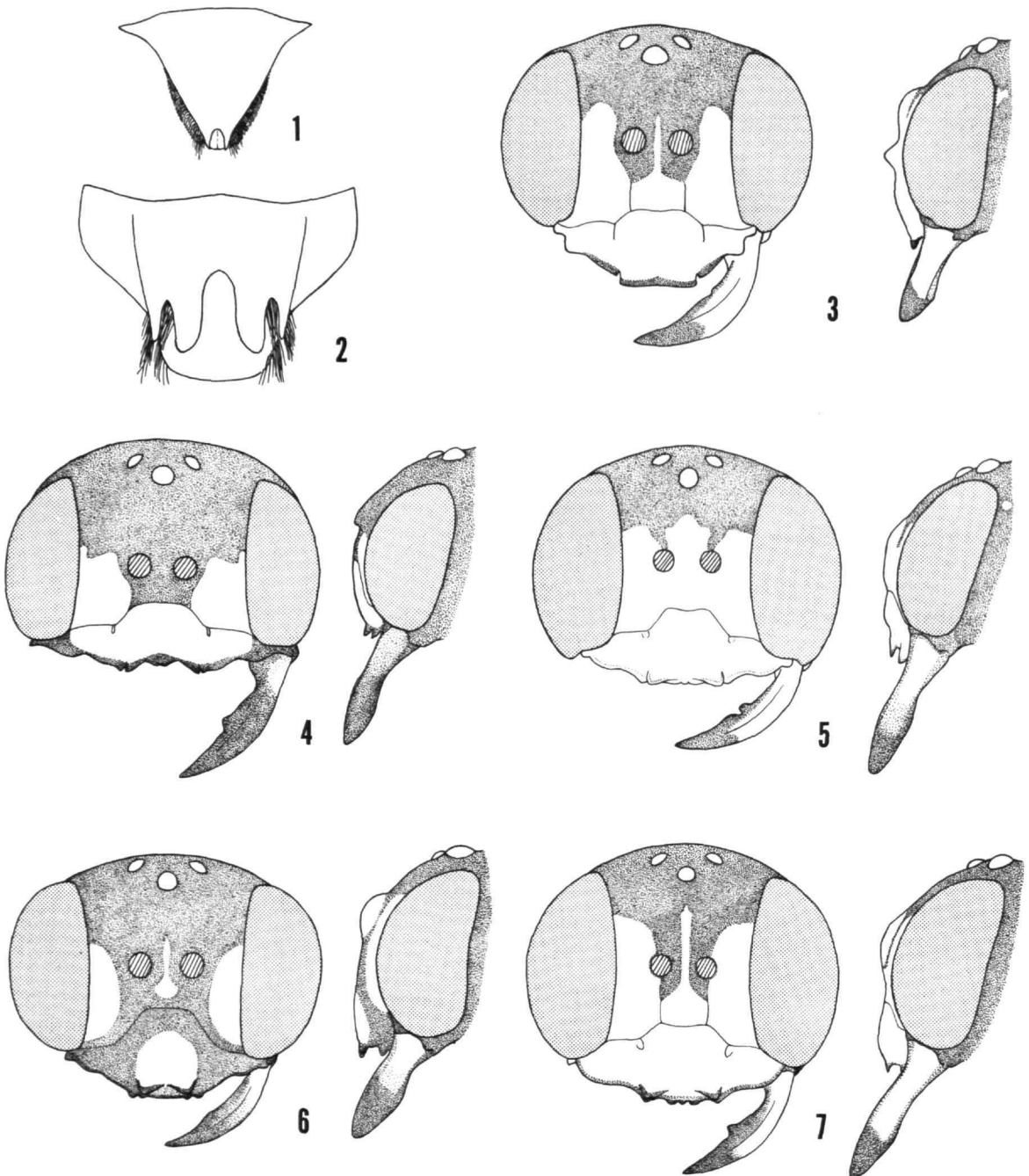
Key to the Melanesian *Cerceris*

(Females are unknown in *brandti*, new species, *millironi malaitensis*, new subspecies, and *minuscula korovensis*, new subspecies; males are unknown in *cristovalensis*, new species, *cyclops*, new species, *papuensis*, new species, *misoolensis*, new species, *millironi tulagiensis*, new subspecies, *minuscula stanleyensis*, new subspecies, *vechti*, new species, *mordax*, new species, *toxopeusi*, new species, *vellensis vellensis*, new subspecies, and *vellensis segiensis*, new subspecies.)

1. Females 2
   Males 26



FIGURES 1–7.—1, Female hypopygium, *C. pictiventris immolator* Smith; Nadzab, New Guinea. 2, Female hypopygium, *C. bougainvillensis solomonis,* new subspecies; holotype, Tenaru River, Guadalcanal. The female head, with frontal view at left and profile at right are shown in FIGURES. 3–7. 3, *C. pictiventris immolator;* Cyclops Mountain, West New Guinea. 4, *C. cristovalensis,* new species; holotype, San Cristoval. 5, *C. cyclops,* new species; holotype, Cyclops Mountains, West New Guinea. 6, *C. papuensis,* new species; holotype, Manokwari, West New Guinea. 7, *C. misoolensis,* new species; holotype, Misool Island.

2. Supraclypeal area raised into a strong tubercle between base of clypeus and interantennal lamella (Figure 3); hind coxa strongly carinate beneath along inner margin; hypopygium (Figure 1) without a tooth along lateral margin, with only a pair of apical teeth separated by a U-shaped emargination; 2nd sternum at base with a raised, flat, semicircular area which is abruptly declivous posteriorly; clypeus without a discal process; hind tibia on outer surface with 6 serrations; New Guinea, Bismarcks, Solomons . . . 1. **pictiventris immolator** Smith

Supraclypeal area flat or very gently convex; hind coxa not carinate beneath; hypopygium (Figure 2) with a pair of apical teeth separated by a U-shaped emargination and the lateral margin on each side with a smaller tooth, the latter occasionally quite reduced; 2nd sternum flat, depressed or only slightly raised at base, but in the last case not abruptly declivous posteriorly; clypeus with a discal process 3

3. Clypeal process low and transverse, distinctly broader than long (Figures 4–13); inner eye margins not convergent above except slightly so in *millironi* and more strongly so in *venusta* and *vechti*, the interocular distances across posterior ocelli and at intersection of eye and base of clypeus subequal; hind tibia with 6 or fewer serrations except occasionally 7 in *vechti* . . . 4

Clypeal process narrower and erect, usually noticeably as long as broad, or longer (Figures 14–19); inner eye margins convergent above except in *mordax*, the interocular distance across posterior ocelli less than at intersection of eye and base of clypeus; hind tibia with 7 or more serrations. 17

4. Clypeal process consisting of a pair of small, separated, acutely angled laminae (Figures 4–8); hind tibia with 4 or 5 serrations 5

Clypeal process not divided, the apical edge forming a continuous lamina (Figures 9–13); enclosure of propodeum punctate, rugae, if present, on extreme base only; hind tibia with 6 or 7 serrations 9

5. Propodeal enclosure delicately shagreened; dorsum of thorax and abdomen with very sparse, shallow punctation; 1st abdominal segment very slender, twice as long as wide; clypeal margin with a pair of widely separated teeth adjacent to lateral edge of clypeal process (Figure 4); San Cristoval . . . . . 2. **cristovalensis**, new species

Propodeal enclosure rugose or rugosopunctate, obliquely so on anterior half, arcuately so on posterior half; dorsum of thorax and abdomen with deep, subcontiguous to contiguous punctures; 1st abdominal segment stockier, width and length subequal; clypeal margin with 4 or 5 relatively close teeth 6

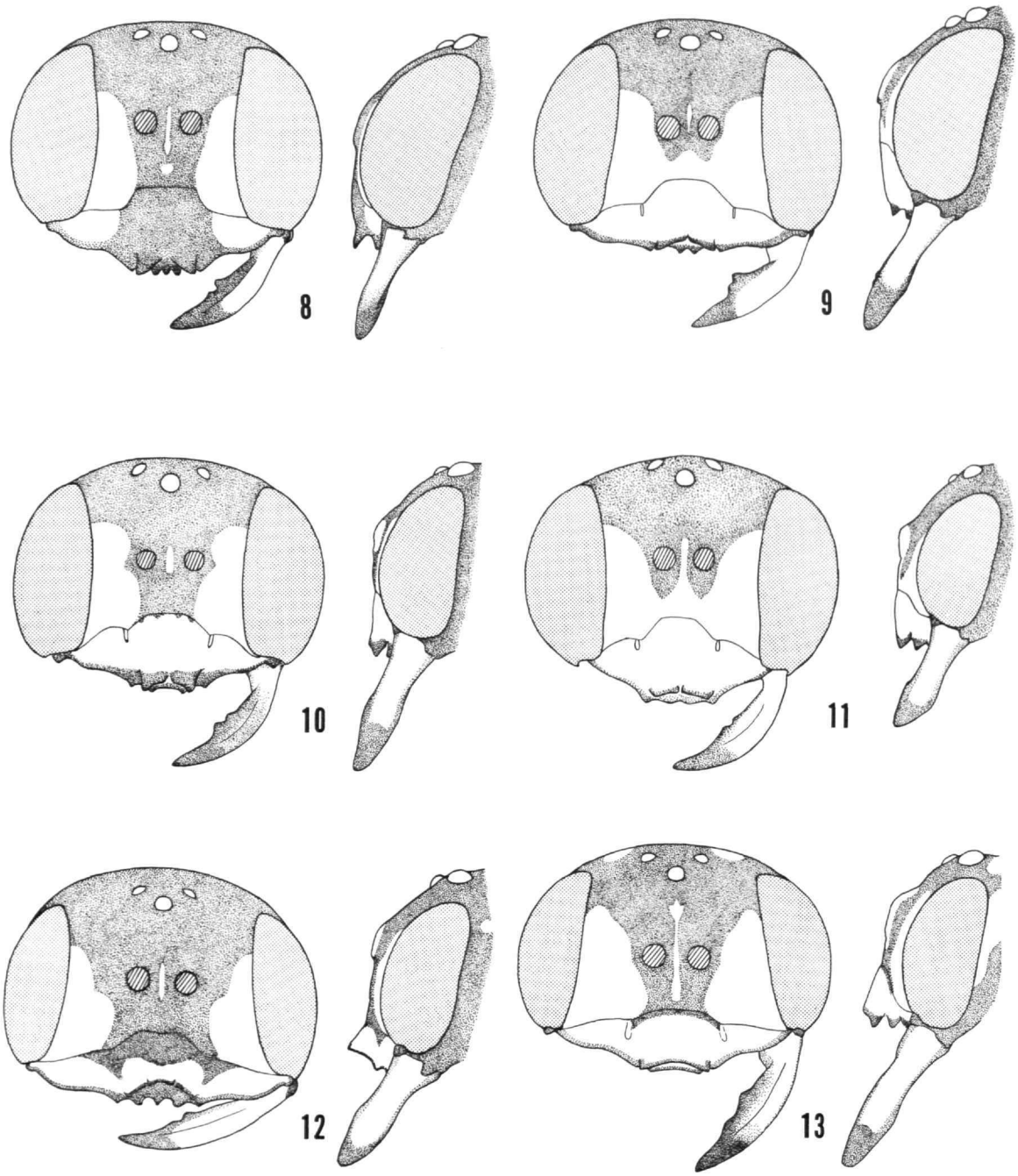
6. Black with more extensive yellow markings; the scutellum, postscutellum, and propodeum spotted with yellow; propodeal enclosure rugosopunctate; inner mandibular margin with 2 teeth in middle; apical margin of clypeus with 5 teeth, the median tooth and outer pair small and blunt, the intermediate pair broader and rounded (Figure 5); West New Guinea (Hollandia) . . . . . 3. **cyclops**, new species

Black with less extensive yellow or ivory markings; scutellum always immaculate, propodeum immaculate except in *karimuiensis*; propodeal enclosure rugose only 7

7. Propodeal enclosure irregularly rugose; pale markings yellow, tergum 1 with a tiny median spot near apex, terga 2 and 3 almost entirely yellow, and tergum 5 with a relatively broad apical band; inner mandibular margin with a single median tooth; apical margin of clypeus with 4 small blunt teeth, the inner pair separated by about the width of the clypeal process (Figure 6); West New Guinea (Vogelkop) . . . . . 4. **papuensis**, new species

Propodeal enclosure regularly rugose, obliquely so at base, arcuately so at apex; pale markings ivory, terga 2 to 5 with only narrow apical bands or paired posterolateral spots; apical margin of clypeus with 5 small, narrow, blunt teeth, the outer pair more separated than the inner 3 . 8

8. Clypeus entirely pale including the process, the edges of which are reddish, the laminae or process more widely separated (Figure 7); propodeum black; 1st tergum with small posterolateral pale spots, and 2nd with a pale apical band; 1st abdominal segment as long as broad; Misool Island . . . . . 5. **misoolensis**, new species



FIGURES 8–13.—Female head, frontal view at left, profile at right. 8, *C. karimuiensis,* new species; holotype, Karimui, northeast New Guinea. 9, *C. millironi millironi,* new subspecies; holotype. Kiwi Creek, Guadalcanal. 10, *C. reicula,* new species; paratype, Wamena, West New Guinea. 11, *C. minuscula scullenianа,* new subspecies; paratype, Torricelli Mountains, northeast New Guinea. 12, *C. vechti,* new species; holotype, Karimui, northeast New Guinea. 13, *C. venusta oceanica* Brèthes; K. B. Mission, Milne Bay, New Guinea.

Clypeus pale only on lateral lobes, the entire process black, the laminae of process closer together (Figure 8); propodeum with a pair of small posterolateral spots; sides and apex of 1st tergum, and base and apex of 2nd pale; 1st abdominal segment 1.3 times as long as broad; northeast New Guinea (Karimui) . . . . . 6. **karimuiensis,** new species

9. Front (Figure 9) between fore ocellus and upper termination of interantennal prominence rugosopunctate, punctate only along eye margins; inner eye margins converging slightly above; 2nd sternum with a small semicircular depression at base; Solomons . . (*millironi*) 10

Front contiguously punctate, not rugose; inner eye margins not converging above; 2nd sternum without basal depression 11

10. Yellow maculations more extensive, including paired spots on pronotum, band on scutellum usually, paired spots on propodeum, and apical bands on 3rd to 5th terga; abdominal punctation sparser, many of the larger punctures on terga separated by the width of a puncture or more; Guadalcanal, Santa Ysabel (?) . . 8a. **millironi millironi,** new subspecies

Yellow maculations less extensive, lacking on scutellum and propodeum, and usually only small lateral spots present on 3rd to 5th terga; abdominal punctation somewhat denser, many of the larger punctures on terga separated by half the width of a puncture; Florida . . . . . 8b. **millironi tulagiensis,** new subspecies

11. Inner eye margins not converging above nor below (Figures 10–11), the interocular distances across posterior ocelli and at base of clypeus subequal; head narrower, the greatest width 1.3 times the median height; head above immaculate 12

Inner eye margins distinctly converging above (Figures 12–13), the interocular distance across posterior ocelli 0.8–0.9 times that distance at intersection of eye and base of clypeus; head broader, at least 1.4 times its median height (apex of clypeus to posterior ocelli); head above with 2 to 4 yellow spots 14

12. Legs red and yellow or red, black, and yellow; propodeal enclosure dull, the punctures larger; punctation of thorax and abdomen coarser; New Guinea . . . . . 9. **reicula,** new species

Legs black and yellow; propodeal enclosure shiny and micropunctate; punctation of thorax and abdomen finer . . (*minuscula*) 13

13. Larger forms about 8 mm long; yellow markings less extensive, those on scutellum smaller or absent, none on propodeum or 1st tergum; New Guinea, New Ireland, northern Solomons. . . . . 10a. **minuscula sculleniana,** new subspecies

Smaller forms about 6.5 mm long; yellow markings more extensive, those on scutellum larger, propodeum with a pair of large oval spots, and 1st tergum with a small pair; Papua (Owen Stanley Mountains) . . . . . 10b. **minuscula stanleyensis,** new subspecies

14. Clypeal process with 4 teeth, the widely separated lateral pair near side of process and lying just above clypeal margin, the median pair well developed, separated from each other by a narrow distance (Figure 12); clypeal margin quinquedentate; forebasitarsus with 9–10 spines; New Guinea . . . . . 11. **vechti,** new species

Clypeal process with 2 widely separated teeth lying just above clypeal margin, the latter quadridentate (Figure 13); forebasitarsus with 7–8 spines . . (*venusta*) 15

15. Extensively marked with yellow, the head above with 4 yellow spots; pronotum, mesopleuron, scutellum, postscutellum, and propodeum all marked with yellow; the 3rd to 5th terga with apical yellow bands; lateral clypeal lobes with subcontiguous larger punctures as well as dense micropunctures; New Guinea east of 146°, Prince of Wales Island . . . . . 12a. **venusta oceanica** Brèthes

Yellow markings more reduced, lacking on at least mesopleuron, propodeum, and 3rd tergum; lateral clypeal lobes almost devoid of larger punctures 16

16. Head above with 4 yellow spots; pronotum, scutellum, and postscutellum marked with yellow; 3rd tergum black; Kei and Aru Islands . . . . . 12b. **venusta keiensis** Strand

Head above with only a pair of yellow spots; thorax black except for postscutellum; 3rd tergum with posterolateral yellow spots; New Guinea west of 146° . . . . . 12c. **venusta atrescens,** new subspecies

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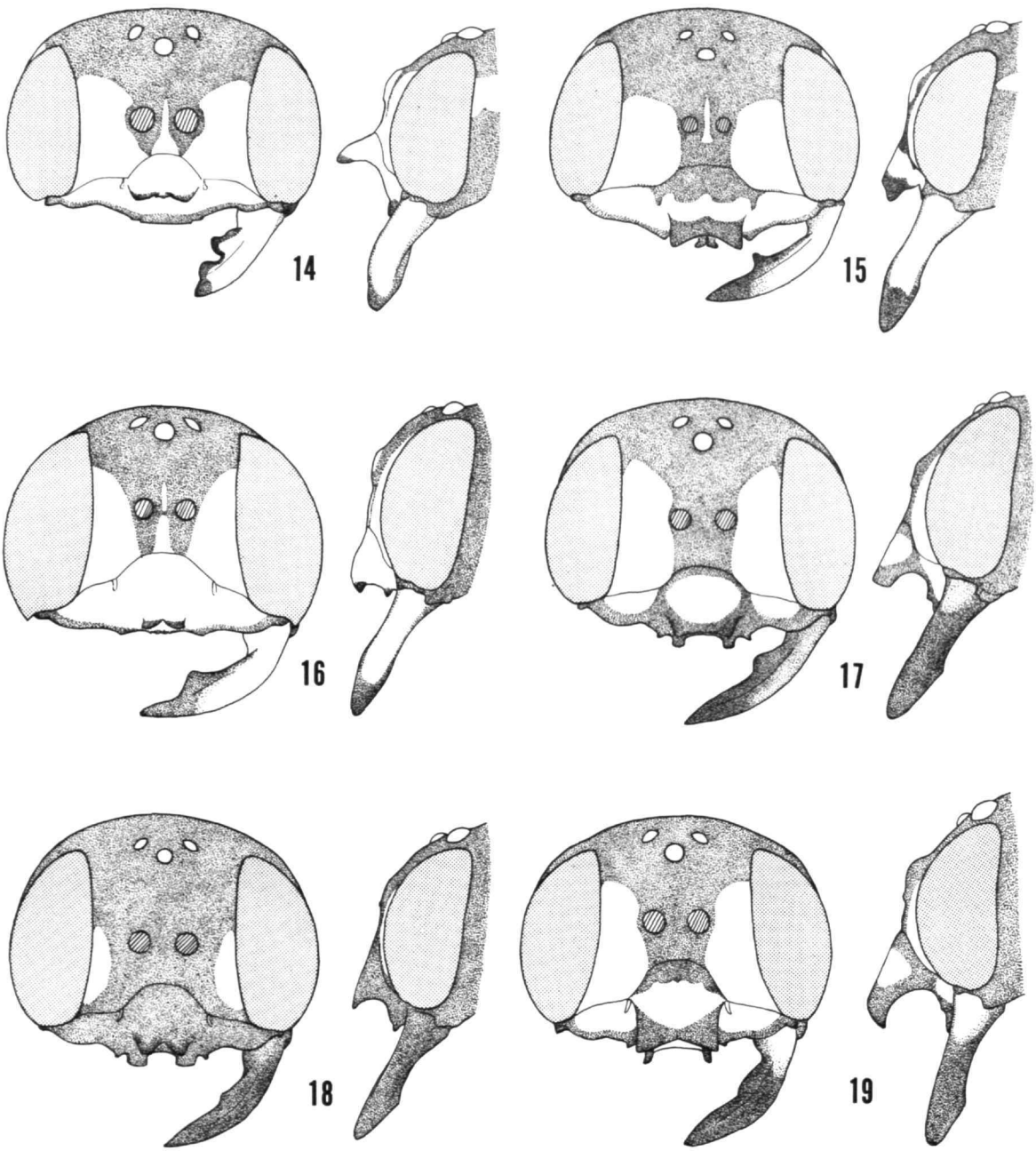


FIGURES 14–19.—Female head, frontal view at left, profile at right. 14, *C. mordax*, new species; holotype, Laloki, Papua, New Guinea. 15, *C. toxopeusi*, new species; holotype, Hollandia, West New Guinea. 16, *C. vellensis vellensis*, new subspecies; holotype, Vella Lavella Island, Solomons. 17, *C. bougainvillensis solomonis*, new subspecies; paratype, Tenaru River, Guadalcanal. 18, *C. bougainvillensis novogeorgica*, new subspecies; holotype, Munda Point area, New Georgia, Solomon Islands. 19, *C. bougainvillensis bougainvillensis* Tsuneki; Bougainville, Solomon Islands.

17. Inner eye margins not convergent above; apical margin of clypeus broadly and slightly produced on median third; inner margin of mandible with 2 very large teeth (Figure 14); southeastern New Guinea (Port Moresby, Laloki) . . . . . 13. **mordax,** new species

Inner eye margins convergent above (Figures 15–19); apical margin of clypeus either narrowly produced in middle or deeply emarginate; inner margin of mandible with a single large tooth 18

18. Mesopleuron with a large vertical lamellate tooth; apical margin of clypeus with a rather narrow projection in middle and a tooth on either side about one-third the distance to side of clypeus (Figure 15); pygidium relatively narrow, its length 1.5 times its greatest width, the apex narrower than base and truncate; West New Guinea (Hollandia) . . . . . 14. **toxopeusi,** new species

Mesopleuron without a tooth; apical margin of clypeus not or only very slightly produced in middle (Figures 16–19) 19

19. Apical margin of clypeus in middle very slightly produced and truncate (Figure 16); 1st abdominal segment narrower, its length 1.7 times its median width; pygidium narrower, 1.6–1.7 times as long as its width across middle . . (*vellensis*) 20

Apical margin of clypeus deeply emarginate in middle (Figures 17–19); 1st abdominal segment broader, its length only slightly more than its greatest width; pygidium broader (Figure 23), its length about 1.2 times its greatest width . . (*bougainvillensis*) 23

20. Head, thorax, and abdomen with extensive lemon yellow markings; all legs with yellow or red markings including hind trochanter and tibia 21

Head with some pale yellow markings, thorax and abdomen immaculate; fore and mid legs with a few reduced yellow markings, hind leg entirely dark; New Georgia. . . . . 15d. **vellensis segiensis,** new subspecies

21. Legs black and yellow; antenna black, the flagellum yellowish beneath; scutellum and 1st abdominal segment black; Bougainville, Buka . . . . 15c. **vellensis fordi,** new subspecies

Legs red and yellow; antenna black with flagellum reddish beneath, or reddish above and yellow beneath, the scape always yellow beneath 22

22. Scutellum and 1st tergum extensively yellow, 5th tergum with small yellow markings; antenna light reddish above, yellow beneath; legs entirely red and yellow; Vella Lavella . . . . . 15a. **vellensis vellensis,** new subspecies

Scutellum, 1st and 5th terga entirely black; antenna dark above, scape yellow beneath and flagellum reddish beneath; hind tarsus infuscated; Santa Ysabel . . . . . 15b. **vellensis obrieni,** new subspecies

23. Clypeal process truncate at apex (Figure 17); 2nd tergum with a median yellow spot at base and a narrow apical band, 3rd tergum with a broader apical band, the other terga entirely black; Guadalcanal, Santa Ysabel . . . . 16a. **bougainvillensis solomonis,** new subspecies

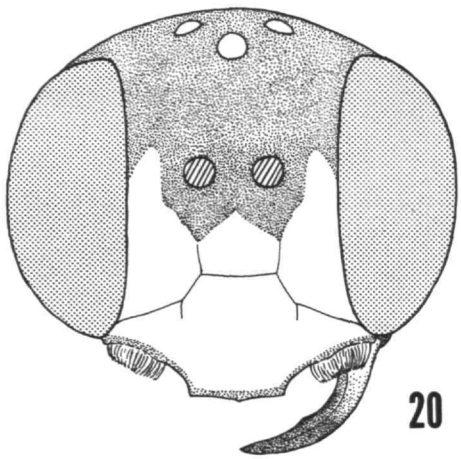
Clypeal process emarginate at apex (Figures 18–19); abdomen not marked as above, either entirely black (*novogeorgica*), or with basal terga mostly red (*lavellensis*), or with paired apical yellow spots on 1st tergum, basal and posterolateral spots on 2nd, and apical band on 3rd (*bougainvillensis*) 24

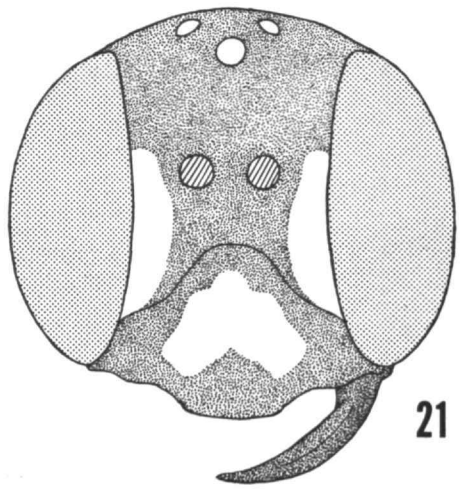
24. Viewed from above the clypeal process large (Figure 19), as broad at apex as at base (similar in shape to other subspecies in smaller specimens); abdomen black with yellow maculations as detailed in 2nd alternate of couplet 23; Bougainville, Buka, New Ireland . . . . . 16d. **bougainvillensis bougainvillensis** Tsuneki

Viewed from above the clypeal process smaller, tapering toward apex (Figure 18); abdomen entirely black, or black and red 25

25. Propodeal enclosure weakly transversely rugose except at extreme base where there are some short oblique rugae, a few large punctures laterally; longer body hairs brownish to golden; legs red, body extensively maculated with yellow and red; Vella Lavella, Gizo . . . . . 16b. **bougainvillensis lavellensis,** new subspecies

Propodeal enclosure smooth except for the short oblique rugae at extreme base and a few large punctures laterally; longer body hairs black; legs and body black, except for a small creamy spot along inner eye margin, and occasionally similarly colored, paired spots on pronotum and postscutellum; New Georgia . . . 16c. **bougainvillensis novogeorgica,** new subspecies





FIGURES 20–21.—Male head. 20, *C. pictiventris immolator* Smith; Tenaru River, Guadalcanal. 21, *C. bougainvillensis novogeorgica*, new subspecies; paratype, Munda Point area, New Georgia, Solomon Islands.

26. Supraclypeal area tuberculate, but not so strongly as in female (Figure 20); hind coxa strongly carinate beneath on inner margin; 2nd sternum at base with a raised, flat, semicircular area which is abruptly declivous posteriorly; New Guinea, Bismarcks, and Solomons . . . . . 1. **pictiventris immolator** Smith

Supraclypeal area evenly convex or flat; hind coxa not carinate beneath; 2nd sternum flat at base or if slightly raised then not abruptly declivous posteriorly 27

27. Apical margin of clypeus with a fimbria of curled, waxy-appearing hairs on the lateral third to fifth 28

Apical margin of clypeus not fimbriate 35

28. None of sterna fimbriate at base 29

Fifth and 6th sterna each with a subbasal transverse fimbria that is frequently concealed by apex of preceding sternum 33

29. Propodeal enclosure with regular oblique rugae; clypeal fimbria narrower, present on lateral fourth of margin 30

Propodeal enclosure with a few short rugae at base, the surface elsewhere finely roughened; clypeal fimbria broader, present on lateral third . . . . (*venusta*) 31

30. Propodeal rugae more separated, about 8 on each side of enclosure; pale markings ivory, present, in addition to other parts, on mesopleuron, propodeum, 1st tergum, and almost all of 1st and 2nd sterna; pygidium ferruginous; northeast New Guinea (Karimui) . . . . . 6. **karimuiensis**, new species

Propodeal rugae closer, about a dozen on each side of enclosure; pale markings yellow, lacking on mesopleuron, propodeum, 1st abdominal segment, 2nd sternum with only a pair of tiny posterolateral spots; pygidium black; New Ireland . . . . . 7. **brandti**, new species

31. Legs red and yellow; vertex with 4 yellow spots, thorax with spots on pronotum, scutellum, postscutellum, mesopleuron, and propodeum, abdominal segments extensively banded or spotted; New Guinea east of 146° . . . . . 12a. **venusta oceanica** Brèthes

Yellow markings more reduced, always lacking on mesopleuron and propodeum 32

32. Legs red and yellow; thorax with more yellow markings, always present on pronotal disk and postscutellum, and occasionally on scutellum; terga 2 and 4 through 6 with apical yellow bands; Kei and Aru Islands . . . . . 12b. **venusta keiensis** Strand
Legs black and yellow; thorax sometimes all black, at most with small spots on pronotal disk and postscutellum; 6th tergum always black, and occasionally some of other terga entirely black or spotted only; New Guinea west of 146° . . 12c. **venusta atrescens,** new subspecies

33. Propodeal enclosure entirely coarsely and contiguously punctate; anterior carina on lateral surface of pronotum lamellate in middle, and extending onto lateral fourth of dorsal surface; thorax and hind tibiae immaculate; New Guinea . . . . . 9. **reicula,** new species
Propodeal enclosure micropunctate except for a few large punctures along margins and median groove; anterior carina on pronotum not lamellate, not present on dorsal surface; pronotum, postscutellum, and hind tibiae maculated with yellow; 4th tergum immaculate, and frequently the 5th also . . (*minuscula*) 34

34. Yellow spots on pronotum larger, abdomen with apical yellow bands on 3rd and 6th terga, and occasionally the 5th also, and some sterna with yellow spots; New Guinea, Bismarcks, northern Solomons . . . . . 10a. **minuscula sculleniana,** new subspecies
Yellow spots on pronotum smaller, abdomen without apical yellow bands on any terga, the sterna immaculate; Solomons (Shortland Island) . . . . . 10c. **minuscula korovensis,** new subspecies

35. Posterior surface of propodeum with only a few large, shallow, scattered punctures; apical margin of median lobe of clypeus clearly tridentate, the median tooth weaker than lateral teeth . . . (*millironi*) 36
Posterior surface of propodeum with most of the larger punctures deeper and subcontiguous; apical margin of median lobe of clypeus broadly rounded (*bougainvillensis*, Figure 21) or very weakly tridentate (*vellensis*) 37

36. Tegula red; legs red and yellow; terga 2 to 6 with yellow markings; clypeus entirely yellow; Guadalcanal, Santa Ysabel (?) . . . . . 8a. **millironi millironi,** new subspecies
Tegula dark brown; legs black and yellow; terga 2, 3, and 6 with yellow markings; clypeus with basal and apical margins narrowly black as is the lateral lobe; Malaita . . . . . 8c. **millironi malaitensis,** new subspecies

37. Apical margin of median clypeal lobe very weakly tridentate, the lateral tooth stronger than median; 1st tergum more slender, twice as long as wide . . . (*vellensis*) 38
Apical margin of median clypeal lobe broadly rounded; 1st tergum stockier, 1.3 times as long as wide . . . . . (*bougainvillensis*) 39

38. Second tergum with paired anterior and posterolateral yellow spots; hind femur and tibia black; Bougainville, Buka . . . . . 15c. **vellensis fordi,** new subspecies
Second tergum almost always with a larger median anterior spot, posterolateral spots lacking; hind femur reddish at apex, hind tibia reddish at base and apex; Santa Ysabel . . . . . 15b. **vellensis obrieni,** new subspecies

39. Longer body hairs black; abdomen entirely black, the legs also except for narrow ivory streak on fore and mid tibiae; New Georgia . . 16c. **bougainvillensis novogeorgica,** new subspecies
Longer body hairs brown or grayish; abdomen black and yellow or red and yellow. . . . 40

40. Legs black and yellow; scutellum black; none of integument red; Bougainville, Buka, New Ireland . . . . . 16d. **bougainvillensis bougainvillensis** Tsuneki
Legs red or red and yellow, at most the hind tarsi infuscated; scutellum with a transverse yellow band 41

41. Ground color of abdomen black, the 2nd tergum anteriorly with a pair of yellow spots or a single larger spot, and 2nd and 3rd terga with apical yellow bands; clypeus yellow, legs red and yellow except hind tarsus infuscated; Guadalcanal, Santa Ysabel . . . . . 16a. **bougainvillensis solomonis,** new subspecies
Ground color of abdomen red, the 1st tergum with a tiny yellow spot at apex, and 3rd tergum with a very narrow apical yellow band; clypeus red except apex; legs red except hind tarsus infuscated; Vella Lavella, Gizo . . . . 16b. **bougainvillensis lavellensis,** new subspecies

1. *Cerceris pictiventris immolator* Smith

FIGURES 1, 3, 20, 22

Cerceris immolator Smith, 1864, p. 37.—Dalla Torre, 1897, p. 463.
Cerceris papuana Cameron, 1906, p. 57.
Cerceris pictiventris immolator van der Vecht, 1964, p. 354.—Tsuneki, 1968b, p. 1.

This is one of the most easily recognized forms of *Cerceris* in the area covered in this work, being distinguished at once in the female sex by the lack of a clypeal process and of a lateral hypopygial tooth, and in both sexes by the swollen supraclypeal area, the strong carina beneath on hind coxa along inner margin, and the raised semicircular platform at the base of the second sternum. Superficially in general color pattern, punctation, and size it resembles *C. minuscula sculleniana,* new subspecies, of eastern New Guinea. It has, also, the widest distribution of any of the forms treated here, and is the only Melanesian taxon occurring in New Guinea, the Bismarcks, and the Solomons.

It is quite variable in coloration, and to a lesser extent in punctation. A series from a circumscribed locality, such as those available from Nadzab, Mt. Gyifrie, and Hollandia, shows rather considerable variation in color markings. The following description cites both the maximum and minimum amounts of yellow in the specimens studied from the Melanesian area.

I have examined the holotypes of both *immolator* and *papuana* and can confirm the synonymy established by van der Vecht (1964). Smith's type from Waigeu, off the Vogelkop area of West New Guinea, is a male, not a female as he stated. It is one of the darker variants of *immolator,* having yellow only on the clypeus, supraclypeal area, lower front, spot on tegula, small spot at the base of second tergum, small and tiny posterolateral spots, respectively, on third and fifth terga, and a similar small spot on third sternum. Cameron's type from Manokwari, West New Guinea, is more brightly marked with yellow, and is an intermediate between the most and least melanic forms.

J. van der Vecht (1964) recognized five subspecies, typical *pictiventris* Dahlbom, 1845, from Java, Sumatra and Borneo, *p. novarae* Saussure, 1867, from India, *p. formosicola* Strand, 1913, from Formosa, *p. praedata* Smith, 1861, from the northern Moluccas, and *p. immolator* Smith, 1864, from the Papuan area, but gave no characters for separating these taxa. I am not at all certain, however, that *immolator* can be maintained as subspecifically distinct from typical *pictiventris.* The only nearly consistent differentiating character of which I am aware is that *pictiventris* typically has a pair of yellow spots on the propodeum which are always lacking in *immolator.* One of five Javan specimens of typical *pictiventris* sent to me by van der Vecht, however, lacks the propodeal spots. Furthermore, specimens from Batjan, Ambon, and Celebes are referable to *immolator* based on the absence of propodeal spots; this raises a question as to the discreteness of *pictiventris praedata.*

This taxon belongs to the section of the genus which preys on small solitary bees. The precise prey of *p. immolator* is unknown, but the Formosan subspecies, *p. formosicola,* is known to prey on *Halictus.* J. van der Vecht (1964) reported typical *pictiventris* as being a very common species in cultivated areas to an altitude of 900 meters, and that females have been taken occasionally on flowers of *Antigonon.*

FEMALE.—Length 9–11 mm, forewing 7–8.5 mm. Black, the following yellow in the least maculated specimens: mandibles except apices, clypeus except apical margin, lower half of supraclypeal area and broad mark along lower inner eye margins narrowing above and reaching a point slightly above level of antennal insertions, scape beneath, tiny spot on tegula, small transverse basal spot on 2nd tergum, tiny posterolateral mark on the 3rd tergum and an even smaller one on the 5th tergum, apices of mid and hind coxae beneath, all trochanters beneath, femora to varying extents beneath, fore and mid tibiae except a spot beneath, hind tibia with short median streak on outer surface, and fore and mid basitarsal segments. The most extensively maculated New Guinea specimens have the following yellow in addition: tiny spot behind eye above on temple, a pair of small spots on pronotum, larger spot on tegula, short transverse band on postscutellum, larger basal band on 2nd tergum, 3rd entirely yellow except a broad triangular spot at base, spots on 5th tergum larger and united posteriorly, posterolateral spots on 2nd to 5th sterna, all of fore and mid femora except short brownish streaks above, outer surface of hind femora, tibiae entirely except hind pair with small brownish spot at apex within, and all tarsi except apical 4 segments of hind pair. Flagellum beneath, and some of tarsal segments to varying extents, fulvous. Vestiture sparse, short, and pale. Wings slightly to moderately infumated with brownish, more strongly so at tip and in marginal cell, stigma and veins darker brown.

Head shining, in frontal view subcircular (Figure 3), median height (apex of clypeus to posterior ocelli) 0.8 times the greatest width; mandible with a very small blunt tooth at basal third along inner margin; clypeus with medium-sized punctures more or less confluent in rows, without raised process, median portion convex on basal three-fourths and apical fourth flattened before the broadly truncate apex, the apical margin with a blunt tooth on each side of median lobe; supraclypeal area raised into a strong tubercle below interantennal lamella; front and temples contiguously punctate but not rugose, the vertex less closely punctate; 1st and 2nd flagellar segments subequal in length.

Thorax shining; dorsum of pronotum, scutum, scutellum, mesopleuron, and propodeum mostly with rounded, moderately deep, contiguous to subcontiguous punctures; anterior carina on lateral surface of pronotum not lamellate, attaining the dorsal surface but not extending onto it; tegula not swollen; postscutellum in middle with only a few scattered large punctures; lateral surface of pronotum irregularly rugosopunctate; mesopleuron not dentate or tuberculate; metapleuron with moderately close oblique rugae which become much weaker below; propodeal enclosure with a median, shallow, narrow crenulate groove, the lateral grooves more coarsely crenulate, the surface otherwise micropunctate; concave area above abdominal attachment more or less circular, impunctate, with two longitudinal, gently arched carinae.

Comb of fore basitarsus with 7 spines; hind tibia with 6 serrations.

Abdomen shining; 1st tergum about as broad as long, with coarse, somewhat separated punctures; 2nd to 5th terga more closely punctate; pygidium (Figure 22) narrow, the length almost twice the greatest width (near base), the apex rounded, the surface irregularly and weakly wrinkled, the basal half with scattered suberect setae; 1st sternum with a rounded median keel on basal half; 2nd sternum with a small semicircular platform at base which is abruptly declivous posteriorly; 5th sternum swollen posterolaterally but not dentate; hypopygium (Figure 1) with apical teeth separated by a narrow U-shaped emargination, the lateral teeth lacking.

MALE.—Length 7.5–11 mm, forewing 6–8 mm. Coloration similar to female except as follows. In the least maculated specimens the thorax entirely black, abdomen black except 2nd tergum with a pair of small basal spots, coxae black, trochanters partly yellow, fore and mid femora with a short yellow streak beneath, fore tibia yellow except beneath, mid tibia yellow outwardly on basal half, and basal segment of fore and mid tarsi yellow. The most extensively maculated New Guinea males are similar in color pattern to the description given above for the females except as follows: spot behind eyes lacking; lateral spots present on 4th tergum, 6th tergum with an apical band slightly narrowed in middle on anterior margin, hind femora yellow only at tip, and only basal half or two-thirds of hind tibiae yellow. Vestiture and wing color similar to those of female.

Sculpture similar to that of female with the following differences: clypeus entirely evenly convex, the apical margin of median lobe feebly tridentate, the apical margin with a fimbria of waxy-appearing, curled hair on lateral fourth (Figure 20); supraclypeal area not so strongly raised; carina on lateral surface of pronotum extending a short distance inward on dorsal surface; pygidial area coarsely punctate, the sides slightly rounded, the greatest width 0.7 times the median length; sterna 5 and 6 without subbasal fimbriae; hypopygium semicircularly emarginate at tip, the lateral teeth acute and slender.

Waigeu: 1♂, "Wag." (Oxford University, holotype of *immolator*).

Schouten Islands: 1♂, Biak Airport, 19–24 May 1959, T. C. Maa (BPBM). 4♂, Mangrowawa, Biak Island, 50–100 m, 31 May 1959, T. C. Maa (BPBM).

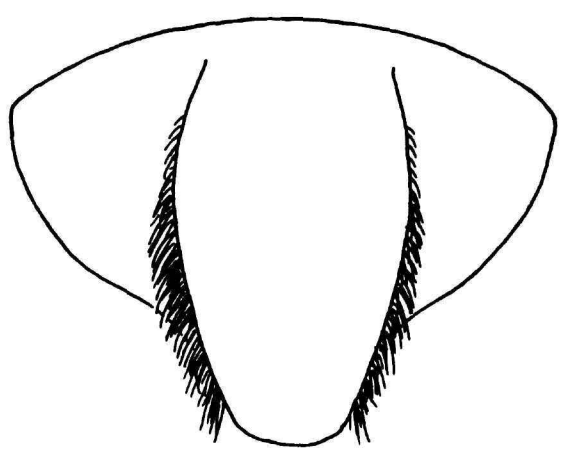


FIGURE 22.—Female pygidium, *C. pictiventris immolator* Smith; Nadzab, New Guinea.

West New Guinea: 1♀, Manokwari, 12 May 1903 (ZM—the holotype of *papuana* Cameron). 5♀, 6♂, Mt. Gyifrie, sea level—1000 ft, April 1939, L. E. Cheesman (SAM). 1♀, Bogia, 1–10 February 1943, T. Okada (KU). 1♂, Genjam, 40 km west of Hollandia, 100–200 m, 1–10 March 1960, T. C. Maa (BPBM). 2♀, 11♂, Sabron, Cyclops Mountains, 930 ft, April (♀, 9♂) and May (♀, 2♂) 1936, L. E. Cheesman (BMNH). 1♀, 1♂, Sentani, 90+ m, 22 June 1959, T. C. Maa (BPBM). 8♂, Njau-Limon, south of Mt. Bougainville, 300 ft, March 1936, L. E. Cheesman (BMNH).

Territory of New Guinea: 1♀, Vanimo, April 1939, L. E. Cheesman (SAM). 1♂, Torricelli Mountains, 200–1000 ft, January 1939, L. E. Cheesman (SAM). 1♂, Maprik, Sepik District, 150 m, 29 December 1959 to 17 January 1960, T. C. Maa (BPBM). 5♀, 3♂, Sattelberg, Huon Gulf, 1899–1900, Biro (TMA). 2♂, Simbang, Huon Gulf, 1898, Biro (TMA). 1♂, Nadzab, Markham River Valley, 11 June 1944, K. V. Krombein (KVK). 1♀, 6♂, along east fork of Ngafir Creek, Nadzab, 18 June (♂), 13 July (5♂) and 13 August (♀) 1944, K. V. Krombein (KVK). 1♀, 3♂, Nadzab, 23 July (♀, 2♂) and 25 August (♂) 1944, U. N. Lanham (KVK). 6♂, Nasawampum, 30 km northwest of Lae, 22 May 1959, C. D. Michener (BPBM).

Papua: 1♂, Brown River, Central District, 23 May 1956, E. J. Ford, Jr. (BPBM). 1♀, 1♂, Brown River, 22 April (♂) and 25 May (♀) 1959, C. D. Michener (BPBM). 1♂, Kokoda, 1200 ft, April 1933, L. E. Cheesman (BMNH).

Bismarck Archipelago: 1♀, Vunakanau, Gazelle Peninsula, New Britain, 22 May 1956, J. L. Gressitt (BPBM). 1♀, Lindenhafen, 2 miles south of coast, New Britain, 24 April 1956, J. L. Gressitt, on cocoa (BPBM). 2♂, Keravat, New Britain, 135 m, 20–25 November 1959, T. C. Maa (BPBM). 2♂, Vunabakan, 10 km east of Kavieng, New Ireland, 180 m, 16–20 November 1959, T. C. Maa (BPBM). 1♂, Kavieng, New Ireland, October 1936, L. E. Cheesman (BMNH). 1♀, Kandan, New Ireland, 1 January 1960, W. W. Brandt (BPBM).

Solomon Islands: 2♂, Tokinoitu, south Bougainville, 20 m, 2 June 1956, J. L. Gressitt (BPBM). 1♂, Kieta, south Bougainville, 30 November 1959, T. C. Maa (BPBM). 1♀, Gizo Island, New Georgia group, 100 m, 20 July 1964, J. and M. Sedlacek, in Malaise trap (BPBM). 1♀, 1♂, Kolotuve to Sukapisu, along jungle trail, Santa Ysabel, 20 June 1960, C. W. O'Brien (BPBM). 1♂, Roroni near Tetere, Guadalcanal, 24 May 1960, C. W. O'Brien (BPBM). 3♀, 1♂, Betikama River, Guadalcanal, August 1960, W. W. Brandt (BPBM). 1♂, Tapenanje, Guadalcanal, 10–23 December 1953, J. D. Bradley, (BMNH). 1♀, Tenaru, Gaudalcanal, 16 October 1943, J. G. Franclemont (KVK). 2♂, Tenaru, January 1945, G. E. Bohart (CAS). 2♀, 6♂, Lunga River bridge, Guadalcanal, 16 July to 25 September 1960, C. W. O'Brien (BPBM). 3♂, Florida Island, March 1945, G. E. Bohart (USNM). 1♀, 1♂, Tulagi, Florida, 2 September 1933 (♀, on low herbage) and 16 September 1934 (♂, on *Antigone*), H. T. Pagden (BMNH).

Most of the specimens that I captured at Nadzab were taken in primary jungle at altitudes not exceeding 800 feet.

2. *Cerceris cristovalensis*, new species

FIGURE 4

The very delicate and sparse punctation immediately distinguishes *cristovalensis* from other Melanesian species. Although the clypeal lamella is superficially similar in form to that found in *misoolensis, cyclops,* and *papuensis,* there is no close relationship.

HOLOTYPE.— ♀, Bweinaniawarikiapu, San Cristoval, Solomon Islands, 11 August 1960, C. W. O'Brien (BPBM).

Length 10.5 mm, forewing 7.5 mm. Black, moderately shiny except side of thorax, the following creamy: splotch on basal half of mandible, clypeus, side of face upward to level of middle of antennal insertion, lateral spot on pronotal disk, band on postscutellum, pair of large round spots covering most of side and posterior surface of propodeum, small quadrate spot at base of 2nd tergum, narrow posterolateral spot on 3rd tergum, small spot on hind trochanter, and outer surface of all tibiae. Fore tarsi brown. Vestiture moderately dense on head and side of thorax, sparse on dorsum of thorax and abdomen, short and silvery. Wings slightly infumated except marginal cell and apex of forewing anteriorly more strongly so, stigma and veins brown.

Head (Figure 4) subcircular in frontal aspect, the height (apex of clypeus to posterior ocelli) 0.7 times the width; inner eye margins not converging above or below; inner margin of mandible with a single blunt tooth in middle; apical margin of median lobe of clypeus with a pair of small, widely separated teeth

lying almost below each angle of the clypeal process; clypeus with many minute punctures and a few scattered larger ones, the process broad and low, on apical third, evanescent in middle and consisting of 2 large, separate, acutely angled laminae; supraclypeal area convex; front and vertex with moderately large, subcontiguous to slightly separated punctures, the front not rugose; 2nd flagellar segment about three-fourths as long as 1st.

Dorsum of thorax and propodeum with only a few, scattered punctures; anterior carina on side of pronotum not lamellate, not extending onto dorsal surface; mesopleuron obliquely rugose on lower half; metapleuron with very fine oblique rugae; propodeal enclosure with moderately deep, noncrenulate median and lateral grooves, the surface finely shagreened.

Comb of fore basitarsus with 6 spines; hind tibia with 5 serrations.

First abdominal segment slender, twice as long as wide, the sides straight, the dorsal surface with scattered large, shallow punctures; 2nd to 5th terga with extremely fine punctures and a very few larger ones; pygidium with sides rounded, tapering slightly toward apex, the length 1.7 times the greatest width, the surface anteriorly with a few punctures, irregularly wrinkled on posterior three-fourths; 1st sternum with a short keel on basal fourth; 2nd sternum flat at base; 5th sternum not swollen laterally; hypopygium with apical teeth separated by a narrow U-shaped emargination, lateral margin with a small acute tooth adjacent to apical tooth.

MALE.—Unknown.

PARATYPES.—1 ♀, Kira-Kira, San Cristoval, 0–50 m, 10 November 1964, R. Straatman, swept (BPBM). 1 ♀, Wugiroga, San Cristoval, 9 August 1960, C. W. O'Brien (BPBM). The paratypes are 8.5–9 mm long; that from Kira-Kira has the entire hind trochanter creamy. The specimen from Kira-Kira has been placed in the United States National Museum.

3. *Cerceris cyclops*, new species

FIGURE 5

This species, known at present from the unique female type, is distinctive in the Melanesian fauna by reason of the rugosopunctate propodeal enclosure and shape of the clypeal process. *C. misoolensis* from Misool Island is rather similar in these two characters but differs in the dentition of the apical margin of clypeus and inner margin of mandible, and the coloration, as detailed in the foregoing key.

HOLOTYPE.— ♀, Sabron, Cyclops Mountains, 930 ft (a handwritten label beneath the printed one states that the specimen was taken in lower mossy forest, 2000–2500 ft), April 1936, L. E. Cheesman (BMNH).

Length 12 mm, forewing 9.5 mm. Black, rather dull except top of head, the following yellow: basal half of mandible, clypeus, face, front halfway to anterior ocellus, scape, tiny spot behind eye above, broad band on pronotal dorsum extended posteriorly to include tubercles, tegula except margins, transverse bands on scutellum and postscutellum, small spot above on mesopleuron, broad band on sides of dorsal and posterior surfaces of propodeum, apical half of 1st tergum, 2nd tergum except basal third, narrow apical bands on 3rd to 5th terga broadened at sides, 1st and 2nd sterna except basal third, large triangular spots at sides posteriorly of 3rd and 4th sterna, most of coxae and trochanters beneath, most of femora except above, fore and mid tibiae and tarsi, and hind tibia except on apical half behind. The following are ferruginous: flagellum beneath, margins of tegula, basal segment of hind tarsus entirely and the succeeding segments beneath. Vestiture sparse and short, light brown above, silvery on clypeus and sides of thorax. Wings clear except marginal cell and apex anteriorly of forewing infumated with brown, stigma and basal veins dark brown, the other veins lighter.

Head, (Figure 5) subcircular in frontal aspect, the height (apex of clypeus to posterior ocelli) 0.75 times the width; inner eye margins not converging above or below; inner margin of mandible with 2 blunt teeth at middle; apical margin of median lobe of clypeus quinquedentate, the middle tooth tiny and rounded, the next pair broad and rounded, the outer pair smaller and right-angled; clypeus with large, subcontiguous punctures, the process broad and low, evanescent in middle, consisting of 2 small, separated, acutely angled laminae; supraclypeal area convex; head with large subcontiguous punctures except beneath, front not rugose; 1st and 2nd flagellar segments subequal in length.

Thorax and propodeum coarsely and contiguously to subcontiguously punctate except postscutellum, propodeal enclosure, and metapleuron; tegula not inflated; postscutellum with very scattered small punctures; anterior carina on lateral surface of pronotum not lamellate, extending onto dorsum one-fourth the

336-553 O—69——3

distance to middle; mesopleuron not dentate or tuberculate; metapleuron with close, oblique rugae; propodeal enclosure with crenulate median and lateral grooves, the surface rugosopunctate, obliquely so on anterior half, arcuately so posteriorly; area above abdominal attachment with a pair of well-separated carinae, arched outwardly at ends.

Comb of fore basitarsus with 6 spines; hind tibia with 5 serrations.

First tergum subquadrate, length subequal to greatest width, the sides rounded, the surface coarsely and contiguously punctate; 2nd to 5th terga with similar sculpture; pygidium with sides rounded, the length almost twice the greatest width, surface irregularly wrinkled and with a few coarse, short, suberect setae on basal half; 1st sternum with a low rounded keel on basal half; 2nd sternum flat at base; 5th sternum not swollen laterally; hypopygium with apical teeth separated by a narrow U-shaped emargination, lateral margin with a small acute tooth adjacent to apical tooth.

MALE.—Unknown.

4. *Cerceris papuensis*, new species

FIGURE 6

The present species, known from a unique female, is closely related to *misoolensis* and *cyclops*, and differs from them in details of the color pattern, clypeal and mandibular dentition, and propodeal sculpture as detailed in the key.

HOLOTYPE.— ♀, Manokwari, West New Guinea, 15 November 1942, K. Kuya (KU).

Length 9 mm, forewing 6.5 mm. Black rather dull except abdomen, the following yellow: basal half of mandible, large median spot on clypeus, small spot on interantennal prominence, band along inner eye margin extending just above antennal insertions, scape beneath, small spot on tegula, band on postscutellum, tiny median spot near apex of 1st tergum, 2nd tergum except extreme apex, and an elongate black mark laterally near middle, band on apical third of 5th tergum, anterolateral spots on 2nd sternum, band on apical half of 3rd sternum, tiny lateral spot on 4th sternum, outer surface of fore and mid tibiae, streak on outer surface of basal two-thirds of hind tibia. The following ferruginous: flagellum beneath, spot on tegula, and fore and mid tarsi.

Sculpture and body ratios similar to those noted for *cyclops* with the following exceptions: head (Figure 6), inner margin of mandible with a single strong tooth in middle; apical margin of clypeus with 4 small blunt teeth, the inner pair separated by about the width of clypeal process, the outer pair close to inner; propodeal enclosure irregularly rugose; 2nd to 5th terga more sparsely punctate.

MALE.—Unknown.

5. *Cerceris misoolensis*, new species

FIGURE 7

This species, known only from a single female, is rather close to *C. cyclops*, differing essentially only in details of the dentition of mandible and clypeal margin, and sculpture of the propodeum.

HOLOTYPE.—♀, Fakal, Misool Island, 0–75 meters, 18 September 1948, M. A. Lieftinck (RNH).

Length 11 mm, forewing 9 mm. Black, rather dull except dorsum, the following creamy: basal half of mandible, clypeus, face, narrow streak on interantennal prominence, band along inner eye margin extending nearly to level of interantennal lamella, scape beneath, narrow apical band on pronotal dorsum interrupted in middle, small spot on tegula, band on postscutellum, small spot above on mesopleuron, tiny spot posteriorly on each side of 1st tergum, very narrow apical bands on 2nd to 5th terga, that of 2nd the widest, that of 3rd and 5th interrupted broadly in middle, spot on fore coxa, narrow streaks outwardly on fore and mid tibiae, and basal segments above of all tarsi. The following are ferruginous: apex of clypeal process, flagellum beneath, narrow margins of tegula, and fore and mid tibiae and tarsi except for creamy markings. Vestiture sparse, short, and silvery. Wings clear, the marginal cell and apex anteriorly of fore wing infumated, stigma dark brown, the veins a little lighter.

Sculpture and body ratios similar to those listed for *cyclops* with the following exceptions: head (Figure 7), inner margin of mandible with a single strong tooth in middle; apical margin of median lobe of clypeus quinquedentate, the teeth small, blunt, narrow, subequal in size, the inner 3 close together and separated by a short distance from the outer pair; propodeal enclosure rugose only not punctate, the median groove evanescent, the rugae oblique anterolaterally, arcuate on rest of enclosure.

MALE.—Unknown.

6. *Cerceris karimuiensis*, new species

FIGURE 8

This species is known from a single pair from Karimui in the Eastern Highlands District, Territory of New Guinea. The female is closer to *misoolensis* than to others of the known Melanesian species, but is readily distinguished by the more slender first abdominal segment and the color differences noted in the foregoing key.

HOLOTYPE.—♀, Karimui, northeastern New Guinea, 1080 m, 8–10 July 1963, J. Sedlacek (BPBM).

Length 9.5 mm, forewing 8.5 mm. Black, rather dull except dorsum, the following creamy: basal half of mandible, lateral lobe of clypeus, tiny spot on supraclypeal area, narrow streak on interantennal lamella, side of face narrowing laterally above and terminating just above top of lamella, tiny spot on vertex behind eye, scape beneath, band on pronotal dorsum narrowly interrupted at midline, band on postscutellum, small mesopleural spot below tegula, small posterolateral spot on propodeum, side narrowly and broad apical band on 1st tergum, basal fifth of 2nd tergum and a narrower band across apex, narrow, short posterolateral streak on 3rd tergum, narrow apical bands on 4th and 5th terga, 1st and 2nd sterna entirely except narrow transverse area at apex of 2nd, small lateral spot on 3rd sternum, smaller lateral spot on 4th sternum, streak on basal two-thirds of outer surface of fore and mid tibiae, and fore and mid basitarsi. The following ferruginous: flagellum beneath, tegula, narrow transverse streak at apex of 2nd sternum, apex of 5th sternum, 6th abdominal segment, small area at apex of fore and mid femora, fore tibia beneath, and fore tarsus beyond basal joint. Vestiture sparse, short, and silvery. Wings clear, the marginal cell and apex anteriorly of forewing infumated, stigma dark brown, the veins a little lighter.

Sculpture and body ratios similar to those listed for *cyclops* with the following exceptions: head (Figure 8), apical margin of median lobe of clypeus quinquedentate, the teeth small, narrow, blunt, subequal in size, the inner 3 close together and separated by a short distance from the outer pair; laminae of clypeal process closer together; propodeal enclosure with close rugae which are oblique anterolaterally and arcuate elsewhere; 1st abdominal segment 1.3 times longer than broad.

ALLOTYPE.—♂, Karimui, south of Goroka, northeastern New Guinea, 1000 m, 5 June 1961, J. L. and M. Gressitt (BPBM).

Length 7 mm, forewing 6.5 mm. Coloration similar to female with the following exceptions: clypeus entirely pale except extreme base of median section; supraclypeal area with a narrow streak extending onto interantennal lamella; pronotal band extending onto lateral lobe; scutellum with a pair of small lateral spots; anterior mark on 2nd tergum reduced to a small lateral spot; 6th tergum with a narrow apical band; 1st sternum with sides narrowly reddish; 5th and 6th sterna with tiny posterolateral spot; hind femur white on basal half outwardly; hind basitarsus white.

Characters peculiar to the male are: clypeus feebly and evenly convex, median lobe weakly tridentate, the lateral fourth of apical margin with a fimbria of waxy-appearing, curled hairs; 1st and 2nd flagellar segments subequal in length; 5th and 6th sterna without subbasal fimbriae.

7. *Cerceris brandti*, new species

This species, known only from a series of males from New Ireland, is almost unique in the Melanesian fauna because of the regularly rugose propodeal enclosure. *C. misoolensis*, known only from a female from Misool Island at the west end of New Guinea, and *C. karimuiensis*, known from both sexes from northeastern New Guinea, are the only other Melanesian species having a similar type of propodeal sculpture. In *karimuiensis* and *brandti* these rugae are all oblique, whereas in *misoolensis* they are oblique anteriorly, arcuate posteriorly; the rugae are more numerous and closer in *brandti* than in *karimuiensis*.

HOLOTYPE.—♂, Schleinitz Mountains, Lelet Plateau, New Ireland, October 1959, W. W. Brandt (BPBM).

Length 10 mm, forewing 8 mm. Black, the following yellow: basal half of mandible, clypeus except narrow strip along basal margin, lower half of interantennal lamella, side of front narrowing gradually above to a point slightly above top of antennal insertion, small spot beneath antennal scape, small vertexal spot behind eye, pair of small, narrowly separated spots on pronotal dorsum, small lateral spot on scutellum, band on postscutellum, bands on apical third of terga 2 through 5 narrowed gradually toward midline, separated apical spots on 6th tergum, tiny posterolateral spot on 2nd to 4th sterna; the following light reddish—fore femur beneath on apical half, fore and mid tibiae except for a narrow streak above, hind tibia on inner surface, fore tarsus, and mid and hind basitarsi. Vestiture dense,

short, light brown. Wings slightly infumated, the marginal cell and apex anteriorly more strongly so, stigma and veins light brown.

Head rounded in frontal aspect, the height 0.84 times the greatest width; inner eye margins more divergent above than below, the interocular distance at intersection of epistomal suture and inner eye margin 0.8 times this distance at level of posterior ocelli; clypeus convex, the apical margin of median lobe feebly tridentate, apical margin with a fimbria of curled, waxy-appearing hairs on lateral fourth; supraclypeal area flat; 1st flagellar segment slightly longer (1.1) than 2nd.

Thoracic dorsum with scattered moderate-sized punctures interspersed among dense minute punctures; tegula not inflated, with minute punctures only; anterior carina on lateral surface of pronotum not lamellate, not extending onto the dorsal surface; mesopleuron rugosopunctate, not dentate or tuberculate; metapleuron with close oblique rugae except in middle; propodeal enclosure with a deep median groove, elsewhere with close oblique rugae; remainder of propodeum with large subcontiguous punctures, becoming closer on lateral surface.

Abdominal dorsum with fine dense punctures and larger interspersed ones mostly separated by half the diameter of a puncture; 1st tergum with sides slightly rounded outwardly, the length a little less than width; pygidium with length about as great as basal width, the sides tapering slightly inward toward apex, the surface with moderately large, subcontiguous punctures; 1st sternum with a low median keel on basal third; 2nd sternum flat at base; 6th sternum with a small posterolateral tooth; hypopygium shallowly emarginate on apical margin, the lateral tooth short and acute.

FEMALE.—Unknown.

PARATYPES.—6 ♂; same data as holotype (BPBM). The paratypes are 8–10 mm long and agree closely with the holotype in color pattern and details of the sculpture. Paratypes have been deposited in the United States National Museum and the British Museum (Natural History).

8. *Cerceris millironi*, new species

This polytypic species of the Solomons is distinguished by the small, semicircular depressed area at the base of the second sternum and the rugosopunctate sculpture of the front and mesopleuron. *Cerceris vellensis* has the front and mesopleuron similarly sculptured, but the base of the second sternum is flat and the clypeal process in the female is differently shaped. *Cerceris minuscula* has a similarly shaped clypeal process, but *millironi* differs in such details as the presence of clypeal fimbriae in the male, the depression at the base of the second sternum, and the sculpture of the front and mesopleuron.

At the present time three subspecies are known, typical *millironi* from Guadalcanal and Santa Ysabel (?), *m. tulagiensis* from Florida Island, and *millironi malaitensis* from Malaita. These forms are easily separated by the characters used in the preceding key. It is probable that further intensive collecting on other islands of the Solomons group will lead to the discovery of additional discrete subspecies of this complex.

8a. *Cerceris millironi millironi*, new subspecies

FIGURE 9

The nominate form from Guadalcanal is distinguished from *m. tulagiensis* of Florida Island by the more extensive yellow markings and somewhat sparser abdominal punctation as detailed in the foregoing key.

Holotype.— ♀, Kiwi Creek, Guadalcanal, 6 August 1944, H. E. Milliron (USNM type 70713).

Length 10.5 mm, forewing 8.5 mm. Black, some what shining, the following yellow: basal two-thirds of mandible, clypeus except apical margin, face, band along inner eye margin extending upward almost level with top of interantennal prominence, scape, large paired spots on pronotal dorsum, tegula except margins, transverse bands on scutellum and postscutellum, curved oblique bands laterally on posterior surface of propodeum extending onto the lateral surface, transverse band on basal third of 2nd tergum and a small spot on each side posteriorly, 3rd tergum with a band which covers all the sides and apical margin narrowly in middle, narrow apical bands on 4th and 5th terga somewhat broader at sides than in middle, very small spot on each side posteriorly of 3rd sternum, and spot beneath at apex on fore and mid femora. The following are ferruginous: flagellum beneath, margins of tegula, and legs except coxae, yellow areas on fore and mid femora, a dark blotch on apical half of outer surface of hind femur, and hind tarsi. Vestiture short, sparse, mostly pale brownish. Wings slightly infumated with brownish, the marginal cell and apex anteriorly of forewing more strongly so, stigma and veins mostly testaceous.

Head (Figure 9) transversely oval in frontal aspect, the greatest width 1.4 times the height (apex of clypeus to posterior ocelli), the inner eye margins converging slightly above; inner margin of mandible with 2 close, acute teeth at middle, the basal one larger, apical margin of median lobe of clypeus with 4 teeth separated by shallow emarginations, the inner pair blunt and somewhat closer to each other than each is to the outer acute pair; surface of clypeus with sparse, larger punctures and close minute ones, raised in the middle into a low, broad transverse process just above the apex, the process with a free apical edge, broadly emarginate and notched in the middle; supraclypeal area convex; face with the larger punctures closer than on clypeus; front longitudinally rugosopunctate; vertex and temples punctate like face; 2nd flagellar segment seven-eighths as long as first.

Pronotal dorsum, scutum, and scutellum with the larger punctures moderately close, but not contiguous; tegula not inflated; postscutellum with very sparse, small punctures; anterior carina on lateral surface of pronotum not lamellate, produced onto dorsal surface a third the distance to center; mesopleuron obliquely and very coarsely rugosopunctate, not dentate or tuberculate; metapleuron with fine, close oblique rugae, propodeal enclosure with very short radiating rugae at base, finely crenulate median and lateral grooves, the rest of surface densely micropunctate; remainder of propodeum with large subcontiguous punctures except the concave area above abdominal attachment which has a pair of widely separated carinae curving outwardly above and below.

Comb of fore basitarsus with 7 spines; hind tibia with 6 serrations.

First abdominal segment subquadrate, 1.1 times as long as greatest width, the sides parallel except slightly convergent on apical fourth, the surface mostly with large, subcontiguous punctures; 2nd to 5th terga with somewhat smaller, more dispersed large punctures; pygidium moderately elongate, the greatest width (just before middle) 0.6 times the length, the sides rounded outwardly, the surface rather strongly, irregularly wrinkled and with a few suberect short setae on basal half; 1st sternum with a low rounded keel on basal half; 2nd sternum with a small subcircular depression at base; 5th sternum not swollen laterally; hypopygium with apical teeth separated by a narrow U-shaped emargination, the lateral margin with a moderately large, acute tooth at apical third.

The female paratypes are quite uniform in size, basic color pattern, vestiture, and punctation. A specimen from Tenaru River shows some reduction in size of pale maculations on thorax and abdomen, and the scutellum is immaculate.

ALLOTYPE.—♂, Tenaru River, Guadalcanal, January 1945, G. E. Bohart (CAS).

Length 8.5 mm, forewing 6.5 mm. Surface more shining than in female. Color similar to female except as follows: mandible dark, supraclypeal area dark, band along inner eye margin extending upward only to level of lower margin of antennal fossae, thorax entirely black, abdominal markings comparatively less extensive, no posterolateral yellow spots on 2nd tergum, 6th tergum with a yellow spot on each side posteriorly, venter of abdomen dark, mid and hind trochanters yellow beneath, no yellow on fore and mid femora, and fore and mid tibiae yellow on basal half or more of outer surface. Pubescence mostly silvery. Punctation as in female except as noted in next paragraph.

Characters peculiar to the male are: head height 0.8 times greatest width; clypeus feebly and evenly convex, apical margin of median lobe with a small tooth in middle, otherwise truncate, laterally without a fimbria; inner eye margins not converging above or below; 2nd flagellar segment slightly shorter than first; scutellum and propodeum with the larger punctures sparser than in female; 1st abdominal segment very slender, the greatest width 0.6 times the length; 5th and 6th sterna with transverse subbasal fimbriae; hypopygium at apex shallowly emarginate, the lateral teeth short and acute.

PARATYPES.—2 ♀, Guadalcanal, 1944, D. E. Beck (USNM). 1 ♀, Tenaru River, Guadalcanal, January 1945, G. E. Bohart (CAS). 1 ♀, Lunga River bridge, Guadalcanal, 21 July 1960, C. W. O'Brien (BPBM).

A male from Tapenanje, Guadalcanal, 10–23 December 1953, J. D. Bradley (BMNH) is not included in the type series because the head is missing. It has more yellow than the allotype including a pair of spots on the pronotal disk, a band on the postscutellum, a small posterolateral spot on the second tergum, and complete bands on the third through sixth terga.

There is also before me a single puzzling female from Kolotuve, Santa Ysabel, 21 June 1960, C. W. O'Brien (BPBM). In the extent of pale markings it agrees very well with the less maculated female paratype of typical *millironi* from Tenaru River, Guadalcanal. It appears darker, however, because the normal

yellow markings are cyanided and red. Pending further material from Santa Ysabel I include the specimen here tentatively, but exclude it from the type series.

8b. *Cerceris millironi tulagiensis*, new subspecies

HOLOTYPE.— ♀, Tulagi, Florida Island, Solomons, 25 December 1934, H. T. Padgen, #1749, taken with prey, (BMNH).

Length 12 mm, forewing 9 mm. Color similar to typical *millironi* except as follows: supraclypeal area black except for tiny yellow spot in middle, pronotum black, tegula entirely ferruginous, scutellum and propodeum black, 1st tergum with apex narrowly reddish, 2nd tergum with only a pair of small yellow spots at base, band of 3rd tergum narrower than in typical *millironi*, 4th and 5th terga with only small posterolateral yellow spots, sterna immaculate, fore and mid femora without yellow, anterior tibia streaked with yellow on outer surface, and mid tibia with a yellow spot at base on outer surface.

Punctation very similar to that of typical *millironi*, but somewhat denser on abdomen, many of the larger punctures on terga separated by about half the diameter of a puncture.

MALE.—Unknown.

PARATYPES.—2 ♀, same data as type, but 20 August 1933 (#504) and 22 July 1934 (#1415) (USNM, JvdV). The paratypes are quite similar to the type in size, color, and punctation. One of them is 11.5 mm long and both lack yellow markings on the 4th and 5th terga, and the 3rd tergum has only posterolateral spots instead of a complete band.

8c. *Cerceris millironi malaitensis*, new subspecies

This race is known from a single male from Malaita Island just east of Guadalcanal and Florida Islands, where the other races of *millironi* are to be found. It is a darker form, as in *m. tulagiensis*, and might be taken for the unknown male of that race except that the tegula is dark instead of ferruginous, and the legs black and yellow instead of mostly red and yellow.

HOLOTYPE.— ♂, Tangtalau, Malaita, Solomon Islands, 200 m, 25 September 1957, J. L. Gressitt (BPBM).

Length 8 mm, forewing 6.5 mm. Black, tegula dark brown, the following yellow: clypeus except basal and apical margins narrowly black as is the lateral lobe, band along inner eye margin extending upward to lower end of antennal insertions, narrow band on postscutellum slightly interrupted along midline, small basal spot on 2nd tergum, posterolateral spots on 3rd tergum narrowing toward middle, apical band on 6th tergum narrowly interrupted at midline, mid and hind trochanters, fore and mid tibiae and tarsi, and hind tibia on basal half.

Sculpture and proportions as in typical *millironi*.

FEMALE.—Unknown.

9. *Cerceris reicula*, new species

FIGURE 10

The extremely coarse punctation distinguishes both sexes of this New Guinea species from its very close relative *minuscula* Turner. In addition, the propodeal enclosure in both sexes is dull and has moderately large punctures along the margins instead of being shiny and micropunctate, the legs of the female are always partly red, and in the male the pronotal carina is lamellate on the lateral surface in the middle.

HOLOTYPE.— ♀, Eliptamin Valley, Western Highlands District, Territory of New Guinea, 1200–1350 m, 1–15 July 1959, W. W. Brandt (BPBM).

Length 9 mm, forewing 7 mm. Black, rather dull, the following lemon yellow: basal half of mandible, clypeus except apical margin and edge of process, broad band along inner eye margin extending upward to a level with top of interantennal lamella, streak on the latter, scape and flagellum beneath, large basal spot on 2nd tergum, band on apical three-fourths of 3rd tergum, tiny posterolateral spot on 4th tergum, small posterolateral spot on 5th tergum, and outer surface of fore and mid tibae. The following are reddish: apical half of mandible, fore and mid tarsi, mid tibia beneath, and apex of hind femur. Vestiture short and silvery. Wings clear but marginal cell and apex of forewing anteriorly infumated with brownish; stigma brown, veins testaceous.

Head (Figure 10) transversely oval in frontal aspect, the height three-fourths the greatest width, the inner eye margins not converging above or below; inner margin of mandible with 2 separated, low rounded teeth in middle; apical margin of median lobe of clypeus gently and broadly emarginate and with 2 teeth laterad of this section; surface of clypeus with contiguous punctures, raised in the middle into a low, broad transverse process on the apical fourth, the

process with a free edge which is broadly, obtusely emarginate; supraclypeal area flat; head closely and very coarsely punctate except beneath; 2nd flagellar segment three-fourths as long as first.

Thorax closely punctate, and more coarsely so than in *minuscula,* except that the postscutellum has small scattered punctures, the metapleuron has coarse oblique rugae, and the propodeal enclosure has scattered large punctures; tegula not inflated; mesopleuron not dentate or tuberculate.

Comb of fore basitarsus with 6 spines; hind tibia with 6 serrations.

First to 5th terga closely and more coarsely punctate than in *minuscula*; the 1st tergum subquadrate, the sides parallel except on apical fourth where they converge slightly; pygidium elongate oval, rather narrow, the greatest width just before middle, very slightly more than half the length, the surface irregularly wrinkled and with scattered, short suberect setae on basal half, the sides rounded; 1st sternum with a low rounded keel on basal third; 2nd sternum not raised at base; 5th sternum not swollen laterally; hypopygium with apical teeth separated by a narrow U-shaped emargination, the lateral margin with a small acute tooth at apical third.

Female paratypes are 8–9 mm long and show some variation in color. The female from Wamena has lateral spots on the pronotum and a band on the postscutellum, but lacks spots on the 4th and 5th terga, and the tegula is reddish. The specimen from Milne Bay has the lateral lobe of the clypeus black, lacks the basal spot on the 2nd tergum, but has a yellow band narrowly interrupted in the middle on the 3rd sternum, and the legs except coxae and hind tarsus are reddish. The female from Kutsime is the least maculated; the lateral clypeal lobe is black, the spot on the 2nd tergum is very tiny, and the band on the 3rd tergum is reduced to a pair of posterolateral ivory spots.

ALLOTYPE.— ♂, Kimbavi near Saidor, Finisterre Range, Madang District, Territory of New Guinea, 22–29 July 1958, W. W. Brandt (BPBM).

Length 7.5 mm, forewing 6.5 mm. Black and shining, the following yellow: basal half of mandible, clypeus except narrowly along apical margin, roughly triangular mark along inner eye margin broad below and narrowing gradually above to a point level with top of interantennal lamella, a large transverse posterolateral spot on 3rd tergum, hind trochanter, fore and mid tibiae outwardly, fore tarsus, and basal segment of mid tarsus. The following are reddish: apical half of mandible, flagellum narrowly beneath, 4 apical segments of mid tarsus, and hind tibia and tarsus beneath. Vestiture very sparse, silvery. Wings strongly infumated with brownish, the marginal cell and apex anteriorly of forewing more strongly so, stigma and veins dark brown.

Head coarsely and closely punctate except beneath, rounded in frontal aspect, the height 0.9 times the greatest width; inner eye margins more divergent above than below, the interocular distance at intersection of epistomal suture and inner eye margin 0.8 times this distance at level of posterior ocelli; clypeus convex, the apical margin of median lobe tridentate, apical margin with a fimbria of curled, waxy-appearing hairs on the lateral fourth; supraclypeal area convex; length of 1st and 2nd flagellar segments subequal.

Thorax very coarsely, deeply, and closely punctate except postscutellum, lateral surface of pronotum and metapleuron; tegula not inflated; postscutellum with small, more or less scattered punctures; anterior carina on lateral surface of pronotum lamellate in middle, the carina extending onto the dorsal surface half the distance toward middle; mesopleuron not dentate or tuberculate; metapleuron with close oblique rugae; propodeal enclosure with a median groove, elsewhere punctate like the rest of propodeum; concave area above abdominal attachment small, impunctate, not carinate on either side of the impressed midline.

Abdomen with dorsum except pygidium coarsely and closely punctate; 1st tergum with sides parallel, converging slightly on apical fifth, the greatest width 0.8 times the median length; pygidium with greatest width (in middle) 0.8 times the length, the margins gently rounded outwardly, surface with large, subcontiguous punctures on basal two-thirds, shagreened elsewhere; 1st sternum with a low rounded median keel on basal third; 2nd sternum not raised at base; 6th sternum not greatly swollen posterolaterally; hypopygium at apex broadly and rather shallowly emarginate, the teeth acute but shorter than in preceding species.

The male paratype has tiny anterolateral and posterolateral spots on the second tergum, the third tergum has an apical band that covers the width of the sclerite laterally and narrows gradually to the center where it is about one-third the median length; it has quite narrow apical bands on the fourth to sixth terga, and a moderately large, transverse oval spot on each side of the second sternum.

Paratypes.—1 ♀, Milne Bay, Papua (TMA). 1 ♂, Wareo, Finschhafen, Morobe District, Territory of New Guinea, Rev. L. Wagner (SAM). 1 ♀, Wamena, West New Guinea, 1100 m, 10–25 February 1960, T. C. Maa (BPBM). 1 ♀, Kutsime, west of Swart Valley, West New Guinea, 1500 m, 14 November 1958, J. L. Gressitt (BPBM). Paratypes have been deposited in the collection of the United States National Museum.

10. *Cerceris minuscula* Turner

Typical *minuscula* is known only from Australia from whence I have seen material from Brisbane and Mackay in Queensland. Turner (1912, p. 677) records it also from Central Australia, and states that it is a very common species.

Cerceris minuscula is represented in Melanesia by three discrete new subspecies, *minuscula stanleyensis* from localities in the Owen Stanley Mountains, New Guinea, *m. sculleniana* from New Guinea, Bismarck Archipelago, and northern Solomns, and *m. korovensis* from Shortland Island in the Solomons. The first of these is known from females only; as in typical *minuscula* it is smaller and has more extensive pale yellow maculations, but the first tergum is black with yellow spots instead of being entirely red as in *minuscula*. The more widely ranging *m. sculleniana* is a larger form, similar in color pattern to *pictiventris immolator* Smith, but differing from that taxon in the absence of a raised platform at the base of the second sternum, the presence of a clypeal process in the female and of subbasal fimbriae on the fifth and sixth sterna of the male; it has fewer but brighter yellow markings than in *m. minuscula* and *m. stanleyensis*. The third taxon, *m. korovensis*, is known from a single male; it is less extensively maculated than *m. sculleniana* particularly on the abdomen.

10a. *Cerceris minuscula sculleniana*, new subspecies

FIGURE 11

HOLOTYPE.— ♀, Kokoda, Papua, 1200 ft, August 1933, L. E. Cheesman (BMNH).

Length 8 mm, forewing 6 mm. Black, rather dull, the following lemon yellow: basal half of mandible, clypeus except apical margin, face, band along inner eye margins extending upward to a level with top of interantennal prominence, scape beneath, lateral oval spot on dorsum of pronotum, spot on tegula, band on postscutellum, transverse band on basal third of 2nd tergum, band on 3rd tergum covering all of sides and apical margin narrowly in middle, a similarly shaped but narrower band on 5th tergum, apical band on 3rd sternum which is greatly narrowed in middle, mid and hind trochanters, all of fore and mid femora except blotch on basal half above, all of fore and mid tibiae, hind tibiae at base on outer surface, and fore and mid tarsi. The following are reddish: flagellum beneath, tegula except for yellow spot, narrow band at apex of 1st abdominal segment, and apical third of hind femur. Vestiture sparse, short, and silvery. Wings clear, but marginal cell and apex of forewing anteriorly infumated with brownish; stigma brown, veins testaceous.

Head (Figure 11) transversely oval in frontal aspect, the height (apex of clypeus to posterior ocelli) three-fourths the greatest width, the inner eye margins not converging above or below; inner margin of mandible with 2 separated, low rounded teeth in middle; apical margin of median lobe of clypeus gently and broadly emarginate and with 2 teeth laterad of this section; surface of clypeus with contiguous punctures, raised in the middle into a low, broad transverse process on the apical fourth, the process with a free edge which is broadly, obtusely emarginate; supraclypeal area flat; head closely and coarsely punctate except beneath; 2nd flagellar segment three-fourths as long as first.

Thorax coarsely and closely punctate except postscutellum, lateral surface of pronotum and metapleuron, the scutellum rather more sparsely punctate than scutum; tegula not inflated; postscutellum with small scattered punctures; anterior carina on lateral surface of pronotum not lamellate, nearly attaining the dorsal surface; mesopleuron not dentate or tuberculate; metapleuron with coarse oblique rugae; propodeal enclosure micropunctate, the median and lateral grooves finely crenulate, remainder of propodeum punctate like most of thorax except for the shallow concave area above abdominal attachment.

Comb of fore basitarsus with 6 spines; hind tibia with 6 serrations.

First abdominal tergum subquadrate, sides parallel except on apical fourth where they converge slightly, the surface coarsely and closely, and to some extent irregularly, punctate; 2nd to 5th terga coarsely, closely, and regularly punctate; pygidium rather narrow, the greatest width (just before middle) very slightly more than half the length, the surface irregularly wrinkled and with scattered, short suberect setae on basal half,

the sides rounded; 1st sternum with a low rounded keel on basal third; 2nd sternum not raised at base; 5th sternum not swollen laterally; hypopygium with apical teeth separated by a narrow U-shaped emargination, the lateral margin with a small acute tooth at apical third.

Female paratypes are 6–8 mm long. In the least brightly marked females the following are also black: base of clypeus, supraclypeal area, pronotum, yellow reduced on terga and entirely lacking on sternum, and trochanters and femora. Several specimens have the basal half of second sternum yellow and spots or a band on the third sternum.

ALLOTYPE.— ♂, same data as type but October 1933 (BMNH).

Length 6 mm, forewing 5 mm. Coloration similar to the female except as follows: 5th tergum black, the 6th yellow except narrowly at base, yellow spots at base and posterolaterally on 2nd sternum, and 3rd sternum with oval yellow spot on each side. Vestiture, wing color, and punctation also are essentially as de-described for the type.

Characters peculiar to the male are: head height 0.8 times its greatest width; inner eye margins converging below, the interocular distance across posterior ocelli 1.2 times this distance at intersection of epistomal suture and inner eye margin; clypeus gently convex, apical margin of median lobe tridentate and with a fimbria of curled, waxy-appearing hairs on lateral third; 1st flagellar segment slightly longer than 2nd; 1st tergum quite slender, the greatest width three-fourths the length; pygidium closely punctate, sides slightly rounded, greatest width three-fourths the length; 5th and 6th sterna with transverse subbasal fimbriae; hypopygium at apex broadly and rather shallowly emarginate, the lateral teeth short and acute.

Male paratypes vary in length from 6 to 9 mm, and have a forewing length of 4.5 to 6.5 mm. The vestiture, wing color, and punctation are not variable. Color variations of note are: fifth tergum occasionally entirely yellow; second sternum sometimes entirely black; and fore and mid femora occasionally entirely yellow.

PARATYPES.—Several have been deposited in the collection of the United States National Museum, and one male in the University of Minnesota.

Papua: 1♀, Kulumadau Hill, Woodlark Island, 16 February 1957, W. W. Brandt (BPBM). 1♂, K. B. Mission, Milne Bay, 26–28 March 1944, K. V. Krombein (KVK). 1♀, Port Moresby, 13 May 1959, C. D. Michener (BPBM). 1♀, 9♂, Kokoda, 1200 ft, April (5♂), June (♂), August (♀, 2♂), and September (♂) 1933, L. E. Cheesman (BMNH). 1♀, 2♂, Mondo, 5000 ft, L. E. Cheesman (BMNH).

Territory of New Guinea: 2♂, Nadzab, Markham River Valley, 25 August 1944, U. N. Lanham (KVK). 1♂, Sattelberg, Huon Gulf, 1900, Biro (TMA). 3♂, Friedrich-Wilhelmshafen, 1901, Biro (TMA). 2♀, Torricelli Mountains, 200–1000 ft, January 1939, L. E. Cheesman (SAM). 1♀, Goroka, 1650 m, 14 May 1966, J. L. Gressitt, in Malaise trap (BPBM). 1♀, Mt. Hagen area, 1650 m, 28 June 1957, D. E. Hardy (BPBM).

West New Guinea: 1♂, Genjam, 40 km west of Hollandia, 100–200 m, 1–10 March 1960, T. C. Maa (BPBM). 1♂, Kebar Valley, west of Manokwari, Vogelkop, 550 m, 4–31 January 1962, L. W. Quate (BPBM).

Bismarck Archipelago: 1♀, Nusa Island, 24 May 1900, Biro (TMA). 1♀, Kandan, New Ireland, 1 January 1960, W. W. Brandt (BPBM).

Solomon Islands: 1♂, Buka airstrip, Buka Island, 21 July 1959, J. L. Gressitt (BPBM).

It is probable that like *venusta oceanica*, this taxon is an inhabitant of savannah areas. Many of the specimens bear label data identical with those on specimens of *v. oceanica*.

10b. *Cerceris minuscula stanleyensis*, new subspecies

HOLOTYPE.— ♀, Bisianumu, 40 km northeast of Port Moresby, Papua, 500 m, 24 September 1955, J. L. Gressitt (BPBM).

Length 6.5 mm, forewing 4.5 mm. Black, the following pale yellow: basal two-thirds of mandible, clypeus, supraclypeal area and interantennal lamella, side of front up to top of interantennal lamella, antenna beneath, small spot adjacent to mandible and lower posterior eye margin, large, narrowly interrupted spots on pronotal dorsum and scutellum, tegula except margins, postscutellum, a pair of large oval spots on dorsal and posterior surfaces of propodeum, small posterolateral spot on 1st tergum, basal two-fifths of 2nd tergum, posterior half of 3rd and 5th terga, basal three-fifths of 2nd sternum, apical half of 3rd sternum, all trochanters, fore and mid tibiae and tarsi, and hind tibia beneath; the following reddish—apical third of mandible, apex of clypeal process, margins of tegula, pygidium, and apex of hind femur.

Body ratios and sculpture as in *minuscula sculleniana.*

MALE.—Unknown.

PARATYPE.— ♀, Goilala-Tororo, Owen Stanley Range, Papua, 1560 m, 21–24 February 1958, W. W. Brandt (BPBM). The paratype has been placed in the United States National Museum.

10c. *Cerceris minuscula korovensis*, new subspecies

This subspecies of the central Solomons, known only from a single male, is distinguished from *m. sculleniana* of eastern New Guinea, Bismarck Archipelago, and northern Solomons by the comparatively reduced yellow markings as noted in the foregoing key.

TYPE.— ♂, Korovo, Shortland Island, Solomons, 28 April 1934, H. T. Pagden, #1237 (BMNH).

Length 6.7 mm, forewing 5 mm. Black; the following yellow—mandible except tip, clypeus except apical margin narrowly, supraclypeal area, band along inner eye margins extending to top of interantennal prominence, scape, a pair of small rounded spots on pronotal dorsum, small spot on tegula, band on postscutellum, small spot at base of 2nd tergum, large spot on each side of 3rd, and legs as in *m. sculleniana*; the following reddish—flagellum beneath, most of tegula, and apical third of hind femur.

Sculpture and body proportions as in *m. sculleniana,* except that the last two sterna lack coarse punctures, and the last three terga have slightly sparser punctures.

FEMALE.—Unknown.

11. *Cerceris vechti*, new species

FIGURE 12

The close relationship between *vechti* and *venusta* is apparent in the broadened head, convergent inner eye margins above, and basic similarity in the shape of the clypeal process. These characters serve to separate these two taxa from any others occurring in the Melanesian region. The male of *vechti* is unknown; presumably it will agree with *venusta* males in lacking fimbriae on the fifth and sixth sterna and in the presence of a lateral fimbria of waxy-appearing, curled hairs on the apical margin of the clypeus.

HOLOTYPE.— ♀, Karimui, south of Goroka, New Guinea (NE), 1000 m, 5 June 1961, J. L. and M. Gressit (BPBM).

Length 11.5 mm, forewing 9 mm. Black, the following yellow: basal two-thirds of mandible, clypeus except apical margin, process beneath and base of median lobe, side of face broadly on lower half and narrowing above to a point opposite top of antennal insertion, interantennal lamella, small round spot behind eye, scape beneath, outer margin of tegula, band on postscutellum, 1st tergum with a short band on posterior half of side and a narrow subapical band, short posterolateral stripe on 2nd tergum, narrow apical band on 4th tergum, extremely narrow apical streak on 5th tergum, oblique, ovate spot on each side of posterior two-thirds of 1st sternum, all tibiae beneath, and fore and mid tibiae anteriorly. The following are ferruginous: flagellum beneath, apical half of pygidium and fore tarsus. Legs instead of being black elsewhere range from castaneous to reddish. Vestiture short, moderately dense, light brown to cinereous. Forewing with anterior margin moderately infumated in marginal cell and beyond, stigma dark brown, the veins lighter brown.

Head (Figure 12) broad, its greatest width 1.4 times its height (apex of clypeus to posterior ocelli); inner eye margins distinctly converging above, interocular distance across posterior ocelli 0.9 times that at intersection of epistomal suture and inner eye margin; inner margin of mandible with 2 blunt teeth on middle third; median third of apical margin of clypeus with 5 equidistant teeth; median lobe of clypeus with a moderately high process which is broader than long, conical in profile, the apical edge forming a continuous lamina which has an inner pair of acute, narrowly separated teeth in middle and outer pair lying just above clypeal margin; supraclypeal area slightly convex; 2nd flagellar segment 0.75 times as long as first.

Pronotal dorsum, scutum, and scutellum with subcontiguous coarse punctures; postscutellum with smaller, sparser punctures; tegula not inflated, with numerous small and a few larger, interspersed punctures; anterior carina on lateral pronotal surface not lamellate, extending upward to but not upon dorsal surface; mesopleuron with very coarse, contiguous punctures; metapleuron with fine, oblique rugae; propodeal enclosure with a weakly crenulate median groove, several large punctures anterolaterally, the remainder of surface delicately roughened; remainder of propodeum with punctation similar to that on scutum.

Comb of fore basitarsus with 9 spines; hind tibia with 6 serrations.

First to 5th terga more or less coarsely and contiguously punctate; 1st tergum subquadrate, the sides

rounded; pygidium barrel-shaped, broader than in *venusta,* the greatest width two-thirds the length, the anterior two-thirds strongly and irregularly wrinkled and with suberect sparse setae, the posterior third very delicately wrinkled; 1st sternum with a low rounded keel on basal half; 2nd sternum without a raised semicircular area at base, anterolaterally with a large, slightly deeper concavity than in *venusta;* 5th sternum slightly swollen posterolaterally; hypopygium with apical teeth separated by a narrow U-shaped emargination, the lateral margin with a small acute tooth near middle.

MALE.—Unknown.

Paratypes.— 1 ♀ ; same data as holotype but 2 June 1961 (BPBM). 1 ♀, Kiunga, Fly River, Papua, 26–30 1957, W. W. Brandt (BPBM). The latter specimen has been deposited in the United States National Museum. The paratypes are 11–11.5 mm long and agree very well with the holotype in color and sculpture. One specimen has ten basitarsal spines and both have seven serrations on the hind femur. The Kiunga specimen lacks lateral spots on the first tergum and the narrow streak on the fifth tergum.

12. *Cerceris venusta* Smith

Typical *venusta* Smith (1873, p. 413) occurs in Australia, where, apparently, it is found only in Queensland. Turner (1912, p. 674) notes that it is one of the commonest species in north Queensland. I have seen specimens from Townsville, Mackay, Stradbroke Island, and Brisbane. The nominate subspecies from Australia differs from the taxa occurring in the Melanesian region by the increased amount of yellow markings, the fourth and fifth terga in the female and fourth through sixth in the male being almost or entirely yellow. Turner (*op. cit.*) notes that specimens from Cairns have reduced yellow markings; these may actually be the Melanesian *venusta oceanica* Brèthes, which is known from New Guinea east of 146° and from Prince of Wales Island on Cape York Peninsula.

The closest relative of *venusta* is *vechti,* new species, from New Guinea, which has basically the same kind of clypeal process, a similarly shaped head, and the inner eye margins strongly convergent above. The two species are readily separated by differences in the dentition of the clypeal margin and shape of the clypeal process.

In the Melanesian region *venusta* is represented by three races: *venusta oceanica Brèthes,* from Prince of Wales Island and New Guinea east of 146° which has lesser yellow markings than in typical *venusta; venusta atrescens,* new subspecies, a very dark form from New Guinea west of 146°; and *venusta keiensis* Strand from Kei and Aru Islands which is intermediate in coloration between the two subspecies from New Guinea.

There are no known prey records for any of the Melanesian subspecies. A female of typical *venusta* from Stradbroke Island (USNM) is mounted with its prey, an adult scarabaeid, *Deuterocaulobius maechidioides* MacLeay (determined by E. A. Chapin).

12a. *Cerceris venusta oceanica* Brèthes, new status

FIGURE 13

Cerceris oceanica Brèthes, 1920, p. 411.

Cerceris insulicola Tsuneki, 1968a, p. 27. NEW SYNONYMY.

Brèthes' description of this taxon was brought to my attention by Dr. Arnold Menke after this revision had been set in galleys; for some reason it was never cataloged in the *Zoological Record.* Thus, I have not had an opportunity to ascertain the type depository nor to obtain any information on the holotype. It was described from a single male from Yule Island along the southeast coast of New Guinea, a short distance west of Port Moresby, Papua. Fortunately, the original description is detailed enough so there can be no question as to the identity of *oceanica.* The presence of four yellow spots on the vertex is diagnostic of the taxon I treat here as *venusta oceanica;* it is the only Melanesian *Cerceris* with these distinctive markings.

Tsuneki's type series of *insulicola* from Prince of Wales Island at the tip of Cape York Peninsula, Australia, is before me. It is identical with *venusta oceanica* which has a wide range in New Guinea east of 146°. In describing *insulicola* from males only, Tsuneki questioned whether it was possibly the opposite sex of *venusta.* His conjecture was correct except that *insulicola* represents a discrete subspecies.

FEMALE.—Length, 9–11.5 mm, forewing 7–9.5 mm. Black, the following yellow: mandible except apex, clypeus, broad quadrate mark somewhat narrowed above along inner eye margin and extending from clypeus upward to a point halfway between antennal insertions and anterior ocellus, narrow streak along interantennal lamella ending just before anterior ocellus, antennal scape beneath, an oblique oval spot on

each side of vertex, a narrow stripe occasionally reduced to a spot on temple along outer margin ending on top of head so that viewed from above the back of the head has 4 yellow spots, large quadrate spots on pronotal dorsum narrowly separated in middle, tegula except margins, transverse bands on scutellum and postscutellum, small rounded spot on upper part of mesopleuron, propodeum with a pair of large rounded spots principally on dorsal and posterior aspects (enclosure black), a pair of small lateral spots on 1st tergum, a pair of large rounded posterolateral spots on 2nd tergum, occasionally extending on sides almost to anterior margin, an extremely narrow apical band on 3rd tergum, broader apical bands on 4th and 5th terga which narrow gradually toward middle, a small spot on each side of the 6th tergum adjacent to pygidium, coxae beneath at apices, trochanters beneath, fore and mid femora with stripes beneath, and outer surface of fore and mid tibiae and tarsi. The following are ferruginous: scape except beneath, pedicel and first 3 flagellar segments entirely, rest of antenna beneath, tegula on margins, apex of 1st tergum, posterior half of 2nd tergum between the yellow spots, pygidium, 2nd and 6th sterna, broad transverse bands on intervening sterna, and legs except as noted above and except for some small infuscated streaks on hind femur and tibia. Vestiture short, light brown above, silvery on head and thorax beneath, and on sides of latter. Forewing with anterior margin infumated moderately, stigma yellow, and veins testaceous.

Head (Figure 13) dull, broad, its greatest width 1.5 times its height (apex of clypeus to posterior ocelli), inner eye margins distinctly converging above, the interocular distance at posterior ocelli 0.83 times that at intersection of epistomal suture and inner eye margin; inner margin of mandible with 2 blunt, well-separated teeth on middle third; apical margin of median lobe of clypeus broadly and shallowly emarginate with a small tooth at lateral fourth and another one a short distance laterad of the 1st; surface of clypeus with large subcontiguous punctures and numerous minute ones on the interspaces, the median lobe with a low process, conical when viewed from the side, the apical edge of the process forming a complete arcuate lamina; supraclypeal area slightly convex; rest of head except ventrally with contiguous punctures; 2nd flagellar segment slightly shorter (0.8) than 1st.

Thorax dull; pronotal dorsum, scutum, and scutellum with subcontiguous coarse punctures; tegula not inflated, with numerous small punctures; postscutellum with smaller, sparser punctures; anterior carina on lateral surface of pronotum not lamellate, attaining the dorsal surface but not extending onto it; mesopleuron with coarse contiguous punctures, not dentate or tuberculate; metapleuron with close oblique rugae except for a small punctate area above hind coxa; propodeal enclosure with some very short longitudinal rugae at base, a moderately deep, crenulate median groove, several large punctures along lateral impressed lines, the remainder of surface finely roughened; propodeum elsewhere coarsely and subcontiguously punctate, the concave area above attachment shallow, with 2 carinae gently arched outwardly on each side of midline.

Comb of fore basitarsus with 7 to 8 spines; hind tibia with 6 serrations.

Abdomen shining; 1st tergum subquadrate, sides rounded, the base slightly wider than apex, the surface with subcontiguous punctures; 2nd to 5th terga with similar punctures, the 4th slightly more sparsely so; pygidium barrel-shaped, the length half again as great as width, the surface strongly and irregularly wrinkled, with suberect sparse setae on basal half; 1st sternum with a rounded median keel on basal half; 2nd sternum not raised into a semicircular area at base, anterolaterally with a large, very shallow concavity; 5th sternum not greatly swollen posterolaterally; hypopygium with apical teeth separated by a narrow U-shaped emargination, the lateral margin with a small acute tooth at middle.

MALE.—Length 7.5–11 mm, forewing 5.5–9 mm. Coloration similar to female except as follows: supraclypeal area occasionally yellow, vertexal spots tiny, temple with a spot above instead of a stripe, scutellar band occasionally interrupted, 3rd tergum occasionally immaculate, 6th tergum with an apical band, and 7th tergum with a lateral spot on each side adjacent to pygidium. Vestiture, wing color, and punctation also are essentially the same as described for the female.

Characters peculiar to the male are: head height 0.8 times the greatest width; eyes not convergent above or below, the interocular distances (as cited for female) subequal; clypeus gently convex, the apical margin of median lobe feebly tridentate, the apical margin with a fimbria of curled, waxy-appearing hairs on lateral third; pygidium with sides parallel except at extreme base where they turn inward, the length 1.2 times the greatest width, the surface coarsely punctate, closely on basal two-thirds, more sparsely on apical third, the interspaces

shagreened; sterna 5 and 6 without subbasal fimbriae; and hypopygium semicircularly emarginate at apex, the lateral teeth acute and slender.

Australia: 7♂, Prince of Wales Island, 14 February 1939, R. G. and C. Wind (USNM, the type series of *insulicola* Tsuneki).

Papua: 1♂, Kulumadau Hill, Woodlark Island, 25 February 1957, W. W. Brandt (BPBM). 2♀, K. B. Mission, Milne Bay, 6–17 and 19 March 1944, K. V. Krombein (KVK). 1♀, Waigani, Port Moresby, December 1942, W. G. Bodenstein (KVK). 1♂, Port Moresby, 13 May 1959, C. D. Michener (BPBM). 1♀, Otomata Plantation, east of Port Moresby, 1 m, 2 November 1960, J. L. Gressitt, in Malaise trap (BPBM). 1♀, Brown River, 5 November 1960, J. L. Gressitt, in rain forest (BPBM). 3♀, 15♂, Kokoda, 1200 ft, April (♀, 9♂), May (♂), August (2♀, 3♂), and September (2♂), 1933, L. E. Cheesman (BMNH). 1♂, Oquali, 4500 ft, July 1933, L. E. Cheesman (BMNH). 1♂, Kapagere, near Rigo, 14–19 May 1959, C. D. Michener (BPBM). 1♀, Mt. Lamington, May 1927, C. T. McNamara (AM). 1♀, Inonda, Horanda District, 8 December 1943, W. G. Bodenstein, (KVK).

Territory of New Guinea: 1♀, 4♂, Nadzab, Markham River Valley, 24 (♀, 3♂) and 27 (♂) August 1944, U. N. Lanham (KVK). 1♀, same locality but 9 December 1944, D. G. Hall (USNM).

The two specimens which I caught were taken in partial-to-open cleared areas, indicating that this is possibly a grassland or savannah form.

12b. *Cerceris venusta keiensis* Strand, new status

Cerceris venusta Smith var. *keiensis* Strand, 1911, p. 232.

Strand described this distinctive taxon from the Kei Islands as a variety, but it is quite clearly a discrete subspecies. I have seen specimens from both Kei and Aru Islands. It has fewer yellow markings than *venusta oceanica* Brèthes from eastern New Guinea, but it is not so melanic as *venusta atrescens,* new subspecies, from western New Guinea. The lateral lobe of the clypeus in *keiensis* is nearly devoid of punctures as in *atrescens*. In the female yellow markings are lacking on the mesopleuron, propodeum, and third tergum; in the male the vertex has only the outer pair of yellow spots, and the propodeum and third tergum are entirely black.

FEMALE.—Length 12 mm, forewing 9.5 mm. Black, the following yellow: mandible except apex, clypeus except base of median lobe, broad quadrate mark on side of face narrowing slightly above and terminating opposite top of interantennal lamella, streak on interantennal lamella, 4 rounded spots across vertex, the outer pair larger, scape beneath, short lateral spot on pronotal disk, lateral spots on scutellum, band on postscutellum, broad band across middle of 1st tergum, subapical band on 2nd tergum narrowly interrupted on midline, apical bands on posterior third of 4th tergum and posterior fourth of 5th tergum, exposed parts of 1st and 5th sterna, and stripe anteriorly on fore tibia. The following are ferruginous: scape above, flagellum beneath, tegula, apex of 1st tergum, pygidium, and legs.

Sculpture much as in *venusta oceanica* except lateral lobes of clypeus almost devoid of large punctures.

Male.—Length 10–11.5 mm, forewing 8–9 mm. Black, the following yellow: mandible except apex, clypeus except occasionally base of median lobe, large quadrate mark on side of face narrowing slightly above and terminating opposite top of interantennal lamella, streak on interantennal lamella, tiny spot on vertex behind eye, scape beneath, lateral spot on pronotal disk, scutellum rarely with spots, postscutellum with band, occasionally narrow stripe across middle of 1st tergum, subapical band on 2nd tergum occasionally interrupted in middle, narrow apical bands on 4th to 6th terga, exposed parts of 1st and 2nd, and occasionally of 3rd to 6th sterna, and stripe on outer surface of fore and mid tibiae. The following are ferruginous: scape above, flagellum beneath, tegula, apical third or half of 1st tergum, pygidium, and legs.

Kei Islands: 1 ♂, Toeal, 1922, H. C. Siebers (JvdV). 1 ♂, Ohoider, Kl. Kei, 1922, H. C. Siebers (JvdV). 1 ♀, 1 ♂, Kei Islands (TMA).

Aru Islands: 1 ♂, Aru Islands, Rosenberg (JvdV).

12c. *Cerceris venusta atrescens,* new subspecies

This form from western New Guinea is characterized by a substantial reduction in the number and extent of the yellow markings.

HOLOTYPE.— ♀, Suanimbu, 20 kilometers east of Maprik, Western Highlands District, Territory of New Guinea, 180 m, 14 January 1960, T. C. Maa (BPBM).

Length 12 mm, forewing 9.3 mm. Black, the following pale yellow—mandible except apex, clypeus except anterior margin and margin of lamina, subrectangular spot along inner eye margin extending a bit above level of antennal insertions, scape beneath, interantennal

prominence, small spot above behind eye, band on postscutellum, tiny posterolateral spot on 1st tergum, larger posterolateral spots on 2nd and 3rd terga, band on 4th tergum narrowly interrupted and divided into thirds, smaller posterolateral spots on 5th tergum, outer surfaces of fore and mid tibiae and fore tarsus; the following reddish—flagellum beneath, margins of tegula, all femora, fore and mid tibiae and fore tarsus beneath, and mid tarsus.

Sculpture similar to that of *v. oceanica* except that lateral lobes of clypeus are nearly devoid of larger punctures, and that the punctures on dorsum of head, thorax, and abdomen are a bit larger and deeper; comb of fore basitarsus composed of 9 spines on one side, 10 on the other; hind tibia with 6 serrations.

ALLOTYPE.— ♂, Mt. Hagen, Western Highlands District, Territory of New Guinea, 1600 m, 23 May 1961, J. L. & M. Gressitt, in light trap (BPBM).

Length 9 mm, forewing 7.5 mm. Color pattern as detailed for female except pronotum has a small lateral yellow spot, the 1st, 2nd, 4th, and 5th terga have yellow apical bands, and the legs are not ferruginous.

Sculpture as in *venusta oceanica* except the punctures larger and deeper.

PARATYPES.—1 ♀, Hollandia, West New Guinea, June 1937, W. Stüber (RNH). 1 ♂, Kumun, upper Jimmi Valley, Western Highlands District, Territory of New Guinea, 1000 m, 13 July 1955, J. L. Gressitt (BPBM). 1 ♂, Wau, Morobe District, Territory of New Guinea, 1200 m, 16 June 1961, J. Sedlacek (BPBM). Paratypes have been placed in the collection of the United States National Museum.

The female paratype is similar to the holotype in size and coloration, but the femora are black and the band on the fourth tergum is narrowly interrupted in the middle. The male paratype from Wau is quite like the allotype in coloration except that the first and second terga have the yellow bands reduced to posterolateral spots. The male paratype from Kumun has the scape, thorax, and abdomen entirely black and lacks the small yellow spot behind the eye.

13. *Cerceris mordax*, new species

FIGURE 14

This species, known only from the female, is quite distinct in the Melanesian fauna because of the mandibular dentition, no other species having two such large blunt teeth on the apical half of the inner margin of the mandible. It is further distinct among those species having a narrow erect clypeal process in that the inner eye margins are not convergent above. So far, it is known only from the Port Moresby area which suggests that it may be represented in Queensland by a discrete subspecies.

HOLOTYPE.— ♀, Laloki, Central District, Papua, 24 April 1959, C. D. Michener (BPBM).

Length 12 mm, forewing 9 mm. Black, the following yellow: mandible except margins of teeth, clypeus except apical margin narrowly and apex of process, middle of supraclypeal area, interantennal lamella, side of face broadly to level of top of interantennal lamella, rectangular mark behind eye above, scape, large lateral mark on pronotal dorsum, tegula except margins, transverse spot on scutellum, band on postscutellum, basal two-fifths of 2nd tergum, 3rd tergum except semicircular spot in middle of base, 5th tergum except for a larger basal spot that extends narrowly to side, fore and mid femora beneath, and all tibiae above. The following are ferruginous: margins of mandibular teeth and clypeal process, flagellum beneath, margins of tegula, 2nd and 3rd sterna, and legs except coxae and the yellow areas on femora and tibiae. Vestiture sparse and short, cinereous above, silvery on sides of thorax. Wings clear, the marginal cell and apex of forewing slightly infumated, stigma and veins light brown.

Head (Figure 14) transversely rounded in frontal aspect, the height (apex of clypeus to posterior ocelli) 0.65 times the width; inner eye margins not converging above or below; inner margin of mandible with 2 very large blunt teeth on apical half; middle third of apical margin of clypeus slightly produced, broadly rounded, weakly dentate at lateral angle; clypeal process erect, about as broad as long, the apex slightly emarginate; supraclypeal area convex; front and vertex contiguously punctate, the temples similarly punctate except becoming rugosopunctate below; 2nd flagellar segment 0.75 times as long as 1st.

Thorax coarsely and contiguously to subcontiguously punctate except postscutellum, propodeal enclosure, and metapleuron; anterior carina on lateral surface of pronotum not extending upward to dorsum; tegula not inflated; postscutellum with scattered small punctures; upper half of metapleuron with close oblique rugae, the lower half micropunctate; propodeal enclosure with a shallow median crenulate groove, anterolaterally rugosopunctate, the surface elsewhere shagreened.

Comb of fore basitarsus with 9 to 10 spines; hind tibia worn, only 6 serrations visible.

First tergum 0.6 times as long as wide, the sides slightly rounded, contiguously punctate; 2nd to 5th terga with subcontiguous punctures; pygidium with sides rounded, apex a bit narrower than base, the width two-thirds the length, the surface rather worn but apparently originally closely punctate; basal half of 1st sternum with a low rounded keel; 2nd sternum flat at base, 5th sternum not swollen laterally; hypopygium with apical teeth separated by a narrow U-shaped emargination, lateral margin with a small acute tooth adjacent to apical tooth.

MALE.—Unknown.

PARATYPE.— ♀, Port Moresby, Papua, New Guinea, 13 May 1959, C. D. Michener (BPBM), deposited in United States National Museum.

The paratype is only 9 mm long. It is cyanided, so that all of the pale markings appear to be light ferruginous. The color pattern otherwise is exactly the same except that the entire supraclypeal area is pale. The apex of the clypeal process is more weakly emarginate than in the holotype. The hind tibia has six serrations and the pygidium is closely punctate.

14. *Cerceris toxopeusi*, new species

FIGURE 15

The present species, also known from a single female, is immediately distinguished from all others occurring in this area by the large vertical lamellate tooth on mesopleuron and the dentition of the apical margin of the median lobe of the clypeus. It is not at all closely related to *C. sepulcralis* Smith, 1857, from Borneo, which has a similarly shaped mesopleural tooth. It is most likely that the male will be found to lack the mesopleural tooth.

HOLOTYPE.— ♀, Hollandia, West New Guinea, July 1938, L. J. Toxopeus (RNH).

Length 14 mm, forewing 11.5 mm. Black, rather dull except dorsum, the following yellow: mandible except apical third, clypeus except apical margin narrowly, basal and apical thirds of process above and process entirely beneath, a broad trapezoidal mark along inner eye margin extending upward almost to level of interantennal prominence, narrow streak on latter, spot behind eye above and another smaller one on temple near lower end of eye, an oval spot laterally on pronotal dorsum, small spot on tegula, band on postscutellum, transverse band on basal third of 2nd tergum, and fore and mid tibiae and tarsi above. The following are reddish: flagellum beneath, and fore and mid tibiae beneath. Vestiture short and silvery, brownish above on abdomen. Wings infumated with brownish, the marginal cell and apex anteriorly of forewing more strongly so, stigma and veins dark brown.

Head (Figure 15) transversely oval, the height (apex of clypeus to posterior ocelli) 0.7 times the width; inner eye margins converging above, the interocular distance across posterior ocelli 0.85 times that at intersection of epistomal suture and inner eye margins; mandible in middle with a single large tooth; apical margin of clypeus in middle with a narrow projection which is notched in middle, and a strong tooth on each side about one-third the distance to lateral margin of clypeus; surface of clypeus densely micropunctate and with scattered larger punctures, in middle with a projecting process with parallel sides and shallowly emarginate free apical margin, the process about as broad as long; supraclypeal area convex; face and front with close, contiguous, moderately large punctures, the vertex and temples less closely punctured; 2nd flagellar segment slightly shorter (0.8) than 1st.

Pronotal dorsum with coarse, contiguous punctures; scutum with punctures of equal size which are sparser on posterior half in middle; scutellum also less closely punctate; postscutellum with small, moderately close punctures; anterior carina on lateral surface of pronotum not lamellate, extending onto dorsal surface one-third of distance to middle; mesopleuron with a large vertical lamellate tooth below, the surface before this tooth vertically rugosopunctate, behind it punctate only; metapleuron with close oblique rugae; propodeal enclosure with very short radiating rugae at base, median groove finely crenulate, lateral grooves more strongly crenulate, the rest of surface densely micropunctate; rest of propodeum with coarse contiguous punctures except for shallow concave area above abdominal attachment which has several fine, close carinae on either side of midline curving outwardly above and below.

Comb of fore basitarsus composed of 10 spines; hind tibia with 7 serrations.

First tergum subquadrate, the length slightly more than greatest width, the sides parallel except on apical fourth where they converge slightly, the surface with moderately large, contiguous punctures; 2nd to 5th

terga similarly punctured; pygidium rather short, the length 1.4 times the greatest width (just before middle), the sides rounded and converging posteriorly to the truncate tip, the posterior half finely, closely, and irregularly wrinkled, the anterior half closely and coarsely punctate and with more numerous (than usual) coarse, short suberect setae; 1st sternum with a low rounded keel on basal third; 2nd sternum somewhat raised at base but not abruptly declivous posteriorly: 5th sternum not swollen posteriorly; hypopygium with apical teeth separated by a U-shaped emargination, the lateral margin with a strong acute tooth at apical third.

MALE.—Unknown.

15. *Cerceris vellensis*, new species

This polytypic species of the Solomons is represented by four subspecies from Vella Lavella, Santa Ysabel, New Georgia, and Bougainville. The very slender form distinguishes it at once from any of the other species in the area covered by this revision, and the conformation of the clypeal process and apical margin of the clypeus are also diagnostic.

Two of the polytypic species of *Cerceris* occurring in the Solomons, *bougainvillensis* and *vellensis*, exhibit an interesting parallel development of homoeochromic analogues. Both have subspecies on New Georgia that are largely melanic with a few ivory colored markings, both have subspecies on Vella Lavella that are brightly and extensively maculated with lemon yellow and that have a fair amount of reddish integument, and both have subspecies on Bougainville that lack the red markings and are intermediate between the Vella Lavella and New Georgia forms in the extent of yellow or ivory markings.

15a. *Cerceris vellensis vellensis*, new subspecies

FIGURE 16

This subspecies, known from a single female, is closer to *v. fordi* than to *v. segiensis* in having more extensive yellow markings. It is distinguished from *v. fordi* by having red rather than black integument on the antennae, legs, and first abdominal segment, and also in having yellow markings on the scutellum and first abdominal segment.

HOLOTYPE.— ♀, Vella Lavella, Solomon Islands, 12–20 October 1943, P. D. Hurd (USNM type 70125).

Length 11 mm, forewing 9 mm. Black, rather dull, the following lemon yellow: mandible except apical third, clypeus except apical margin and apex of process, small spot on supraclypeal area extending upward as a narrow streak on interantennal lamella, broad mark along inner eye margin extending upward to slightly above the level of top of interantennal prominence, scape, transverse band on pronotal dorsum narrowly interrupted in middle, tegula except margins, bands on scutellum and postscutellum, small spot on mesopleuron beneath forewing, a pair of large rounded spots on posterior surface of propodeum, streak along side of 1st tergum, transverse band on basal third of 2nd tergum and narrower apical band, the two almost meeting laterally, apical band on 3rd tergum which covers most of sides and the apical margin narrowly in middle, small transverse spot posteriorly on 5th tergum, apical two-thirds of 1st sternum, narrow streak along side of 2nd sternum, posterolateral spot on 3rd sternum, outer surface of fore and mid tibiae, and small spot at base on outer surface of hind tibia. The following are reddish: flagellum, margins of tegula, apex of 1st tergum, and legs except for yellow markings. Vestiture short and brownish except silvery on clypeus. Wings slightly infumated except more strongly so in marginal cell and apex anteriorly of forewing, the stigma and most of veins testaceous.

Head (Figure 16) transversely oval, the height 0.7 times the width, the inner eye margins converging slightly above; inner margin of mandible with a strong obtuse tooth just beyond middle; apical margin of clypeus with a narrow truncate section in middle, then a shallow emargination which is a little wider and then a small blunt tooth at the edge of the median lobe; surface of clypeus densely micropunctate and with some scattered larger punctures, the process narrow and erect, with a free apical edge which is angulately emarginate; face with moderately large, subcontiguous punctures; supraclypeal area convex; front longitudinally rugosopunctate; vertex and temples with moderately large, subcontiguous punctures; 2nd flagellar segment 0.8 times as long as 1st.

Pronotal dorsum, scutum, and scutellum with large, subcontiguous punctures; tegula not inflated; postscutellum densely micropunctate and with a few scattered larger punctures; anterior carina on lateral surface of pronotum not lamellate, extending onto dorsum a fourth the distance to center; mesopleuron obliquely and coarsely rugosopunctate, not dentate or tuberculate; metapleuron closely and obliquely rugose except

a small area above hind coxa which is shagreened; propodeal enclosure with a few oblique rugae at extreme base, median and lateral grooves crenulate, the rest of surface densely micropunctate; propodeum elsewhere with large, contiguous punctures except concave area above abdominal attachment which has a strong central carina and a weaker one on each side of the central.

Comb of fore basitarsus with 7 spines on one side, 8 on the other; hind tibia with 7 serrations on one side, 8 on the other.

First tergum 1.7 times as long as greatest width, the sides suddenly constricted at stigmata and then parallel nearly to apex where they converge slightly, the surface with large, subcontiguous to more separated punctures; 2nd and 3rd terga subcontiguously punctured, the 4th and 5th not quite so closely; pygidium with sides rounding, apex narrowly truncate, about 1.6 times as long as greatest width (just before middle), the surface with coarse, irregular wrinkles on basal two-thirds, the apical third smooth, scarcely any setae near base; 1st sternum with a low rounded keel on basal third; 2nd sternum convex at base; 5th sternum not swollen laterally; hypopygium with apical teeth separated by a U-shaped emargination, lateral margin with a small acute tooth at apical third.

MALE.—Unknown.

15b. *Cerceris vellensis obrieni*, new subspecies

This subspecies from Santa Ysabel is very similar to *v. fordi* from Bougainville and Buka in the general extent and pattern of the yellow markings. Females of *v. obrieni* have red and yellow legs whereas those of *v. fordi* are black and yellow; in males of *v. obrieni* only the hind femur and tibia have some reddish areas. Males of the two subspecies differ otherwise in that *v. fordi* almost always has four small yellow spots on the second tergum, two anteriorly nearly joined and a pair of posterolateral ones; in *v. obrieni* the anterior spots are fused into a larger single one and the posterolateral pair is lacking.

HOLOTYPE.— ♀, Molao, Santa Ysabel, Solomon Islands, 30 June 1960, C. W. O'Brien (BPBM).

Length 10.5 mm, forewing 9 mm. Black, the following yellow: basal two-thirds of mandible, clypeus, broad mark along inner eye margin to top of interantennal lamella, scape beneath, pronotal disk except median third, band on postscutellum, a pair of small round spots on posterior surface of propodeum, narrow apical band on 1st tergum, large yellow spot anteriorly on 2nd tergum and small posterolateral spot, apical band on 3rd tergum widened at sides and narrowed toward middle, and outer surface of fore tibia. The following light red: scape above, flagellum beneath, tegula, and legs except coxae and outer surface of fore tibia.

Sculpture and proportions as in *v. fordi.*

ALLOTYPE.— ♂, same data as holotype (BPBM).

Length 9.5 mm, forewing 8 mm. Coloration as in holotype except as follows: base of clypeus black, yellow band on 3rd tergum narrowly divided in middle, mid and hind trochanters yellow, fore and mid femora with an apical yellow spot, fore and mid tibiae and tarsi yellow, hind femur red at apex, and hind tibia red at base and apex, legs otherwise black.

Sculpture and proportions as in *v. fordi.*

PARATYPES.—3 ♀, 10 ♂, same data as holotype, (BPBM). 1 ♀, Tamatahi, Santa Ysabel, 450 m, 3 July 1960, C. W. O'Brien (BPBM). Paratypes have been placed in the United States National Museum, the British Museum (Natural History), and one male in the University of Minnesota.

Female paratypes are 9–10.5 mm long and are like the holotype in coloration except that the apical band on first tergum is reddish. Male paratypes are 8–10 mm long; several have the median spot on the second tergum almost divided into two along the midline, and several have a tiny posterolateral spot on that sclerite.

15c. *Cerceris vellensis fordi*, new subspecies

HOLOTYPE.— ♀, Kokura, southern Bougainville, Solomon Islands, 690 m, 17 June 1956, E. J. Ford, Jr. (BPBM).

Length 12 mm, forewing 10 mm. Black, the following lemon yellow: mandible except apical third, clypeus except apical margin and apex of process, small spot on supraclypeal area extending onto interantennal lamella, broad mark along inner eye margin extending to upper level of interantennal lamella, flagellum beneath, lateral spot on pronotal dorsum, tegula except margins, band on postscutellum, a pair of small rounded spots on posterior surface of propodeum, paired spots at base and smaller posterolateral spot on 2nd tergum, band at apex of 3rd tergum wider at sides and narrowly interrupted in middle, small posterolateral spot on 3rd sternum, extreme apex of fore and mid femora, all of fore and mid tibiae and tarsi, hind trochanter and small spot near base of hind tibia. Vestiture and wings

as in *v. vellensis* except that stigma and veins are dark brown.

Sculpture and proportions as in *v. vellensis*.

ALLOTYPE.— ♂, same data as type but 8 June 1956 (BPBM).

Length 9 mm, forewing 7 mm. Color similar to that described for holotype except as follows: extreme base of clypeus, supraclypeal area, interantennal lamella, flagellum beneath, and tegula, black, and mid trochanter yellow.

Characters peculiar to the male: clypeus in profile moderately convex, the apical margin of median lobe very weakly tridentate, the lateral teeth stronger than median, clypeal margin without lateral fimbria; inner eye margins not converging above or below; anterior carina on lateral surface of pronotum extending upward to dorsal surface; 1st tergum very slender, twice as long as wide; pygidium with moderately scattered punctures; 5th and 6th sterna with transverse subbasal fimbriae; hypopygium at apex shallowly emarginate, the lateral teeth acute.

PARATYPES.—5 ♀, 4 ♂, same data as holotype but taken on 8, 10, 11, 13, 14, and 16 June 1956, (BPBM). 1 ♂, Boku, southern Bougainville, 50 m, 5 June 1956, E. J. Ford, Jr. (BPBM). 1 ♂, Buka Agricultural Station, 6–10 December 1959, T. C. Maa (BPBM). Paratypes are in the United States National Museum, British Museum (Natural History), and B. P. Bishop Museum.

Female paratypes are 10–11 mm long. Two specimens have a tiny posterolateral yellow spot on fifth tergum, and three specimens lack the yellow posterolateral spot on the third sternum. The male paratypes are 8.5–9.5 mm long, and are very similar to the allotype except that the yellow markings on the second tergum are reduced, that on the anterior portion being represented by small paired spots.

15d. *Cerceris vellensis segiensis*, new subspecies

This subspecies is readily distinguished from typical *vellensis* by having very much reduced ivory maculations and by lacking red integument. It is superficially similar in appearance to *bougainvillensis novogeorgica*, but may be separated easily by its more slender build, and by the conformation of the clypeal process of the female.

HOLOTYPE.— ♀, Segi, New Georgia, Solomon Islands, 7 May 1934, H. T. Pagden, in new clearing (BMNH).

Length 9.5 mm, forewing 8 mm. Black; the following ivory—mandible on basal half, clypeus except base of median lobe, apex of process and apical margin, subrectangular mark along inner eye margin extending not quite to level of antennal insertions, and fore tibia and tarsus above; the following reddish—flagellum beneath, and mid tibia and tarsus beneath; legs elsewhere brownish to black.

Punctation and body proportions as in typical *vellensis;* comb of fore basitarsus with 7 spines, hind tibia with 6 serrations on one side, 7 on the other.

MALE.—Unknown.

16. *Cerceris bougainvillensis* Tsuneki

This polytypic species of the Solomons and Bismarck Archipelago is distinguished in the female by the relatively broad pygidium (Figure 23) and dentition of the apical margin of the clypeus (Figures 17–19), and in the male by the more strongly convex clypeus with a nondentate apical margin (Figure 21). I have seen specimens from only four islands or island groups: Guadalcanal and Santa Ysabel; New Georgia; Vella Lavella and Gizo; and Bougainville, Buka, and New Ireland. The population on each of these islands or island groups is subspecifically distinct. Adequate series are available from Guadalcanal, Santa Ysabel, New Georgia, Gizo, Bougainville, and Buka—these series indicate that there is very little variation in the basic color patterns of each of the subspecies.

16a. *Cerceris bougainvillensis solomonis*, new subspecies

FIGURES 2, 17, 23

This subspecies is more extensively maculated with yellow than any of the others and is also distinct in having the clypeal process of the female truncate at apex.

HOLOTYPE.— ♀, Haitete, Guadalcanal, Solomon Islands, 1000 m, in open grassy area, 27 October 1968, M. Maffi (USNM type 70435).

Length 15 mm, forewing 11 mm. Black, rather dull, the following yellow: base of mandible, clypeal process except base and apex, small lateral spot on clypeus, broad trapezoidal mark along inner eye margin extending upward to the level of the top of interantennal lamella, pronotal dorsum except narrowly in middle, small spot in middle of tegula, a pair of very small spots

on scutellum, band on postscutellum, a pair of small round spots on posterior surface of propodeum, transverse spot on basal third of 2nd tergum and a narrow apical band, 3rd tergum with an apical band which is narrow in middle and broadens laterally to cover most of sides, and narrow streaks on outer surface of fore and mid tibiae. The following are ferruginous: middle of mandible, scape, flagellum beneath, most of tegula, legs except coxae and the brownish hind tarsi. Vestiture sparse, short, and brownish. Wings moderately infumated with brownish, the marginal cell and apex anteriorly of forewing more strongly so, stigma and veins brownish.

Head (Figure 17) rounded in frontal aspect, the width 1.3 times the height (apex of clypeus to posterior ocelli); inner eye margins converging above, the interocular distance across posterior ocelli 0.85 times that at intersection of epistomal suture and inner eye margin; inner margin of mandible with a strong obtuse tooth at basal third; apical margin of clypeus deeply emarginate in middle, the angles rounded, and with a small acute tooth at edge of median lobe; clypeus densely micropunctate and with a few, scattered larger punctures, the process large and erect, tapering somewhat toward apex, as long as broad and with a truncate apical margin; supraclypeal area convex; face densely micropunctate, and with large contiguous punctures and some tendency to rugosity below ocelli; vertex and temples with punctures a little more separated than on front; 1st flagellar segment slightly longer than 2nd.

Pronotal dorsum with large contiguous punctures, the scutum and scutellum similarly but a little more sparsely punctate; postscutellum densely micropunctate and with a few scattered small punctures; anterior carina on lateral surface of pronotum not lamellate, not extending onto dorsum; mesopleuron coarsely and obliquely rugosoreticulate, not dentate or tuberculate; metapleuron with close oblique rugae; propodeal enclosure with the grooves crenulate, the median one more coarsely so than the lateral, the extreme base with a few oblique rugae, the rest of surface densely micropunctate except for a few large punctures along lateral margins; remainder of propodeum with large, mostly contiguous punctures except concave area above abdominal attachment which has a pair of parallel carinae in middle.

Comb of fore basitarsus with 8 spines; hind tibia with 7 serrations.

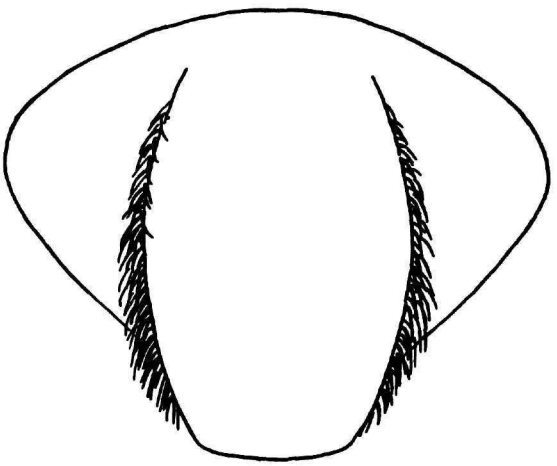


FIGURE 23.—Female pygidium, *C. bougainvillensis solomonis*, new subspecies; paratype, Tenaru River, Guadalcanal.

First tergum subquadrate, the length slightly greater than greatest width, the sides subparallel almost to apex where they converge slightly, the surface with large, close punctures; 2nd to 4th terga with large subcontiguous punctures, the 5th a bit more sparsely punctate; pygidium (Figure 23) broad, its length 1.4 times its greatest width, sides rounded, surface coarsely and irregularly wrinkled and with a few, suberect short setae on basal third; 1st sternum with a low rounded keel on basal third; 2nd sternum flat at base; 5th sternum not swollen laterally; hypopygium (Figure 2) with apical teeth separated by a U-shaped emargination, the lateral margin with a large acute tooth adjacent to apical tooth.

ALLOTYPE.— ♂, same data as holotype (USNM).

Length 12 mm, forewing 9 mm. Color similar to that described for holotype except as follows: clypeus all yellow except narrow apical margin, scape yellow beneath, scutellum with a yellow band, mid and hind trochanters yellow beneath, and fore and mid femora with a yellow blotch beneath at apex. Vestiture, wing color, and punctation as described for female.

Characters peculiar to the male: clypeus in profile strongly convex, the apical margin of median lobe broadly rounded and not dentate laterally, without a fimbria; inner eye margins not converging above or below; anterior carina on lateral surface of pronotum extending upward to dorsal surface; 1st tergum slender, the length 1.3 times the greatest width; pygidium subcontiguously punctate, the width two-thirds the length; 5th and 6th sterna with transverse subbasal fimbriae;

hypopygium at apex shallowly emarginate, the lateral teeth short and acute.

PARATYPES.—3 ♀, 1 ♂, Betikama River, Guadalcanal, August-September 1960, W. W. Brandt (BP BM). 1 ♀, Tenaru River, Guadalcanal, January 1945, G. E. Bohart (CAS). 1 ♀, Lunga River bridge, Guadalcanal, 20 July 1960, C. W. O'Brien (BPBM). 1 ♂, Guadalcanal, 1944, D. E. Beck (USNM). 1 ♂, Suta-(Suta-Gold Ridge) Jonapau Mountain, 1000 m, 29 June 1956, J. L. Gressitt (BPBM). 5 ♂, Molao, Santa Ysabel, 30 June 1960, C. W. O'Brien (BPBM). 1 ♂, Kolotuve, Santa Ysabel, 21 June 1960, C. W. O'Brien (BPBM). Females are 11.5–16 mm long, and are very similar to the holotype in coloration. Males are 9–13 mm long. The Guadalcanal males and one of the Santa Ysabel males are colored as in the allotype, but the other males from Santa Ysabel have the band at the apex of the second tergum divided into a median and pair of lateral spots or the median spot may be lacking. Paratypes have been placed in the United States National Museum, the British Museum (Natural History), and one female in the University of Minnesota.

16b. *Cerceris bougainvillensis lavellensis*, new subspecies

This subspecies is distinct in having a great deal of red on the basal abdominal segments. The shape of the clypeal process of female is identical to that of *b. novogeorgica*, a development which is intermediate between that of *b. solomonis* and typical *bougainvillensis*.

HOLOTYPE.—♀, Vella Lavella, Solomon Islands, 12–20 October 1943, P. D. Hurd (USNM type 70126).

Length 15 mm, forewing 12 mm. Black, rather dull, the following yellow: broad trapezoidal mark along inner eye margin extending upward to the level of top of interantennal prominence, pronotal dorsum except narrowly in middle, spot on each side of scutellum, band on postscutellum, and a pair of small spots on posterior surface of propodeum. The following are ferruginous: mandible except apex, clypeus except apical margin narrowly and base and apex narrowly of process, scape, flagellum beneath, broad stripe on temple posteriorly, tegula, median spot on scutellum, narrow band adjacent to propodeal enclosure, 1st tergum, 2nd tergum except a narrow median streak on basal two-thirds, 3rd tergum except a semicircular spot at base in middle, 1st sternum except basal third, broad transverse apical bands on 4th and 5th sterna, and all legs. Vestiture, wing color and punctation as in *b. solomonis*. The few structural characters in which it differs from *b. solomonis* are: apex of clypeal process shallowly emarginate, the propodeal enclosure weakly, transversely rugulose, comb of fore basitarsus with 7 spines, hind tibia with 7 or 8 serrations, and pygidium a bit broader, 1.2 times as long as greatest width.

ALLOTYPE.—♂, Vella Lavella, Solomon Islands, 12–20 October 1943, P. D. Hurd (USNM).

Length 10 mm, forewing 8.5 mm. Similar in coloration to female except as follows: clypeus red except apex of median lobe, temple black, scutellum with an entire yellow band and no red median spot, 1st tergum with a tiny yellow spot at apex, 3rd tergum with a narrow, apical yellow band, succeeding terga almost or entirely reddish as are all sterna and all legs. Vestiture, wing color, and punctation also similar to those detailed for female. In the characters peculiar to the male alone, it is identical with *b. solomonis*.

PARATYPES.—6 ♀, 3 ♂, Gizo Island, New Georgia group, Solomon Islands, 50–120 m, 27 June and 15, 17, 18, and 20 July 1964, J. and M. Sedlacek, 4 ♀, 1 ♂ in Malaise trap (BPBM). Females are 14–15 mm long and males 10–12 mm. The coloration is similar to that described above, except that the females have a narrow yellow line at the apical margin of the third tergum. Paratypes have been placed in the United States National Museum and the British Museum (Natural History).

16c. *Cerceris bougainvillensis novogeorgica*, new subspecies

FIGURES 18, 21

This subspecies is most like *b. lavellensis* in shape of the clypeal process of the female. It is distinguished from that subspecies, and from all others also, by the almost totally black integument with very few creamy rather than yellow markings.

The splendid type series of 22 individuals was taken by J. G. Franclemont in dense jungle nesting in a vertical clay bank along a recently cut road.

HOLOTYPE.—♀, Munda Point area, New Georgia, Solomon Islands, 7 April 1944, J. G. Franclemont (USNM type 70127).

Length 15 mm, forewing 12 mm. Black, with black pubescence, the following creamy: narrow stripe along

inner eye margin extending upward to level of top of antennal fossae, tiny posterolateral streak on pronotal dorsum, band on postscutellum interrupted in middle, and short streak on outer surface of fore tibia at base. Punctation and sculpture almost identical with those of *b. lavellensis,* except that propodeal enclosure is as in *b. solomonis;* head (Figure 18); comb of fore basitarsus with 9 spines; hind tibia with 7 serrations.

Female paratypes vary in length from 12.5 to 15 mm, and have a forewing length of 10 to 12 mm. They are similar to the type except in a few details of the pale maculations as follows: pale markings are occasionally reduced, in one specimen entirely lacking, and another specimen has a pale spot on tegula.

ALLOTYPE.—♂, same data as type (USNM).

Length 12 mm, forewing 9.5 mm. Similar to the female in vestiture, wing color, punctation, the creamy maculations also the same except that middle of clypeus is also marked. The characters peculiar to the male are as listed for *b. solomonis.*

Male paratypes vary in length from 10.5 to 13 mm, and have a forewing length of 8.5 to 10.5 mm. They are quite similar in all details to the allotype, and show the following color differences: clypeus black in two specimens, one specimen is entirely black, one has a pale mark on mid tibia also, and about half of them have the thoracic markings somewhat reduced.

PARATYPES.—10 ♀, 10 ♂, Munda Point area, New Georgia, 7 April (9 ♀, 9 ♂) and 3 July (♀, ♂), 1944, J. G. Franclemont (KVK). Paratypes have been placed in the United States National Museum, the British Museum (Natural History), and one pair in the University of Minnesota.

16d. *Cerceris bougainvillensis bougainvillensis* Tsuneki, new status

FIGURE 19

Cerceris bougainvillensis Tsuneki, 1968a, p. 8.

Tsuneki described this as a species, not having material of any of the other subspecies. I have not seen any of Tsuneki's type series, which is in the American Museum of Natural History, but I have specimens from the same collection bearing identical label data.

The larger females are distinct in having a larger clypeal process with parallel sides. The smaller specimens, however, have the clypeal process shaped more as in *b. novogeorgica* and *b. lavellensis.*

FEMALE.—Length 11–19 mm, forewing 10–15 mm. Black, rather dull, the following yellow: base of mandible, band across middle of clypeal process, streak beneath clypeal process, spot laterally on clypeus, broad trapezoidal mark along inner eye margin extending upward to the level of top of interantennal prominence, pair of large lateral spots on pronotal dorsum, band on postscutellum, pair of round spots on posterior surface of propodeum, tiny spot on each side posteriorly of 1st tergum, transverse band on basal third of 2nd and a small spot on each side posteriorly, apical band on 3rd tergum, narrow in middle, broadening to half the width laterally, small spots on fore and mid trochanters, and outer surface of fore and mid tibiae. The following are reddish: flagellum beneath, tegula, fore and mid tibiae beneath, and fore and mid tarsi entirely. Vestiture dark brown. Wings comparatively more strongly infumated than in *b. solomonis.* Punctation and sculpture as in *b. solomonis* except as follows: clypeal process in larger specimens disproportionately larger with parallel sides and an emarginate apex (Figure 19), in smaller specimens with the sides converging toward apex and the whole process smaller; comb of fore bastiarsus with 8 or 9 spines; hind tibia with 8 or 9 serrations; and pygidium a bit broader, about 1.2 times as long as broad.

MALE.—Length 10–14 mm, forewing 9–12 mm. Similar to female in coloration except as follows: clypeus and all trochanters entirely yellow, fore and mid femora yellow beneath at apex; vestiture grayish.

Solomon Islands: 3♀, Bougainville, 2 and 5 May 1928 (AMNH). 1♀, Bougainville, Rev. A. H. Voyce (SAM). 1♀, Sovele Mission, southern Bougainville, 250 m, 6 June 1956, J. L. Gressitt (BPBM). 3♂, Kokure, southern Bougainville, 690 meters, 10, 16, and 17 June 1956, E. J. Ford, Jr. (BPBM). 6♂, Buka Agricultural Station, 6–10 December 1959, T. C. Maa (BPBM).

Bismarck Archipelago: 1♂, Lelet Plateau, Schleinitz Mountains, New Ireland, October 1959, W. W. Brandt (BPBM).

Literature Cited

Brèthes, J.

1920. Appendice: Description d'un *Cerceris* nouveau de Nouvelle-Guinée *in* Vespides, Euménides et Sphégides Sudamericains de la collection Jules de Gaulle. *Annales de la Société Entomologique de France,* 88: 391–411.

Cameron, P.
1906. Résultats de l'expédition scientifique néerlandaise à La Nouvelle-Guinée. Hymenoptera I [all families, except Apidae and Formicidae]. *Nova Guinea,* 5:41–65.

Dalla Torre, K. W. von
1897. *Catalogus Hymenopterorum, Fossores (Sphegidae),* 8:1–749.

Iwata, K.
1939. Habits of Some Solitary Wasps in Formosa (IV). *Transactions of the Natural History Society of Formosa,* 29:161–178. [In Japanese.]

Smith, F.
1864. Catalogue of Hymenopterous Insects Collected by Mr. A. R. Wallace in the Islands of Mysol, Ceram, Waigiou, Bouru and Timor. *Journal of Proceedings of the Linnean Society of London,* Zoology, 7:6–48.
1873. Descriptions of New Species of Fossorial Hymenoptera in the Collection of the British Museum, and of a Species of the Rare Genus *Iswara* Belonging to the Family Dorylidae. *Annals and Magazine of Natural History,* series 4, 12:251–260, 291–300, 402–415.

Strand, E.
1911. Ergebnisse einer Zoologischen Forschungsreise in den südöstlichen Molukken (Aru- und Kei-Inseln) im Auftrag der Senckenbergischen Naturforschenden Gesellschaft ausgeführt von Dr. Hugo Merton. Crabronidae und Pompilidae. *Abhandlungen Senckenbergische Naturforschende Gesellschaft,* 34 (2):231–233.

Tsuneki, K.
1968a. On some *Cerceris* from Australia, with a Tentative Key to the Australian Species (Hymenoptera, Sphecidae). *Etizenia,* 28:1–32.
1968b. *Cerceris* from the Western Pacific Areas (Hymenoptera, Sphecidae). *Etizenia,* 29:1–36.

Turner, R. E.
1912. A Revision of the Australian Species of the Genus *Cerceris* (Hymenoptera). *Proceedings of the Linnean Society of New South Wales,* 36:664–678.

Vecht, J. van der
1964. The *Cerceris* Species of Java (Hymenoptera Sphecoidea). *Zoologische Mededelingen,* 39:348–368.

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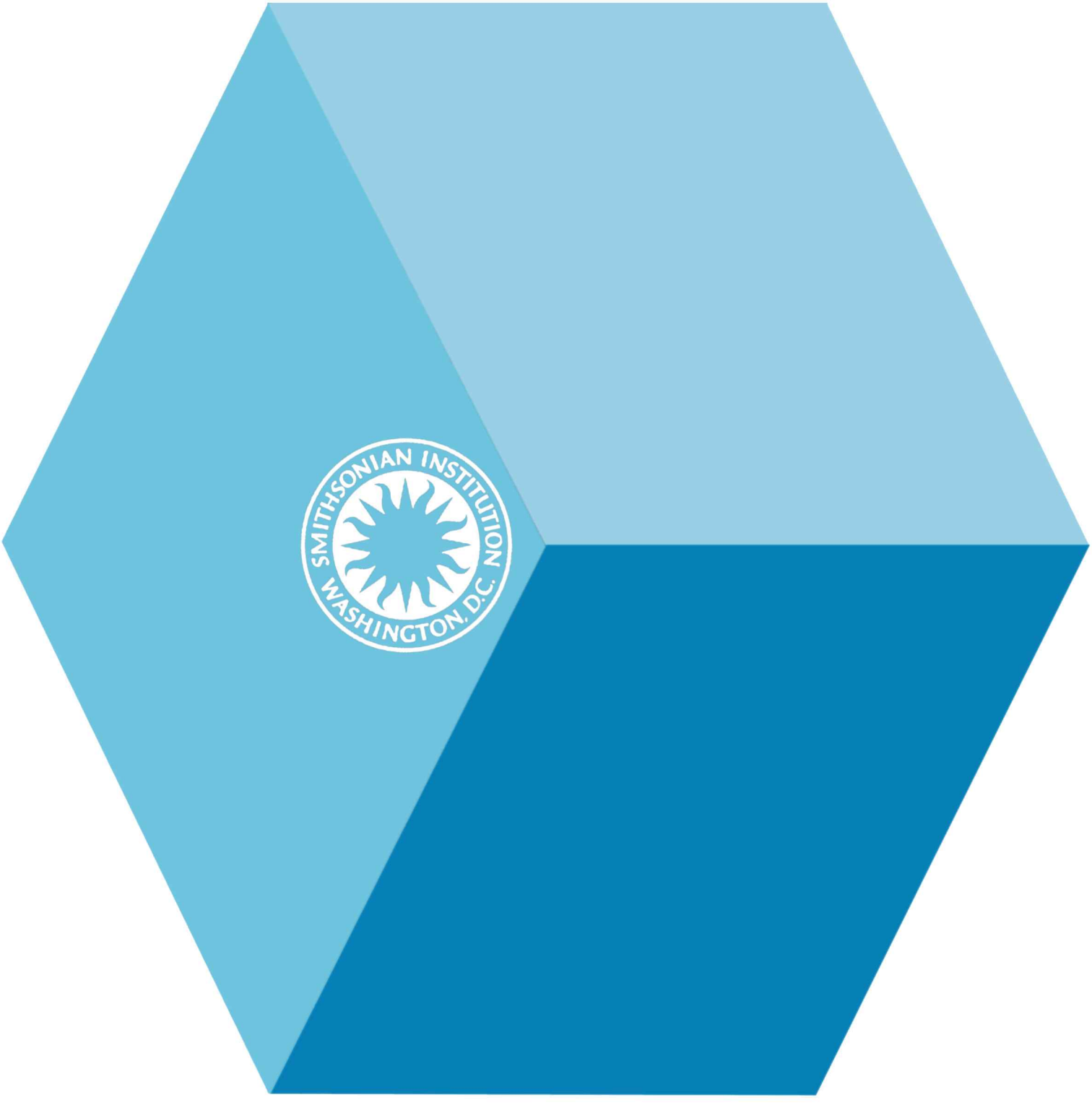
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