

Biosystematic Studies
of Ceylonese Wasps, VIII:
A Monograph of the Philanthidae
(Hymenoptera: Sphecoidea)

KARL V. KROMBEIN

SMITHSONIAN CONTRIBUTIONS TO ZOOLOGY • NUMBER 343

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SMITHSONIAN INSTITUTION PRESS

City of Washington

1981

ABSTRACT

Krombein Karl V. Biosystematic Studies of Ceylonese Wasps, VIII: A Monograph of the Philanthidae (Hymenoptera: Sphecoidea). *Smithsonian Contributions to Zoology*, number 343, 75 pages, 89 figures, 1981.—Seventeen species-level taxa are recorded from Sri Lanka, one belonging to *Philanthus* Fabricius (Philanthinae) and 16 to *Cerceris* Latreille (Cercerinae). Three taxa are known only from Sri Lanka, 12 occur also in India, and two are more widely distributed in the Oriental region. Four new species are described, *C. intrusa*, *C. eumolpicida*, *C. conifera*, and *C. curculioncida*; the first two occur also in India, and the latter two are endemic. Fourteen species are assigned to species groups already established for Palaearctic species, the *triangulum* group of *Philanthus* and the *rybyensis*, *bupresticida*, *rubida*, *alboatra*, and *albofasciata* groups of *Cerceris*. Three species are assigned to three new monotypic groups of *Cerceris*, *conifera*, *curculioncida*, and *interstincta*.

Nine taxa occur in both the Dry Zone and the Wet Zone, five occur predominantly in the Dry Zone and sparingly in the Wet Zone, and three are restricted to the Wet Zone. Seven taxa are found only at low altitudes, sea level to several hundred feet, seven occur from sea level to 2200 ft, two are restricted to intermediate altitudes, 500–2100 ft, and one is found only in higher Wet Zone altitudes, 2100–6500 ft.

Accounts of nesting behavior, descriptions of nests, and/or prey records are detailed for 11 taxa. The development of a buprestid clamp to assist in transporting prey is postulated for members of the *bupresticida* group of *Cerceris*.

OFFICIAL PUBLICATION DATE is handstamped in a limited number of initial copies and is recorded in the Institution's annual report, *Smithsonian Year*. SERIES COVER DESIGN: The coral *Montastrea cavernosa* (Linnaeus).

Library of Congress Cataloging in Publication Data

Krombein, Karl V.

Biosystematic studies of Ceylonese wasps, VIII.

(Smithsonian contributions to zoology ; no. 343)

Bibliography: p.

1. Philanthidae—Classification. 2. Insects—Classification. 3. Insects—Sri Lanka—Classification. I. Title. II. Series.

QL1.S54 no. 343 [QL568.P5] 591s [595.79'8] 81-607805 AACR2

Contents

	<i>Page</i>
Introduction	1
Systematics	2
Species Group Assignments	2
Distribution and Ecology	5
Treatment of Individual Taxa	6
Acknowledgments	7
Biology	8
<i>Philanthus basalis basalis</i> Smith	9
<i>Cerceris pictiventris novarae</i> Saussure	10
<i>Cerceris bidentula spiniventris</i> Tsuneki	10
<i>Cerceris dissecta</i> (Fabricius)	12
<i>Cerceris vischnu vischnu</i> Cameron	13
<i>Cerceris eumolpicida</i> , new species	13
<i>Cerceris bifasciata</i> Guérin	13
<i>Cerceris specifica</i> Turner	13
<i>Cerceris conifera</i> , new species	14
<i>Cerceris curculionida</i> , new species	15
<i>Cerceris tetradonta</i> Cameron	15
Key to Ceylonese Philanthidae	16
Subfamily PHILANTHINAE	22
1. <i>Philanthus basalis basalis</i> Smith	22
Subfamily CERCERINAE	23
2. <i>Cerceris protea</i> Turner	23
3. <i>Cerceris intrusa</i> , new species	25
4. <i>Cerceris pictiventris novarae</i> Saussure	26
5. <i>Cerceris wickwari</i> Turner	28
6. <i>Cerceris bidentula spiniventris</i> Tsuneki, new status	30
7. <i>Cerceris mastogaster</i> Smith	32
8. <i>Cerceris dissecta</i> (Fabricius)	34
9. <i>Cerceris vischnu vischnu</i> Cameron, new status	36
10. <i>Cerceris eumolpicida</i> , new species	38
11. <i>Cerceris bifasciata</i> Guérin	39
12. <i>Cerceris pulchra pulchra</i> Cameron, new status	42
13. <i>Cerceris specifica</i> Turner	44
14. <i>Cerceris conifera</i> , new species	47
15. <i>Cerceris curculionida</i> , new species	49
16. <i>Cerceris tetradonta</i> Cameron	50
17. <i>Cerceris interstincta interstincta</i> (Fabricius)	51
Literature Cited	54
Figures	56

Biosystematic Studies of Ceylonese Wasps, VIII: A Monograph of the Philanthidae (Hymenoptera: Sphecoidea)

Karl V. Krombein

Introduction

The solitary flower-loving wasps of the family Philanthidae constitute one of the more attractive major groups of the wasp fauna of Sri Lanka. The black or red ground color is handsomely embellished with pale markings of variable extent, ranging from white to ivory to pale or lemon yellow according to each species.

Many of the specimens of *Cerceris* bear pollen grains on the body, showing that they frequented flowers for nectar. We collected specimens on small flowers having easily accessible nectaries. Hence, the common name "flower-loving" is not inappropriate. A number of specimens of several species was collected at Hunuwilagama visiting the flowers of a creeper, vempadam (*Ventilago maderaspatana* Gaert, Rhamnaceae).

The nesting and predatory behavior enhance the fascination that attracts one to these wasps. Many species, if not all, nest in the ground in small aggregations, which apparently persist from year to year at the same site. The prey is diverse, and the female of each species stores adults of a particular group of insects as food for the larva.

One species is a bee wolf, preying upon the domesticated honeybee, another preys upon solitary bees, and a third preys on small chalcidoid flies that parasitize ants. Still others store beetles as larval food, some preying upon weevils, others on leaf beetles of several kinds, and one on several species of metallic wood-boring beetles. Each species constructs several cells per nest and stores a number of prey per cell. Females of three Ceylonese species may share a common burrow entrance. It is not known whether each female has her own cells off the burrow axis or whether they share a division of labor. None of the other species observed has this intriguing trait.

The earliest record of a philanthid from Sri Lanka was in 1856, when Smith described *Philanthus basalis* from a female labeled just "Ceylon." It may be presumed that the specimen came from Kandy, the locality where the species is now most abundant. If so, the unique type was undoubtedly collected between 1815, when the last native kingdom, the Kandyan, capitulated to the British, and the late 1840's or early 1850's. Saussure (1867) described *Cerceris novarae*, *C. humbertiana*, and *C. emortualis* from Ceylon, the latter two being recognized later as synonymous. In his monograph of the Indian *Cerceris*, Turner (1912) described two species from Ceylon, *C. wickwari* and

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C. specifica, and recorded five others that had been described from India. In the material available to me I found three additional species known previously only from India, and I am describing four new taxa, two peculiar to Sri Lanka and two that occur also in South India. Summing up, three of the Ceylonese philanthids are known only from Sri Lanka, and 14 occur also in South India or are more widely distributed in the Indian subcontinent. It seems probable that thorough collecting in South India may eventually reduce the number of Ceylonese endemics.

The preceding number in my series "Biosystematic Studies of Ceylonese Wasps" is "VII: A Preliminary Analysis of Affinities and Derivation of the Wasp Fauna of Sri Lanka (Hymenoptera: Aculeata)," *Entomologia Generalis*, 1981, 7(4): [in press].

SYSTEMATICS.—The Ceylonese philanthids are quite readily distinguished from the other families of Sphecoidea occurring in that country. The family is represented by only two subfamilies (four others occur elsewhere), the Philanthinae with the single genus *Philanthus* Fabricius, and the Cercerinae with the single genus *Cerceris* Latreille.

The Philanthinae and Trypoxyloninae of the Larridae are the only Ceylonese sphecoids in which the inner margin of the eye is deeply emarginate so that in frontal view the eye is reniform in outline. The single philanthine species is a large, heavy-bodied wasp with yellow markings on the head, thorax, and abdomen. The Trypoxyloninae are either slender and elongate or short, small broad forms, but in no species are there yellow markings.

The Cercerinae are unique among Ceylonese sphecoids in having the apex of the hind femur broadened in both sexes, truncate, and with a reniform outline. Other groups of sphecoids also have this character, but none occur in Sri Lanka.

SPECIES GROUP ASSIGNMENTS.—J. de Beaumont proposed a number of species groups for western Palearctic *Philanthus* (1949, 1960) and *Cerceris* (1951, 1952 [1950]). Most of the Ceylonese philanthids can be assigned to some of the groups, but study of these Oriental taxa discloses that de

Beaumont's characterizations of the various groups require expansion and some redefinition. I am grateful to W. J. Pulawski, Wroclaw, Poland, who has made many helpful suggestions relative to interpretation and redefinition of groups and comments as to assignment of the Ceylonese taxa.

The *triangulum* Group: *Philanthus basalis* Smith and the Palearctic and Ethiopian *P. triangulum* Fabricius are the only species referable to this group. Both species have the mesopleuron and propodeal enclosure closely and entirely punctate and the first abdominal segment broadened apically. The diagnosis (de Beaumont, 1949:180) should be modified to indicate that the apical lobe of female clypeus may have one or two strong teeth in the middle and a weak tooth on each side, that the male clypeal brushes may meet on the midline or be separated by about the width of a brush, that the apical margin of median lobe of male clypeus is tridentate, that the lateral margin of the seventh sternum of male lacks a median tooth, and that longer setae on the male eighth sternum are confined to the narrowed apical third.

So far as known, species of the *triangulum* group prey primarily upon worker honeybees, but *P. triangulum* upon rare occasions mixes in a few halictid or andrenid bees.

Philanthus basalis Smith is the only Ceylonese species belonging to this group.

The *rybyensis* Group: This group (de Beaumont, 1951:310, 311), as well as the *alboatra*, *bupresticida*, *rubida*, and *conifera* groups, differs from other *Cerceris* in lacking a median subapical fossa on any of the abdominal terga and in having an irregular color pattern on the abdominal terga, i.e., the first or second through fifth not uniformly fasciate apically except in the *curculionocida* group; the pattern is not visible in some desert species in which the abdomen is completely yellow. Other distinctive features are: horizontal part of metasternum truncate at apex, the posterior declivity undivided and with a median carina; jugal lobe of hind wing not exceeding half the length of submedian cell, usually much shorter; hind coxa

carinate on inner central margin (attaining acetabulum of hind trochanter), but carina weak in *C. cheops* Beaumont and *C. pruinosa* Morawitz (*rybyensis* group), weak or absent in *C. abacta* Shestakov, *C. alboatra* Walker, and *C. specifica* Turner (*alboatra* group), and absent in *C. pallidula* Morawitz and *C. priesneri* Mochi (*rybyensis* group) and *C. palmetorum* Beaumont (*bupresticida* group); last segment of male antenna simple; and apical margin of male clypeal lobe truncate or weakly projecting, without median tooth.

There is no single character that separates the *rybyensis* group from other groups. As in the *bupresticida* group the female sixth abdominal sternum ends in a pair of median projections and lacks a lateral tooth but lacks the modified fifth sternum. The female clypeus lacks a discal process, unlike the *alboatra* and *rubida* groups. Unlike the *alboatra*, *bicincta*, and *bupresticida* groups, the apical margin of the female clypeal lobe is simple or has only a single obtuse median tooth (*C. meditata* Shestakov, *C. spectabilis* Radoszkowski, and *C. spinifera* Kazenas), and is not angulate laterally except in *C. edolata* Shestakov. Most species have a well-defined basal platform on second abdominal sternum, but it is poorly developed in *C. albicincta* Klug and *C. histrionica* Klug; this platform is absent in most other *Cerceris*, or poorly developed as in some members of the *alboatra*, *bupresticida*, and *rubida* groups, or well defined as in *C. pulchra* Cameron of the *rubida* group and *C. conifera*, new species, of the *conifera* group. The female clypeus is concave medially on the lower half except in *C. pallidula* Morawitz and *C. priesneri* Mochi; the clypeus is not concave in other *Cerceris*.

Insofar as is known, members of the *rybyensis* group prey upon solitary bees.

The Ceylonese taxa assigned to this group are *C. protea* Turner, *C. intrusa*, new species, *C. pictiventris novaruae* Saussure, and *C. wickwari* Turner.

The *bupresticida* Group: Females of this group are readily recognized by the presence of a buprestid clamp (Figure 89) on the fifth abdominal sternum consisting of a shallow median concavity near apex margined posteriorly by an erect lamella in most species; however, in *C. mastogaster*

this clamp consists of erect lateral processes on the third to fifth sternum, and the fifth sternum has a broad, shallowly concave median area margined posteriorly in middle by an erect angulate process. The fifth sternum in *C. wickwari* Turner (*rybyensis* group) is somewhat similar, but the concavity is subbasal, attaining the basisternum, and it is margined posteriorly by small tubercles across middle of sternum. Males have an acute posterolateral tooth on sixth abdominal sternum, which is evanescent or absent in some species; such a tooth occurs also in *C. fischeri* Spinola (*rybyensis* group). Otherwise the *bupresticida* group is similar in many details to the *rybyensis* group, q.v. Unlike the *rybyensis* group the female clypeal lobe has dentate lateral angles, and there are two teeth between the angles, and in many species a pair of close tubercles just above the apical margin.

So far as is known, members of this group prey upon buprestid beetles.

The Ceylonese representatives of the group are *C. bidentula spiniventris* Tsuneki and *C. mastogaster* Smith.

The *rubida* Group: Members of this group share many characters of the *rybyensis* group, q.v., but females have a discal process on the clypeus. The basal platform on second sternum is absent or evanescent but well developed in *C. pulchra* Cameron. The sixth abdominal sternum of the female ends in a pair of median projections, and there is a lateral tooth.

The prey recorded for species of this group are beetles belonging to the Bruchidae, Chrysomelidae, Curculionidae, Nitidulidae, and Phalacridae. The Ceylonese species prey chiefly on chrysomelid beetles, but weevils may be mixed occasionally with the chrysomelids.

The Ceylonese taxa assigned here are *C. dissecta* (Fabricius), *C. vischmu vischmu* Cameron, *C. eumolpicida*, new species, *C. bifasciata* Guérin, and *C. pulchra pulchra* Cameron.

The *alboatra* Group: This group is similar in many characters to the *rybyensis*, q.v., *bupresticida*, *rubida*, and *conifera* groups but is distinctive in having noncarinate hind coxae, although *C. pal-*

lidula Morawitz and *C. priesneri* Beaumont (*rybyensis* group) and *C. palmetorum* Beaumont (*bupresticida* group) also have noncarinate hind coxae. As in those species, females of the *alboatra* group have the sixth abdominal sternum ending in two projections, but they also have a tooth on lateral margin not present in the others. Most females have a discal lamella on the clypeus (only two tubercles in *C. abacta* Shestakov). Some species, e.g., *C. abacta*, *C. alboatra* Walker, *C. angustata* Morawitz, and *C. specifica* Turner, have a slender first abdominal segment and base of the second strongly narrowed, but this occurs also in males of *C. tricolorata* Spinola of the *bupresticida* group. The basal platform of second sternum is lacking except in *C. nipponensis* Tsuneki. The *rubida* group is most similar, but it has carinate hind coxae.

Cerceris carinalis Pérez and *C. nipponensis* prey upon Curculionidae and Chrysomelidae.

Cerceris specifica Turner is the only Ceylonese representative of the group. It preys upon flea beetles only (Chrysomelidae).

The *conifera* Group: This newly recognized, monotypic group is basically similar to the *rybyensis* group and relatives, q.v. It is distinguished by the peculiar female clypeus, which has a subbasal conical median prominence. It shares some characters with the *bicincta* group, which does not occur on the Indian subcontinent, except that the second abdominal sternum has a well-developed basal platform. The median lobe of the female clypeus is truncate with blunt lateral angles. The last abdominal sternum ends in two projections, and there is a tiny tooth on lateral margin. The fourth through sixth abdominal sternum of the male have dense micropunctures bearing short suberect hair.

The only member of the group is *C. conifera*, new species, which preys upon Eucharitidae (Chalcidoidea).

The *curculionicida* Group: This newly recognized group shares with the *arenaria* group the combination of a subapical median fovea on first abdominal tergum (rarely present on second) and a very short jugal lobe of the hind wing, which is only one-fourth as long as submedian cell. Mem-

bers of the *doederleini* group and *C. abdominalis* (Fabricius) and *C. vittata* Lepelletier (*abdominalis* group) are similar, but abdominal terga two through five each have a subapical median fovea. The horizontal surface of metasternum ends in a short median point as in the *abdominalis* group, but the declivity has a median carina. The latter group differs also in having a subapical fovea on abdominal terga one through five (female) or six (male). The second abdominal sternum lacks a raised basal platform, and the hind coxa lacks an inner ventral carina. The female clypeus has a well-developed process with a thickened apex and the apical margin of lobe with a median projection flanked on each side by a large tooth. The sixth abdominal sternum of the female ends in two stout projections, and the lateral margin is not toothed. The male has basal half of median clypeal lobe strongly swollen and the apical margin feebly tridentate. The last flagellar segment of male is curved and truncate at apex. The apex of the male sixth sternum is slightly concave on median half and has a dense fringe of suberect setae laterally. This is the only known group in which a noncarinate hind coxa and apicomediale foveate first abdominal tergum are combined with an irregular pattern of pale abdominal maculations.

The sole included species, *C. curculionicida*, new species, preys upon weevils.

The *albofasciata* Group: This group shares with several other extralimital groups (*abdominalis*, *capito*, *cheskesiana*, *chlorotica*, *chromatica*, *doederleini*, *flavicornis*, *inara*, *specularis* and *tuberculata*) the following basic characters: at least the first abdominal tergum with a subapical median fovea; abdomen either unicolorous or the terga evenly fasciate apically; metasternal declivity divided into two triangles except in males of *C. specularis* Costa, which may be joined by their apices or broadly separated; jugal lobe of hind wing more than half as long as submedian cell; hind coxa without a carina on inner ventral margin or with only a very short one that does not extend to the acetabulum of hind trochanter; and second abdominal sternum without a basal platform. The

albofasciata group differs from these other groups in having the following combination of characters: inner eye margins not converging below, propodeal enclosure smooth or punctate, not rugulose; female sixth abdominal sternum ending in two projections, the lateral margin with a tooth; clypeal lobe of male with tridentate apical margin; and last antennal segment of male curved, truncate at apex. The *specularis* group is most similar, but unlike the *albofasciata* group, the hind coxa has the inner ventral margin carinate in some specimens, and the male metasternum is undivided.

The prey is known only for *C. albofasciata* (Rossi) and *C. tetradonta* Cameron and consists of adult tortoise beetles (Cassidinae, Chrysomelidae).

Cerceris tetradonta is the Ceylonese representative of the group.

The *interstincla* Group: *Cerceris interstincla* (Fabricius) cannot be placed in any of the previously recognized groups and is, therefore, assigned to a new monotypic group. It has most of the characters of the *albofasciata* group but differs in the female as follows: clypeal lobe with a large erect basal lamella, apical margin of pygidium concave instead of convex, and sixth abdominal sternum with a pair of very broad median projections, lateral margin with a blunt tooth. The male forecoxa is strongly produced anterolaterally, a feature more poorly developed in the *albofasciata* group.

DISTRIBUTION AND ECOLOGY.—The tabulation of species includes notes on distribution within Sri Lanka, the actual distribution for the wide-ranging species, and remarks on affinities and ecology.

1. *Philanthus basalis basalis* Smith: Occurs only at several localities in the hill country at altitudes of 1500-2100 ft and with moderate rainfall, and at one locality in the Dry Zone at 50 ft and about 40" of rainfall; it occurs also in southern and western India at similar altitudes. *Philanthus b. basalis* nests in horizontal burrows begun on nearly vertical soft sandstone banks. Several females may nest in a single burrow, each presum-

ably either storing her own cells with worker honeybees or exhibiting a division of labor.

2. *Cerceris protea* Turner: Occurs only in Dry Zone areas with very slight rainfall (25"-75") and at low altitudes; it is found also in southern and western India, presumably in similar areas.

3. *Cerceris intrusa*, new species: Occurs in both Dry Zone and Wet Zone in Sri Lanka, but only in areas of moderate to light rainfall and at relatively low altitudes; the species occurs also in South India at elevations of 1250-3400 ft.

4. *Cerceris pictiventris novarae* Saussure: A common and widely distributed taxon in Sri Lanka, occurring in both Dry Zone and Wet Zone with rainfall of 25" to over 200" and from sea level to 2200 ft altitude; it is found also in India, and other subspecies of *C. pictiventris* Dahlbom range through Southeast Asia eastward to New Guinea and the Solomon Islands and northward to China and Taiwan. This wasp nests in flat ground and preys upon solitary nomiine bees.

5. *Cerceris wickwari* Turner: A rather uncommon endemic taxon that has been taken in only a few localities in the Dry Zone and the Wet Zone in areas of light to moderate rainfall and at altitudes of 50 ft or less.

6. *Cerceris bidentula spiniventris* Tsuneki: A rather common taxon mostly in the Dry Zone, but occurring also in the Wet Zone in areas of heavy rainfall, and at altitudes from near sea level to 500 ft; it is found also in South India at altitudes ranging from 700 to 3100 ft and in Thailand; typical *C. bidentula* Maidl occurs in Malaya and Celebes. This wasp makes short vertical burrows in gravelly soil and preys upon slender buprestid beetles.

7. *Cerceris mastogaster* Smith: This rare taxon is known in Sri Lanka only from one female and four males from four localities in the Dry Zone and the Wet Zone, in areas of light to moderate rainfall and at altitudes from sea level to 50 ft; it occurs in India from Rajasthan to South India.

8. *Cerceris dissecta* (Fabricius): An abundant species restricted to elevations from sea level to 450 ft and mostly in the Dry Zone but occurring in the Wet Zone in areas with less than 150"

rainfall; occurs also in India, where Turner (1912: 811) noted that it was one of the commonest species. This species makes vertical burrows in a horizontal surface. It preys principally on flea beetles, but occasionally small weevils may be mixed in with the other prey.

9. *Cerceris vischnu vischnu* Cameron: This occurs in both the Dry Zone and the Wet Zone, in areas of low to heavy rainfall and at elevations from near sea level to 2100 ft; it is also widely distributed in India; the taxon is represented in Java by *C. v. roepkei* Maidl. This wasp nests in flat ground and preys upon chrysomelid beetles.

10. *Cerceris eumolpicida*, new species: This new species occurs mostly in the Dry Zone and at altitudes ranging from sea level to 1500 ft; it is also found in South India at altitudes of 700–3200 ft. One small aggregation nested in a sloping mud bank and preyed upon chrysomelid beetles.

11. *Cerceris bifasciata* Guérin: This abundant species occurs at a number of localities in the Dry Zone at altitudes of 100 ft or less and more sparingly in areas of moderate rainfall in the Wet Zone to an elevation of nearly 2300 ft; it is a variable, widely distributed species occurring throughout India, Southeast Asia to Java, and northward into China and Taiwan, but it apparently is not found in the Philippines. One female was captured with its weevil prey.

12. *Cerceris pulchra pulchra* Cameron: This taxon occurs in both the Dry Zone and the Wet Zone with rainfall ranging from less than 50" to over 200"; it occurs also in India; the subspecies *C. p. variaesimilis* Maidl occurs from Japan and China south to Malaya, Java, and the Philippines.

13. *Cerceris specifica* Turner: This is a relatively common species of the Wet Zone in areas of moderate to heavy rainfall and at altitudes of 2100–6500 ft; it occurs also in South India at altitudes of 2300–2500 ft and in Thailand. This wasp makes short vertical burrows in a gently sloping surface and preys upon flea beetles.

14. *Cerceris conifera*, new species: This endemic species is widely distributed in Sri Lanka, where it occurs in both the Dry Zone and the

Wet Zone in areas of less than 50" and more than 200" rainfall and at altitudes ranging from sea level to 2100 ft. This species makes vertical burrows in flat ground and preys upon eucharitid wasps.

15. *Cerceris curculioncida*, new species: This is an uncommon endemic species known from only one locality in the Wet Zone with rainfall of some 100" and at an altitude of 1650–2100 ft. *Cerceris curculioncida* begins its burrow in a nearly vertical bank of soft sandstone and preys upon weevils.

16. *Cerceris tetradonta* Cameron: This taxon occurs principally in the Dry Zone but also in the Wet Zone in areas of moderate rainfall, and at altitudes ranging from sea level to several hundred feet; it is found also in southern and western India and Pakistan. *Cerceris tetradonta* makes vertical burrows in flat, hard-packed soil and stores her cells with tortoise beetles.

17. *Cerceris interstincta interstincta* (Fabricius): This taxon has been collected from several localities in the Dry Zone with low rainfall and at altitudes ranging from sea level to 50 ft; it has been recorded from India also.

TREATMENT OF INDIVIDUAL TAXA.—In the section following the key are detailed treatments of each of the Ceylonese taxa. The references cited beneath each specific heading include the original description and those of any synonyms, notes on type fixation when appropriate, and all other references citing the taxon.

Several paragraphs of discussion follow on such subjects as distribution, synonymy, type fixation where required, and differentiating characters. Next are descriptions of the female and male, where both sexes are known. Finally there is a listing of the specimens examined arranged by province and district.

Label data are given in full for the type series of all new taxa. Label data for specimens of previously described taxa have been consolidated insofar as possible. For example, one consolidated record under *Cerceris pictiventris novarae* Saussure reads "5♀, 11♂, Colombo (includes Museum Garden), 15 and 28–31 Jan, 8–14 Feb, 28 Mar, Apr, 14, 16 and 28 Jun, Jul, Sep, Henry, Karunaratne,

Krombein et al., Nietner, Wijesinha (USNM, Colombo, Berlin).” Following the number of specimens and locality are specific dates of collection, except that the year is omitted. Dates are followed by the names of collectors, except that only the name of the first collector is cited from a label bearing the names of two or more collectors. Finally, the depositories in which the specimens are found are cited in parentheses; the only abbreviation used is USNM (former United States National Museum) for specimens in the National Museum of Natural History, Smithsonian Institution.

ACKNOWLEDGMENTS.—My field work in Sri Lanka was funded by Smithsonian Research Foundation grant SFG-0-6955, and travel was provided in part by grants from the Secretary’s Fluid Research Funds.

Within Sri Lanka I am indebted to Coprincipal Investigator W.T.T.P. Gunawardane, assistant in entomology, Department of National Museums, for arranging accommodations for our field parties. I am particularly grateful to P. B. Karunaratne, former curator of insects at the Museums, who assisted in making many of the biological observations reported herein as well as collecting a number of specimens. Theekshana Wijesinha served as the efficient chief technician, 1977–1981, and also drove the Project jeep very skillfully. The following Ceylonese technicians were dedicated and adept collectors at various times during my field work: D. W. Balasooriya, Ernest G. Dabrera, Jayalath Ferdinando, Prasanna Fernando, Thusita and Vajira Gunawardane, Mahinda Jayaweera, Lalith Jayawickrema, Sanjaya Karunaratne, Varuni Kulasekare, Prasanna Leanage, Gamini Ratnavira, Sunil Siriwardane, Lakshman Weeratunge, and N.V.T.A. Wera-goda.

W. J. Pulawski, Wroclaw University, Poland, made many helpful suggestions for redefinition of species groups in *Cerceris* and assignment thereto of the Ceylonese species.

Several specialists assisted in various ways with the types or type series of previously described species as follows: C. van Achterberg, Rijksmu-

seum van Natuurlijke Historie, Leiden, lent the types of *C. roepkei* Maidl and *C. variaesimilis* Maidl. M. C. Day and C. R. Vardy, British Museum (Natural History), London, lent the type series of *Cerceris abuensis* Turner, and the unique type of *C. mastogaster* Smith, and compared specimens with the type of *C. tetradonta* Cameron. M. Fischer, Naturhistorisches Museum, Wien, lent the types of *C. bidentula* Maidl, *C. emortualis* Saussure, *C. obtusedentata* Maidl, and *C. varia* Maidl. T. Naito, Kobe University, lent the type series of *C. fukaii basiferruginea* Tsuneki and the holotypes of *P. basalis clypeatus* Tsuneki, *C. maculiceps* Tsuneki, *C. nagamasa* Tsuneki, and *C. spiniventris* Tsuneki. C. O’Toole, University Museum, Oxford, lent the type series of *C. pulchra* Cameron and *C. tristis* Cameron. B. Petersen, Zoologisk Museum, Copenhagen, compared specimens with the type of *Philanthus dissectus* Fabricius.

The following have lent specimens that formed part of the series studied: P. H. Arnaud, California Academy of Sciences (San Francisco); P. Brinck, Lund University, Sweden (Lund); G. R. Ferguson, Oregon State University (Corvallis); W.T.T.P. Gunawardane and P. B. Karunaratne, National Museums of Sri Lanka (Colombo); E. Königsmann, Zoologisches Museum (Berlin); C. D. Michener, University of Kansas (Lawrence); B. Petersen, Zoologisk Museum (Copenhagen); J. van der Vecht, the loan of specimens in his custody from Naturhistorisches Museum (Basel).

I am grateful to the following specialists for identifications of the prey or parasites of the philanthid wasps: E. W. Baker, Systematic Entomology Laboratory (SEL), U.S. Department of Agriculture (USDA), Saproglyphidae; S. Bilý, Narodni Museum, Prague, Buprestidae; Z. Bouček, Commonwealth Institute of Entomology, London, Eucharitidae; Y. Hirashima, Kyushu University, Fukuoka, Halictidae; P. D. Hurd, Jr., Smithsonian Institution (SI), Apidae; S. L. Shute, British Museum (Natural History) (BMNH), Chrysomelidae; R. T. Thompson, BMNH, Curculionidae; R. E. White, SEL, USDA, Chrysomelidae.

Mary-Jacque Mann and Susann G. Braden,

Scanning Electron Microscope Laboratory (SI), took the photographs, and George L. Venable, Department of Entomology (SI), prepared the plates.

Sandra S. Shanks, Department of Entomology (SI), assisted by transcribing and assembling the label data on an extensive series of specimens.

I am most grateful to my wife Dorothy for offering perceptive editorial comments and for assisting with the tedious task of proofing galleys and page proof.

Biology

The Ceylonese philanthids are ground-nesting wasps, which tend to nest in small aggregations that persist year after year in the same location. It is possible that burrows may be used by subsequent generations as is certainly true in *Philanthus basalis basalis* Smith. Most species belonging to the genera *Philanthus* and *Cerceris* nest on a flat to gently sloping surface, but a few species begin their nests on a vertical or steeply sloping bank. The only Ceylonese species with the latter unusual site preference are *P.b. basalis* and *C. curculionica*, new species. The other eight species of Ceylonese *Cerceris* whose nests I found began their nests in flat to sloping surfaces of not more than 45°.

The known species of *Philanthus* are quite diverse in their nesting habits, and it is not possible to construct a generalized pattern that applies to all species. Some species construct blind accessory burrows, some make all of the brood cells before storing prey rather than storing prey in the burrow before placing them in the cell, and most species are not at all prey specific but use a number of species of bees or even of other Hymenoptera. *Philanthus b. basalis* does not make accessory burrows, and it shares with *P. triangulum* (Fabricius) the distinction of preying only upon the honeybee. Several prey and one egg are deposited per cell.

The burrow in *Cerceris* species is usually vertical, but angulations may be present especially in species that nest in earth containing pebbles or

roots of plants or bushes. Paralyzed prey is usually brought in and stored in a plug of soil part way down the burrow until enough prey have accumulated to completely store a cell in which a single egg is deposited. However, in several Ceylonese species we found incompletely stored cells with several prey but no wasp egg, suggesting that either these species constructed a holding cell rather than storing prey in a plug of soil in the main burrow, or that the prey were merely taken directly to the brood cell. The cells are constructed a short distance from the bottom of the burrow, sometimes in a radial pattern, but occasionally at different levels from the surface. Females fly directly into the open burrow with their smaller paralyzed prey specimen. Frequently the wasp pushes soil upward with the tip of the abdomen to form a temporary plug at the surface. This is removed, and she leaves the entrance open when she departs for another prey. Species of *Cerceris* are usually not prey specific but prey upon members of a single family; it is most unusual to find representatives of two different families in one nest.

The correlation of structure and function is always a particularly fascinating problem in bio-systematics. The ability of *Cerceris* females to fly swiftly and directly into the burrow while carrying prey requires that the legs be minimally involved in prey carriage. So far as is known, members of the *bupresticida* group prey primarily on buprestid beetles. The females of such species as the Ceylonese *C. bidentula spiniventris* Tsuneki, the European *C. bupresticida* Dufour, and the North American *C. fumipennis* Say have peculiar modifications of the fifth abdominal sternum, which are not found in females of other species groups. These consist of a median shallow to deep concavity behind which is an erect lamella (Figure 89). I believe that these structures function as a buprestid clamp, that the wasp grasps the head of the buprestid in her mandibles, curves the tip of her abdomen beneath and forward so that the abdominal apex of the buprestid rests in the concavity and is prevented from slipping by the erect flange. This clamp functions only with long

slender buprestids such as *Agrilus* species. On a later page I record the inability of a female *C. bidentula spiniventris* to fly into her burrow with her small squat buprestid prey, *Habroloma lalage* Obenberger, instead of the customary *Agrilus* species.

The ultimate in sophisticated buprestid clamps has been developed by the Ceylonese *C. mastogaster* Smith. That female bears erect, sublateral processes on the third to fifth sterna and a median concavity on the fifth sternum behind which is an erect triangular process. Obviously the lateral processes reduce even further the possibility that the prey will slip during transport. In writing of *C. mastogaster*, Turner (1912:506) sapiently remarked that "the structure of the ventral abdominal segment is remarkable, and probably is of assistance to the insect in transporting beetles, perhaps *Buprestidae*."

***Philanthus basalis basalis* Smith**

The Ceylonese bee wolf commonly occurs in Sri Lanka at only a few localities in the hill country. It preys only upon worker adults of the Indian honeybee, *Apis indica* Fabricius, whose hives are exploited for honey by the Ceylonese. Populations of *P. basalis* are so low that it is not a serious predator of honeybees as is the European bee wolf, *P. triangulum* Fabricius. The wasps are longer (10–13 mm) and heavier bodied than their prey (8–10 mm).

We found nesting aggregations only in Udawattakele Sanctuary, Kandy, where the wasps nested in almost vertical banks of a soft sandstone (kudu gala) along several roads in the Royal Jungle. A nest site usually consisted of six to eight burrows whose entrances were separated from each other by at least 15 cm. Burrow entrances were shaded most of the day, but wasps were active from late in the morning until at least 1600 hrs, except during rainy spells. Colonies are probably active throughout the year, for we captured females in Udawattakele during all months except November and December, periods when I did not visit the area. Males were very rare, and we caught only one in May at Teldeniya about

16 km away. This suggests that males may have very short lives, and perhaps that the sex ratio is strongly skewed in favor of females.

Females are very cautious and frequently peer out of the burrow entrance for some minutes before taking flight. A single burrow is sometimes occupied by more than one female. It is not known whether this may represent a female and her eldest daughter(s) or unrelated nesting individuals that may provision their individual cells or share a division of labor. I saw one female hovering in front of a burrow entrance and being prevented from entering by another female inside the burrow. The former flew off and gained entrance a little later when she returned without prey. A female left this burrow at 1430, and another came to the entrance at 1436 and peered out. Apparently cells are cleaned out and reused, for I found parts of old bees outside the entrance to one burrow. Twice we noted a female without prey entering and leaving three different burrows after spending a minute or less inside each.

The burrows were 4.8–6.4 mm in diameter and usually penetrated the rock horizontally or at a slight angle upward or downward. One, apparently just being excavated, went in horizontally for 15.2 cm and did not have a cell. A female without prey entered a burrow that went in at a slight upward angle and ended in a cell at 35.6 cm containing an empty cocoon and bee fragments. Another burrow went downward at a slight angle for 50.8 cm and ended in a cell with a half grown wasp larva and two fresh paralyzed bees; the absence of bee fragments in this cell suggests that *P. b. basalis* may provision progressively, bringing in fresh prey as needed. Still another burrow went upward at a slight angle for 15.2 cm, then turned more sharply upward for 25.4 cm, and then angled downward for 10.2 cm; it contained only a few old bee fragments.

We excavated the longest burrow after seeing a wasp fly into it with prey. The burrow went in horizontally for 25.4 cm curving leftward, then upward at a right angle for 11.4 cm, turned left and upward for 3.8 cm, then downward for 3.8 cm, then horizontally to left for 7.6 cm, right for

2.5 cm, then left at 45° downward for 10.2 cm, and then at a slightly different angle and downward for 12.7 cm. At this distance we found an old cell with empty wasp cocoon and bee fragments 2.5 cm to the left and slightly above the burrow. The burrow then turned upward for 3.8 cm, where we found another old cell with empty cocoon and bee fragments about 2.5 cm from the burrow axis. The burrow then curved to the left for 20.3 cm. We had to abandon our excavation, for the burrow had now penetrated 96.5 cm inward from the face of the bank and ended 38.1 cm left of the entrance.

About 30% of the bees (33 of 112) from Udawattakele bore mite hypopi belonging to a distinctive new species of a genus near *Vidia* (Sargophyidae) on their bodies. The heaviest concentration of mites occurred on the declivous slope of the pronotum and along the pro-mesonotal suture, on the postscutellum and on the base of the first abdominal tergum, but scattered individuals were found on the forewings and thorax. The infestations ranged from about 150 hypopi to only a few individuals. The two old wasp cocoons also bore a few mites on the outside of the walls. The findings are consistent with the probability that the mites are scavengers in the cells rather than being parasites. Cooreman and Crévecoeur (1948) demonstrated that some stages of *Vidia concellaria* Cooreman are scavengers in the nest of *Cerceris arenaria* (Linnaeus) in Belgium.

(Account based on notes 10273 A-D, 2975 A and C, 21175 B, 21275 D, and unnumbered notes made in Oct 1973, Jun and Jul 1976, and Jan 1977.)

Cerceris pictiventris novarae Saussure

This taxon belongs to the *rybyensis* group, other taxa of which have been reported as preying upon solitary bees. Although it is a common wasp, we obtained very little information on nesting and prey. I collected one female (11677 B) 7.3 mm long hovering 2.5 cm above a road with gravelly soil in a coconut plantation at Kurana near Kattunayake Airport at 1250 on 16 Jan 1977; she

was not carrying a prey. P. B. Karunaratne saw a female (32877 C) 8.6 mm long trying to alight on a shallow pile of sand on a path in the Colombo Museum Garden at 1150 on 28 Mar 1977. She tried to dig while holding onto her prey but was disturbed three times. The wasp held the prey venter up and head forward by her mandibles and forelegs and curved her abdomen under the end of the prey to help support it. The prey was a paralyzed male halictid bee, *Nomia (Austromomia) krombeini* Hirashima, 7.0 mm long. Karunaratne dug up the area but could not locate the nest. The Taiwanese subspecies *C. pictiventris formosicola* Strand preys upon *Halictus* bees.

Cerceris bidentula spiniventris Tsuneki

This taxon belongs to the *bupresticida* group, other members of which have also been recorded as preying upon buprestid beetles. It is a rather small form 6.5–8 mm long. All of the prey I obtained were small slender beetles 3.5–6.5 mm long belonging to such genera as *Agrilus*, except for one short, squat, flattened buprestid, *Habroloma* sp., 2.5 mm long in a nest that contained no other prey. All nests were found in soils containing a substantial amount of gravel.

I discovered the first nesting aggregation in the Kanneliya section of the Sinharaja Jungle and observed nesting behavior periodically and dug up several nests during the period 7–11 Oct 1973. About a dozen females were nesting in a gently sloping area of about a square meter in an abandoned logging road, where the soil was packed sandy loam containing a substantial amount of small gravel. I captured two females flying with prey at 1145 and 1330 on 7 Oct; the prey belonged to *Agrilus* sp. 1 and sp. 2, respectively 4 and 6.5 mm long. A third female flew into her burrow at 1330, pushed up some earth to plug the entrance, emerged at 1332, and flew off after making a brief reconnaissance flight low over the area. Her nest entrance was again closed at 1422, so I excavated the burrow and captured the wasp 3.2 cm below the surface. The nest entrance was 4.8 mm in diameter and was surrounded by a

tumulus of earth particles 2.5 cm in diameter and 4.8 mm high in the middle. The burrow went down vertically for 3.2 cm and then turned at 75° to the horizontal for another 3.2 cm; the burrow ended at a depth of 6.4 cm and contained neither cell nor prey; a specimen of *Agrilus* sp. 2, 6.0 mm long, was found on the ground near this nest entrance. A fourth female flew into her burrow with prey at 1453, did not make a temporary plug, and left in 2 1/2 minutes. This burrow was 3.2 mm in diameter, perpendicular to the surface, and I found eight prey 3.5–4.5 mm long in a cell at a depth of 5.1 cm. There was no egg, so the cell probably had not been completely stored; the prey consisted of one specimen each of *Agrilus* sp. 3, 4, and 6, two specimens of *Agrilus* sp. 1, and three specimens of *Agrilus* sp. 7. The last female observed on 7 Oct found her burrow with difficulty at 1500. She entered the burrow head first, turned around and came to the entrance, and reached out and dragged in a small squat *Habroloma lalage* Obenberger 2.5 mm long that she presumably had dropped on the ground near the entrance. I excavated the nest and found nothing but this beetle at a depth of 2.5 cm and two old cells at a depth of about 5 cm containing only beetle fragments.

On 8 Oct I marked a nest, and dug it up on 11 Oct. There was a single cell at a depth of 7.6 cm containing one specimen of *Agrilus* sp. 1, nine specimens of *Agrilus* sp. 7, but no wasp egg. I found and excavated three more nests on the 11th. The first had a perpendicular burrow 6.3 cm deep. The wasp was at the bottom of the burrow with eight *Agrilus*, two of sp. 4 and six of sp. 7, no wasp egg, and elytra, presumably from the old cell, consisting of three specimens each of two species of *Agrilus* and one specimen of a third. A wasp without prey flew into the second nest at 1400. The burrow was vertical for 7.6 cm, and I found only one specimen of *Agrilus* sp. 5 at 6.3 cm, so the wasp had just begun to store the nest. The third nest had a vertical burrow of 5.1 cm with no prey, and the wasp presumably was still digging this nest.

On 16 Jan 1975 we found a smaller colony of

this wasp in another area of the Kanneliya section of the Sinharaja Jungle. The six nests were in a road with hard sandy loam containing a lot of gravel and occupied an area of about a third of a square meter. Three nests had a low tumulus of excavated soil surrounding the entrance, and a fourth lacked this mound. Two burrows were vertical for 6.3 and 7.6 cm, then at an angle of 45° for another 2.5 cm. The fourth was vertical for 3.8 cm, at an angle of 45° for 1.9 cm, and then vertical for 1.3 cm. Apparently the wasps were still digging the nests, for we found neither cells nor prey.

We found a third smaller aggregation of *C. b. spiniventris* at Labugama Reservoir on 11 Jul 1978. The nests were in the road running across the head of the reservoir, and the soil was very compact and contained many small rocks. The three nests all had a low tumulus of earthen grains 7–10 mm high in the center and 20–30 mm in diameter surrounding the burrow entrances, which were 3–4 mm in diameter. Two nests were incomplete, for they contained neither a completed cell nor prey; both were vertical for 2.8 and 3.0 cm, continued at 45° for 2.4 and 2.8 cm respectively, and then turned vertically for 5.4 and 3.6 cm; one burrow had a subsidiary horizontal burrow 2.6 cm long at a level of 3.0 cm, which may have been intended as a holding cell. I captured the female that was returning without prey to the third nest. This burrow penetrated vertically for 3.6 cm, angled downward at 45° for 1.9 cm, and then angled in another direction at 60° for 5.2 cm. Four beetles belonging to *Agrilus*, new species, were in the main burrow at a depth of 8.5 cm. At a depth of 10.5 cm we found a completed cell but injured the small wasp larva, which had fed on some of the prey. The cell contained 19 slender buprestids 2.5–5.0 mm long identified as follows: four *Aphanisticus shiganus* Obenberger, one *Aphanisticus arcuaticollis* Motschulsky, one *Meliboeus uzeli* Obenberger, two *Agrilus moderator* Obenberger, six *Agrilus* sp. in the *iligonensis* Fisher group, four *Agrilus*, new species, and one *Agrilus* sp. too damaged for identification.

I noted a potential parasite only once. On 17

May 1976 I saw a female wasp flying toward her burrow in a gravelly slope of 45° near the beach at China Bay, Trincomalee. She was being followed closely by two female satellite flies (Miltogramminae), which probably intended to larviposit in her nest. The wasp was just starting her nest, for the burrow penetrated at a 45° angle and ended 1 cm below the surface.

(Account based on notes 10773 A-D, F, G, 10873 F, 101173 A-C, 11675 A-D, 51776 A, and 71178 A-C.)

Pagden (1934:476) published brief notes on *C. b. bidentula* Maidl (as *C. langkasukae* Pagden). He found a colony nesting in Malaya in compacted sandy soil, but he excavated no nests, so it is not known if the soil contained gravel. He took buprestid prey from a number of female wasps that belonged to three species of *Agrilus* and one species each of *Anthaxia* and *Trachys*. He obtained an unusual prey from one female, a male of the crabronid wasp *Hingstoniola*.

Cerceris dissecta (Fabricius)

This and the following three species belong to the *rubida* group, members of which have been reported to prey upon several families of beetles. *Cerceris dissecta* is unusual in that occasionally it preys upon both adult Chrysomelidae and Curculionidae. The normal prey appears to be Chrysomelidae, but I found one 3-celled nest in which one cell contained a mixture of flea beetles and weevils, predominantly the former family, suggesting that weevils may be stored only when there is an insufficiency of the preferred prey. Females of *C. dissecta* are 5.5–7.0 mm long. I found the first nest on the level bund of Palatupana tank at the entrance to Ruhunu National Park in southeastern Sri Lanka. On 6 Feb 1975, at noon, P. B. Karunaratne noted a female fly into its burrow with prey. She emerged in a few seconds, flew off, and returned without prey at 1210, and I captured her. The burrow entrance had a small, low tumulus surrounding it, the burrow diameter was 2 mm, and the sand was hard-packed and moist beneath the dry surface.

The burrow went downward at an angle of 75° for 7.6 cm. There were some small beetle fragments at this level. A larger female emerged from the burrow when we had excavated to this depth. The burrow then continued at 75°, but in a different direction, for 2.5 cm. At 1230 I captured a third small female as she tried to enter the burrow. The burrow then angled again, still at 75°, and now in line with the original axis for 3.8 cm. We found a horizontal cell at a depth of 15.2 cm, which contained a fusiform cocoon 8 mm long with 38 elytra and 19 heads of a *Chaetocnema* sp. adhering to the cocoon. At the same depth but in a different direction we found another cocoon of the same size containing a black-eyed pupa and 22 elytra and six heads of the same prey adhering to the outer surface of the cocoon.

On the following day at Angunakolapelessa I saw a female *C. dissecta* fly into her burrow at 1111. The nest was in flat, hard-packed sand on a gravelly road. The burrow entrance was 2 mm in diameter and was not surrounded by a tumulus of excavated soil. The burrow went downward almost vertically for 12.7 cm. At that level we found an old cell with cocoon fragments and 33 elytra of two species of *Chaetocnema*. Another old cell at the same level 1.3 cm from the burrow axis contained 59 elytra and three weevil snouts; there were two or three species of *Chaetocnema* among the chrysomelid remains and nine weevils of a species of *Echinocnemus*. A third old cell at the same level and 1.3 cm from the burrow axis in another direction contained 28 chrysomelid elytra and 19 head capsules of one or two species of *Chaetocnema*.

We found the most complete nest on a gentle slope on the edge of the bund at Palatupana tank on 21 Jun 1978. At 1000 I noted the female flying low over the ground, from side to side, and then entering the burrow. I captured her when she emerged 5 minutes later. The entrance was 4 mm in diameter, and the burrow penetrated the dry, compacted, sandy soil at an angle of 45° for 3.5 cm. At that level there was at one side an empty horizontal cell, which perhaps was a holding cell for prey as it was brought in. At 3.5 cm the

burrow went vertically to a depth of 12.5 cm where we found a horizontal cell 1 cm from the burrow axis and with an earthen plug between it and the main burrow. The cell was ovoidal, 6 mm long and 4 mm wide in the middle, and contained 32 flea beetles 1.8 mm long and an unattached, slightly curved wasp egg 1.8 mm long and 0.5 mm wide. At a level of 12.7 cm there was an empty cell of the same dimensions. Another stored cell of the same dimensions was found at 12.8 cm and 2–3 cm from the burrow axis; it contained a newly hatched wasp larva 1.3 mm long and 0.5 mm wide and 27 flea beetles 1.5–1.9 mm long. Another stored cell of the same dimensions was at a depth of 17.8 cm; it contained 34 flea beetles, some whole and some represented by elytra and empty thoraxes, but we lost the wasp larva. All of the prey belonged to the genus *Chaetocnema* as follows: cell 1, 2 *C. sp. # 2*, 4 *C. sp. # 3*, 25 *C. sp. in cognata* Baly group, and 1 *C. sp. near concinnipennis* Baly; cell 2, 1 *C. sp. # 1*, 23 *C. sp. in cognata* group, and 3 *C. sp. near concinnipennis*; and cell 3, 30 *C. sp. in cognata* group and 4 *C. sp. near concinnipennis*.

(Account based on notes 2675 A, 2775 B, and 62178 A.)

***Cerceris vischnu vischnu* Cameron**

I found a small aggregation of about four females in Mar 1981 in the shaded Badegamuwa Jungle near Kurunegala. They were flying around a coarse sand bank about 0.3 m high at the edge of a dry, sandy, intermittent stream bed. I collected the first female about noon flying low over the ground without prey. I saw the second female 9.0 mm long (31481 A) at 1237 on a fallen leaf on the ground with her bulky paralyzed chrysomelid prey, *Dercetina flavescens* Allard, 7.5 mm long. She grasped it and began to fly with difficulty. I collected her with prey, fearing that I might lose sight of her. The beetle prey was thoroughly paralyzed, but by 1630 it could flex its antennae and tarsi weakly.

A few minutes after capturing the wasp with prey, I realized that the flat surface of this bank

was the nesting site, for I saw a third preyless female flying low over the bank searching for her nest entrance, which may have been obscured by my tramping over the area. Finally she began to burrow into a slope of about 40° and penetrated until only her abdomen was visible. Then she flew off, and I saw the head of another female at the entrance. I left for half an hour and returned at 1340 to find the second female still resting with her head several mm inside the burrow entrance. I dug up the burrow, which went downward at an angle of 75° to the horizontal for 4 cm and then turned at the same angle for another several cm, where I found the female at the end of the uncompleted nest.

***Cerceris eumolpicida*, new species**

I found a small aggregation of about six females nesting in a sloping mud bank of 45° at the edge of a dry, sandy, intermittent stream bed at Angunakolapelessa during Jan 1979. I collected one female 7.0 mm long (12179 B) without prey at noon on 21 Jan. I checked the nesting site occasionally, and on the following day I captured a second female (12279 B) with her prey at 1215. I released the wasp and kept the small, paralyzed, chrysomelid beetle 2.2 mm long. The prey was identified subsequently as Eumolpinae, *Colposcelis* species.

***Cerceris bifasciata* Guérin**

P. B. Karunaratne captured a female (12379 C) 10 mm long on foliage at Angunakolapelessa at 1630 on 23 Jan 1979. She had just captured her weevil prey, an adult *Myloccerus viridans* (Fabricius) 5 mm long.

***Cerceris specifica* Turner**

This is a member of the *alboatra* group, and its flea beetle prey is the only prey record for species assigned to this group. It is a relatively slender species 8.5–9.0 mm long. Although it is widely distributed in Sri Lanka and occurs also in South

India, I obtained ethological data only in areas of higher elevation around Nuwara Eliya. My first prey record was from the Galway Natural Reserve in Nuwara Eliya at noon on 5 Mar 1972 when I captured a female (3572 A) carrying its paralyzed chrysomelid prey, a flea beetle, *Basilepta* sp. near *clypeatum* (Jacoby). On 2 Jun 1976 I discovered an aggregation of about a dozen females nesting in an area of about a square meter in a power line cut running through the Hakgala Natural Reserve at an altitude of 1800 m. The soil was quite moist even near the surface, and excavation of the nests was made difficult by many small roots of grasses and shrubs, some with a diameter as large as 10 mm. I kept only two wasps flying with paralyzed prey and released others after taking their prey; altogether I made notes on 11 wasps (6276 A-K). All prey were flea beetles belonging to three species: *Nodina* sp., 2.0–2.3 mm long, *Basilepta* sp. near *clypeatum* (Jacoby), 2.0–3.8 mm long, and *Colposcelis* sp. near *ceylonensis* Maulik, 3.5 mm long. *Nodina* was the most common, and I recovered four paralyzed beetles from wasps and found fragments of the same species in two nests; only two paralyzed beetles of each of the other two species were taken from wasps. Some prey exhibited weak tremors of the antennae and tarsi.

The burrow entrances were surrounded by a tumulus of earth particles 3 cm in diameter and 1 cm high in the middle. The burrows were 2.5 mm in diameter. I saw one female fly into a burrow, but could not see whether she carried prey. Her burrow was perpendicular for 1 cm, then turned at 80° to the horizontal. I found a horizontal cell 1 cm long and 3 cm in diameter at a depth of 12 cm and about 1 cm from the burrow axis; it contained *Nodina* fragments. There was a second cell of the same dimensions at the same depth and about 1 cm from the burrow axis in a different direction; it contained a wasp cocoon with adherent *Nodina* fragments. A second burrow went downward at an angle of 80° to the horizontal and ended at a depth of 16 cm. At 17 cm I found an old cell with *Nodina* fragments, and 2–3 cm away I recovered an entire cocoon with

adherent *Nodina* fragments. All nests were in soil with a slightly sloping surface.

Cerceris conifera, new species

This wasp belongs to the new monotypic *conifera* group, which preys upon adult Eucharitidae (Chalcidoidea), parasites of ant pupae. Females of *Cerceris conifera* are 7.5–9.5 mm long.

I captured the first female with prey (61776 A) on the foliage of a shrub in the Induruwa Jungle, Gilimale, at 1015 on 17 Jun 1976. The paralyzed male prey, *Chalcura deprivata* (Walker), 3.5 mm long, was able to vibrate its mouthparts and legs feebly. S. Karunaratne captured two females of *Cerceris conifera* on flowers on 19 Jun; the wasps may have been searching for prey or visiting the flowers for nectar. A small aggregation of the wasp was nesting in a jungle path rather open to the sun in well-compacted soil occasionally overlaid by 1–2 cm of alluvial sand. On 19 Jun we excavated a nest from this aggregation. The burrow was vertical for 7.5 cm and 3–4 mm in diameter. At that depth we cut the wasp in half with the trowel and found two paralyzed *Chalcura deprivata* females. On 22 Jun I noted another nest in this aggregation, which had the burrow entrance closed at 0930 and open by 1030, indicating that the wasp had left. There was a tumulus of sand grains 30 mm in diameter and 5 mm high in the center around the entrance. The burrow was 3 mm in diameter and vertical to a depth of 13.6 cm, where it angled off for 4 cm. At a depth of 20 cm and in direct line with the main burrow axis, we found a *Cerceris* cocoon 9 mm long with many adherent chalcidoid fragments and containing a wasp pupa. About 2.5 cm from the first cell and 1 cm deeper, there was a second horizontal cell, 10 mm long and 4 mm wide; the *Cerceris* larva was cut in half by the trowel and we recovered more whole paralyzed *Chalcura deprivata* 2.7–3.4 mm long. A third cell was in line with the oblique section of the burrow. It contained a few chalcidoid fragments, which suggests that perhaps *Cerceris conifera* reuses an old burrow as does *Philanthus b. basalis*, or that some offspring may

emerge as adults while their mother is still storing new cells. A fourth cell was 3 cm from the end of the main burrow axis and contained six whole fresh paralyzed *Chalcura deprivata*, five females and one male, but no wasp egg or larva.

We found the last nest in a level jungle path open to the sun at the base of Sigiriya Rock on 29 Jun 1978. At 1415 P. B. Karunaratne caught a female of *Cerceris confiera* as she emerged from the burrow. As we began the excavation, a second female 9.5 mm long left the burrow. The burrow was 4 mm in diameter and went down vertically for 8.0 cm. At a depth of 9.5 cm and 1 cm from the burrow axis, and not connected with the main burrow, we found an old cell with cocoon and chalcidoid fragments. At 8.0 cm the burrow turned horizontally for 2.0 cm. We found four cells at this distance from the main burrow axis at depths of 8.5, 9.0, and 11.5 cm. All were open to the horizontal section of the burrow. Three contained fragments of cocoons and chalcidoid prey, and the fourth contained a complete fusiform cocoon 11 mm long with a dead prepupa and adherent prey fragments. The prey fragments from these four cells were identified as *Chalcura deprivata* and *Schizaspidia* sp., possibly *convergens* (Walker). Our capture of two females from this nest and failure to find fresh prey suggests that both were newly emerged females from two of the four cells open to the horizontal section of the burrow.

(Account based on notes 61776 A, 61976 F, 62276 A, and 62978 A.)

***Cerceris curculionica*, new species**

This is the only known member of the *curculionica* group, and it preys upon weevils. It has the unusual habit for a *Cerceris* of nesting in nearly vertical banks instead of the more usual flat or gently sloping ground. I collected two females 9.0 and 9.5 mm long in Udawattakele Sanctuary, Kandy. The former (21275 B) was hovering in front of a nearly vertical bank of soft sandstone (kudu gala) at 1255 on 12 Feb 1975. She was carrying her paralyzed weevil prey, *Myloccerus* sp.,

4 mm long. I caught the second (91077 C) without prey as she hovered in front of a similar bank at 1445 on 10 Sep 1977. I have no data on the nest architecture of *C. curculionica*. The burrow may be more or less perpendicular to the surface of the bank as in *Philanthus basalis*. However, in North America I observed *C. flavofasciata* H. S. Smith, both the typical subspecies and *C. flavofasciata floridensis* Banks, nesting in vertical sand banks and provisioning with adult chrysomelid beetles (Krombein, 1959:197, 198; 1964:20–22). The burrows of both taxa curved downward from the vertical surface of the bank, so it is possible that the nest of *C. curculionica* will have similar architecture rather than being excavated horizontally.

***Cerceris tetradonta* Cameron**

This belongs to the *albofasciata* group, one other species of which also preys upon tortoise beetles. I found two nests of *C. tetradonta* (12677 B and C) at Kilinochchi on 26 Jan 1977. There were no other nests at this site, a hard-packed sandy loam path through an open field. I noted the first female 8.5 mm long at 1130 flying with her bulky prey 2.5 cm above the road. After some searching she found the burrow entrance and carried in the prey. I captured her when she emerged a few seconds later. The burrow entrance was next to a root, and there was no tumulus surrounding it. The burrow went down at an angle of 75° to the horizontal for 7.6 cm, where we found a paralyzed tortoise beetle 5 mm long. We enlarged the excavation to a depth and diameter of 15.2 cm but found no cells. The wasp had unworn mandibles, so she may have just begun to nest. The prey was still completely paralyzed at 1300. I saw the second female 8 mm long at 1250 hovering 2.5 cm above the ground. She darted quickly into the burrow with her bulky prey, and I captured her when she emerged in a few seconds. This burrow entrance was surrounded by a low tumulus of soil particles. The burrow penetrated at an angle of 75°–80° to the horizontal. We found the first cell at a depth of 7.6 cm and 2.5 cm from the burrow axis. It contained five tortoise beetles but no egg,

and it may have been a holding cell. A second cell was 2.5 cm below the first; it held eight beetles, and an egg, if present, was dislodged or crushed during our excavation. A third cell was at the same depth and about 1.3 cm from the second. It contained ten beetles with a tiny, newly hatched wasp larva on the sternum between the legs of one beetle. All cells were spheroidal and 10 mm in diameter. All prey were the chrysomelid *Cassida* sp. near *ellipticollis* Spaeth 4.5–5.2 mm

long. In both nests the soil was moist but still very firm 2.5 cm beneath the surface.

Tsuneki (1965:28–31) reported that in Japan and Korea, *C. albofasciata* Rossi of the same species group preyed upon several species of *Cassida*. He found six cells in an uncompleted nest with the cells surrounding the main burrow at a short distance and at depths of 9.0–13.7 cm. Cells were stocked with 7–10 prey.

Key to Ceylonese Philanthidae

1. Eye reniform in outline, the inner margin emarginate (Figure 1); apex of hind femur simple, not thickened; second submarginal cell of forewing not petiolate, more or less trapezoidal; first abdominal segment with sides gradually diverging, at apex not substantially narrower than second segment. *Philanthus* Fabricius 1. ***Philanthus basalis basalis*** Smith
- Inner eye margin convex, not emarginate (Figure 3); apex of hind femur thickened, reniform in outline; second submarginal cell petiolate above, triangular; sides of first abdominal segment parallel or slightly rounded outwardly in middle, apex decidedly narrower than base of second segment. *Cerceris* Latreille 2
2. FEMALES: Antenna 12-segmented; abdomen 6-segmented 3
 MALES: Antenna 13-segmented; abdomen 7-segmented 18
3. Ventral surface of hind coxa with a sharp carina along nearly entire length of inner margin (Figure 50) 4
 Ventral surface of hind coxa rounded along inner margin (Figure 51), or with only a very short basal carina in *C. tetradonta* and *C. i. interstincta* 15
4. Clypeus without a projecting discal process (Figures 5, 6); triangular propodeal enclosure glossy, with a median groove and scattered minute punctures 5
 Clypeus with a projecting discal process, either a strong median, conical tubercle (Figures 11, 12), or a low transverse lamella (Figures 16, 17), or a pair of teeth just above clypeal margin (Figures 13–15); propodeal enclosure not glossy, more coarsely and closely punctate or rugulose except in *C. dissecta* 8
5. Clypeus with margin of apical lobe broadly rounded, above lobe with a deep, broad transverse impression (Figures 3, 4); abdominal markings ivory, rarely yellowish, those on terga consisting of a pair of small spots on base of second, narrow apical fascia on third, pair of widely separated, transverse spots on apex of fourth, and a narrow apical fascia on fifth narrowly interrupted on midline 3. ***Cerceris intrusa***, new species

- Clypeus with margin of apical lobe truncate, not deeply transversely impressed above lobe (Figures 5–10); abdominal markings yellow or ivory 6
6. Clypeus shallowly concave above truncation of median lobe (Figures 5, 6); pale markings ivory and reduced, pronotal disk, scutellum, and postscutellum with paired spots, third and fifth abdominal terga each with narrow apical fascia 5. *Cerceris wickwari* Turner
- Clypeus flat or slightly convex above truncation of median lobe; pale markings yellow and more extensive, pronotum and propodeum with paired spots, usually scutellum and postscutellum banded, at least base of second tergum and apices of third and fifth each with a broad fascia, those on three and five narrowed anteriorly toward midline 7
7. Supraclypeal area strongly swollen, protruding beyond interantennal keel (Figures 7, 8); pygidium (Figure 37) comparatively shorter and broader; lower margin of upper part of mesopleuron not carinate; first abdominal segment black as is the fourth tergum; thorax and abdomen with less extensive, brighter yellow markings 4. *Cerceris pictiventris novarae* Saussure
- Supraclypeal area not strongly swollen, not protruding beyond interantennal keel (Figures 9, 10); pygidium (Figure 38) comparatively longer and narrower; lower margin of upper part of mesopleuron strongly carinate; first abdominal segment red, second through fifth terga broadly yellow especially at sides; thorax and abdomen with more extensive, paler yellow markings 2. *Cerceris protea* Turner
8. Clypeus with a strong, erect, conical tubercle in middle (Figures 11, 12); propodeal enclosure with oblique rugulae on basal two-thirds, transverse rugulae on apical third; basal abdominal segment black 14. *Cerceris conifera*, new species
- Clypeus with a low transverse lamella or pair of teeth just above clypeal margin; propodeal enclosure not so sculptured, irregularly rugulose, or coarsely or finely punctate; basal abdominal segment red in part or entirely except in *C. v. vischnu* and some specimens of *C. dissecta* 9
9. Clypeus with a pair of close-set teeth above apical margin (Figures 13–15); fifth sternum either with a small acute posterolateral tooth and a deep, median circular fovea margined posteriorly by a rounded, erect subapical lamella (Figure 89), or with a large, erect sublateral process with truncate apex, the median area broadly and shallowly concave and margined posteriorly by a large, erect angulate lamella 10
- Clypeus with a low transverse lamella above apical margin, terminating laterally in a blunt tooth (Figures 16, 17); fifth sternum without a lateral or posterolateral process, the surface flat or slightly convex 11
10. Fifth abdominal sternum with a small, acute posterolateral tooth and a deep, median circular fovea margined posteriorly by a rounded, erect subapical lamella; propodeal enclosure finely roughened; apex of forewing faintly infumated; propodeum and hind femur black 6. *Cerceris bidentula spiniventris* Tsuneki

- Third to fifth abdominal sterna each with a large, erect, apically truncate process near side; fifth sternum broadly and shallowly concave and with a large, erect, angulate process posteriorly; propodeal enclosure smooth except for a few fine wrinkles at extreme base; apex of forewing with a strong infuscation; propodeum except enclosure and hind femur in part red 7. *Cerceris mastogaster* Smith
11. Propodeal enclosure glossy with a median groove, elsewhere with fine scattered punctures; pygidium with basal and apical widths subequal (Figure 41); ground color of abdomen black, but first and part of second segments red in some specimens; pale markings white, second tergum with a subbasal transverse spot, apical fascia on third narrowly interrupted in middle and broader at sides, fifth tergum with a transverse apical band not reaching sides; smaller species, 6.5–7.5 mm long 8. *Cerceris dissecta* (Fabricius)
- Propodeal enclosure irregularly rugulose or more coarsely and closely punctate; pygidium with basal width greater than apical (Figures 42–45); abdominal coloration differing in some details from that of *C. dissecta*; larger species except some specimens of *C. p. pulchra*, which are as small as *C. dissecta* 12
12. Pale markings quite reduced, clypeus black in part, thorax at most with a small lateral spot on pronotal disk and median spot on postscutellum, abdomen at most with small median, basal or apical spot on second tergum, third tergum with narrow apical fascia, fifth tergum with apical spot or short band and third sternum with broad band; forewing with weak diffused infuscation in and beyond marginal cell 13
- Pale markings more extensive, clypeus entirely pale, thorax at least with pronotal disk except narrowly in middle, and disk of postscutellum, abdomen with large basal spot on second tergum, broader apical fasciae on third and fifth terga and broad band on third sternum; forewing with strong, well-defined infuscation beyond marginal cell 14
13. Head (Figure 18) with width 1.8 times the height from apex of clypeus to anterior ocellus, clypeus 4.0 times as wide as apical width of process; thorax entirely black except ivory spot on tegula, second abdominal tergum black, rarely with a tiny median ivory spot at apex; pygidium (Figure 42) comparatively narrower, 1.9 times as long as greatest width; first abdominal segment 0.9 times as wide as long 9. *Cerceris vischnu vischnu* Cameron
- Head (Figure 20) with width 2.1 times the height from apex of clypeus to anterior ocellus, clypeus 2.5 times as wide as apical width of process; pronotal disk with a small lateral ivory spot, tegula with spot, second abdominal tergum with a transverse median spot at base; pygidium (Figure 43) comparatively broader, 1.6 times as long as greatest width; first abdominal segment 1.1 times as long as wide 10. *Cerceris eumolpicida*, new species
14. Smaller species, 6.5–7.5 mm long; vertex, occiput, cheeks, mesopleuron, scutellum and propodeum black, legs mostly yellow with limited black

- areas; head (Figure 22) comparatively narrower, width 1.7 times the height from apex of clypeus to anterior ocellus, mandible with a single weak, obtuse tooth on inner margin near middle
- 12. *Cerceris pulchra pulchra* Cameron
- Larger species, 8.5–10.0 mm long; vertex with a narrow transverse yellow band, occiput (usually) and temples with a similar band, which is interrupted in middle, mesopleuron, scutellum, and propodeum maculated with yellow, the latter otherwise red except for black enclosure (yellow markings reduced or absent when ground color is mostly red rather than black); head (Figure 24) broader, width 2.0 times height, mandible with two strong acute teeth near middle of inner margin ...
- 11. *Cerceris bifasciata* Guérin
15. Clypeus (Figure 26) without a discal process, margin of median lobe with four rounded teeth; pale markings white, those on abdominal dorsum consisting of paired spots on first to fifth terga; propodeal enclosure glossy, impunctate, median groove evanescent
- 16. *Cerceris tetradonta* Cameron
- Clypeus (Figures 28–34) with a projecting discal process, margin of median lobe with three or five projections; pale markings yellow, those on abdomen consisting of fasciae except in *C. i. interstincta*, which has paired spots on second through fourth terga and a band on the fifth, fourth rarely spotted
- 16
16. Pygidium (Figure 47) with apical margin broadly and shallowly emarginate; clypeal process arising from base of clypeus (Figures 28, 29), as long as basal width, sides diverging slightly from base; inner margin of mandible with two teeth; second to fourth abdominal terga with paired spots, fifth with a broad band
- 17. *Cerceris interstincta interstincta* (Fabricius)
- Pygidium (Figures 48, 49) with apical margin slightly rounded out or subtruncate; clypeal process broader at base than long, the sides converging slightly toward apex; second, third, and fifth terga or second through fifth each with a band, fourth rarely spotted
- 17
17. Propodeal enclosure glossy and with small punctures, median groove evanescent; apical margin of median clypeal lobe quinque-dentate, process arising in middle of clypeus (Figures 30, 31); mandible with two teeth on inner margin; first abdominal segment slender, 1.6 times as long as greatest width
- 13. *Cerceris specifica* Turner
- Propodeal enclosure with close radiating rugulae on basal two-thirds, transverse rugulae on apical third, median groove evanescent; apical margin of median clypeal lobe with a weak, blunt lateral tooth and a broad central process terminating laterally in an acute tooth, process arising at base of clypeus (Figures 32–34); mandible with a single tooth on inner margin; first abdominal segment with length and greatest width subequal
- 15. *Cerceris curculionida*, new species
18. Ventral surface of hind coxa with a sharp carina along nearly entire length of inner margin (Figure 50); second abdominal sternum with a

- raised, more or less semicircular platform at base that is sometimes very weak; last flagellar segment not strongly curved beneath, tip not truncate 19
- Ventral surface of hind coxa rounded along inner margin (Figure 51), or with only a very short basal carina in *C. i. interstincta* and *C. tetradonta*; second abdominal sternum flat at base, without a raised platform; last flagellar segment usually curved beneath and truncate at tip except in *C. specifica* 30
19. Sixth abdominal sternum with an acute posterolateral tooth, sixth tergum with a weaker blunter posterolateral tooth (Figures 71, 73) 20
- Sixth abdominal sternum not dentate, at most with a low, blunt tubercle 21
20. Clypeus white except for narrow apical rim; outer surface of all tibiae white; second tergum with pale basal fascia, third and sixth with apical fasciae; forewing with a large well-defined infuscated spot beyond marginal cell 7. *Cerceris mastogaster* Smith
- Clypeus with a broader black apical band, lateral lobe black on apical half or two-thirds; outer surface of fore and mid tibiae creamy, hind tibia pale only at base; second tergum with a pair of small basal pale spots, third and sixth with apical fasciae; forewing with only a small vague infumated area at tip 6. *Cerceris bidentula spiniventris* Tsuneki
21. White to yellow markings on abdominal dorsum occurring only on second, third, and fifth or sixth terga, rarely reduced to a pair of tiny yellow dots on base of second in *C. conifera* or entirely lacking in *C. intrusa* 22
- Pale markings on abdominal dorsum not as described above, either lacking on second or sixth tergum, or present on more than second, third, and sixth terga 25
22. Propodeal enclosure glossy, with a few punctures and a median groove; head (Figures 54, 55) narrower in comparison to height; lateral fimbria of waxy hairs on clypeal margin one-fifth to one-third clypeal width 23
- Propodeal enclosure rugulose, impunctate; head (Figures 56, 57) wider in comparison to height; lateral fimbria of waxy hairs on clypeal margin one-third clypeal width 24
23. Clypeal fimbria one-fifth clypeal width (Figure 54); clypeus pale except narrow apical rim; thorax with pale spots on pronotum, tegula and postscutellum; first abdominal segment and base of second except median spot black or red 8. *Cerceris dissecta* (Fabricius)
- Clypeal fimbria one-third clypeal width (Figure 55); clypeus and thorax black except a small spot on tegula; no red on basal abdominal segments 3. *Cerceris intrusa*, new species
24. Pale markings yellow, clypeus entirely so, pronotum with a pair of large spots, tegula with a large spot, postscutellum spotted or banded, mid and hind coxae and trochanters yellow; base of clypeus strongly swollen (Figure 56) 14. *Cerceris conifera*, new species

- Pale markings white or yellow, clypeus black except median spot, pronotum with a pair of small spots, tegula with a small spot or entirely black, postscutellum black, mid and hind coxae and trochanters usually red, rarely dark 10. *Cerceris eumolpicida*, new species
25. Pale markings lacking on second abdominal tergum, present at most on third, fifth, and sixth 26
- Pale markings present on at least second, third, fifth, and sixth terga unless one or more of these segments are erythristic as in some *C. bifasciata* 27
26. Lateral fimbria of waxy hairs on clypeal margin one-fifth clypeal width, margin of median lobe truncate (Figures 58, 68); first abdominal segment and base of second red, third, fifth, and sixth terga each with a narrow ivory fascia at apex; clypeus pale except narrow apical rim; mandible with a large subbasal tooth on inner margin 5. *Cerceris wickwari* Turner
- Lateral fimbria one-third clypeal width, margin of median lobe weakly tridentate (Figures 59, 69); abdomen not red, third and sixth terga each with a narrow apical fascia or spot; clypeus black; coxae, trochanters, and basal half of femora red; mandible not toothed on inner margin near base 9. *Cerceris vischnu vischnu* Cameron
27. Second abdominal sternum with a low, more or less semicircular, basal platform, which in profile merges gradually with the posterior area; propodeum without a pair of pale spots except in some erythristic specimens, black with varying amounts of red; apical margin of clypeal lobe tridentate (Figure 60) 11. *Cerceris bifasciata* Guérin
- Second sternum with well-developed basal platform, which in profile is abruptly declivous to the posterior area; propodeum black with a pair of yellow spots except in *C. pulchra*; apical margin of clypeal lobe subtruncate, tridentate only in *C. pulchra* 28
28. Clypeus (Figure 61) with apex of median lobe tridentate, the lateral lobes black and densely hirsute, the fimbria of waxy hairs short, restricted to lateral half of lobe; propodeum black, enclosure rugulose along sides and with a median groove; first abdominal segment at least on sides and usually basal half of second red except for pale spot on tergum 12. *Cerceris pulchra pulchra* Cameron
- Clypeus (Figures 62, 63) with apex of median lobe subtruncate, yellow except for narrow apical rim, fimbria of waxy hairs broader extending over more than half the lateral lobe; propodeum with a pair of yellow spots, enclosure glossy, with small punctures and a median groove. . 29
29. Supraclypeal area strongly produced, in profile extending beyond interantennal carina; temple, mesopleuron, scutellum, first and fourth abdominal terga entirely black; tegula with micropunctures and extremely few larger ones; lower margin of upper part of mesopleuron not carinate 4. *Cerceris pictiventris novarae* Saussure
- Supraclypeal area not produced beyond interantennal carina; temple with a small yellow spot, mesopleuron with two spots, scutellum with a band, and fourth tergum with a pair of large, transverse yellow spots,

- first segment red; tegula with numerous large punctures; lower margin of upper part of mesopleuron strongly carinate 2. *Cerceris protea* Turner
30. Propodeal enclosure glossy, impunctate, without median groove; first or second through sixth abdominal terga with paired pale spots, those on sixth broadly joined on midline in *C. i. interstincta*; first abdominal segment short and broad, length 0.8 times maximum width 31
- Propodeal enclosure with relatively numerous tiny punctures or with rugulae, and with a weak median groove posteriorly; at least third and sixth terga each with a narrow apical pale fascia, at most the fourth with paired spots; first abdominal segment slender, length 1.3–2.3 times greatest width 32
31. Pale maculations white, first through sixth abdominal terga with paired, well-separated, transverse spots, first tergum rarely red on other than base; forewing with a narrow, weak apical infumation; mandible without a large subbasal tooth on inner margin (Figure 64) 16. *Cerceris tetradonta* Cameron
- Pale maculations yellow, first abdominal segment entirely red, second through fifth terga with larger paired spots very narrowly separated on midline, sixth tergum with a broad fascia; mandible (Figure 65) with a large subbasal tooth on inner margin 17. *Cerceris interstincta interstincta* (Fabricius)
32. Propodeal enclosure with numerous fine punctures; clypeus except lateral lobes evenly convex; last flagellar segment simple; sixth abdominal sternum not more densely setose posterolaterally than elsewhere; first abdominal segment very slender, 1.7–2.3 times as long as greatest width; second abdominal tergum with a basal pale fascia, third and sixth each with an apical fascia, fourth without narrow apical fascia except in a few specimens where black ground color has been replaced by red 13. *Cerceris specifica* Turner
- Propodeal enclosure with radiating rugulae on basal two-thirds, weaker transverse rugulae on apical third; basal two-thirds of clypeus more strongly convex; last flagellar segment curved beneath, truncate at tip; sixth abdominal sternum (Figure 88) more densely setose posterolaterally than elsewhere; first abdominal segment 1.3 times as long as wide; second tergum with a median spot or pair of tiny spots at base, third, fifth, and sixth each with an apical fascia, fourth with a pair of transverse spots joined on midline in one specimen, ground color black only 15. *Cerceris curculionida*, new species

Subfamily PHILANTHINAE

1. *Philanthus basalis basalis* Smith

FIGURES 1, 2

Philanthus basalis Smith, 1856:473 [♀; Ceylon; type in London].—Walker in Tennent, 1861:454 [listed].—Motschul-

sky, 1863:23 [listed].—Smith, 1871:371 [listed].—Cameron, 1890:248.—Kohl, 1891:363.—Bingham, 1896:446 [listed].—Bingham, 1897:296.—Dalla Torre, 1897:483 [listed].—Vecht, 1966:424, 425, figs. 1c, 3a–c [♀, ♂; Ceylon, Bombay, South India; redescribed].—Bohart and Menke, 1976:564 [listed].

Philanthus basalis is a polytypic species, the typ-

ical subspecies of which has a limited distribution in Sri Lanka and southern and western India (Vecht, 1966:425). It occurs at several localities in the hill country of Sri Lanka at altitudes of 1500–2100 ft and moderate rainfall and at one locality in the Dry Zone at about 50 ft. The distribution in southern and western India is at similar altitudes in hilly country.

There are a number of specimens of an undescribed deserticolous subspecies from Abu, Rajasthan, India, and Deesa, Gujarat, India, in the Washington and London collections. This taxon differs from typical *P. basalis* in having the femora and first abdominal segment light red, and white rather than yellow to ivory maculations.

I have seen the unique holotype male of *P. basalis clypeatus* Tsuneki (1963:26, fig. 55) from Chiangmai in the hill country of northern Thailand. The clypeus is entirely yellow rather than having a median black spot as in males of the other two subspecies, and the markings on the front are larger. The first abdominal segment is entirely red without pale spots, but the legs have no red. The second to fifth abdominal terga have a narrow apical pale fascia. The clypeal teeth are not stronger than in typical *P. basalis* or the other subspecies.

FEMALE.—Length 11.0–13.5 mm. Black, base of first abdominal segment and femora in varying degrees reddish, the following yellow to ivory: base of mandible, clypeus except small median spot, lower inner eye orbit, oblique spot above antenna, occasionally a narrow line below ocellus, paired spots behind ocelli sometimes present, stripe on temple occasionally extending onto occiput, band on pronotum interrupted in middle, spot on tegula, band on postscutellum sometimes divided in middle or lacking, small spot above anteriorly on mesopleuron, outer surface of fore tibia and tarsus and mid tibia, a pair of oval spots on first abdominal tergum, narrow apical bands on second through fourth terga narrowly interrupted in middle, and transverse posterolateral marks on second, third, and occasionally fourth sterna.

MALE.—Length 8.5–11.0 mm. Coloration

much as in female, but occasionally the pale markings more extensive, including a pair of spots on scutellum, a spot on outer surface of hind tibia, small spot on each side of propodeum posteriorly, and tiny paired spots on middle of first abdominal tergum.

SPECIMENS EXAMINED.—NORTHERN PROVINCE. *Mannar District*: 1♀, Kondachchi, Ma Villu, 11–12 Apr, Krombein et al. (USNM).

CENTRAL PROVINCE. *Kandy District*: 112♀, Kandy (principally Udawattakele Sanctuary), 1700–2100 ft, 8–11 and 9–13 Feb, 26–30 Mar, 25–27 Apr, 8–11 and 29–30 May, 3–5 Jun, 5–15 and 20–30 Jul, 2–13 and 16–31 Aug, 1–3 and 27 Sep, 1–3 Oct, Clarke et al., Karunaratne et al., Krombein et al., Wickwar (USNM, Colombo). 1♀, Kandy, Peak View Motel, 1800 ft, 15–24 Jan, Davis et al. 1♂, Teldeniya, Bambaragala Rock, 10 May, Karunaratne et al. (USNM).

SABARAGAMUWA PROVINCE. *Ratnapura District*: 1♀, Rajawaka, 20 Jun, Krombein et al. (USNM).

Subfamily CERCERINAE

2. *Cerceris protea* Turner

FIGURES 9, 10, 38, 63, 83

Cerceris protea Turner, 1912:803, 804 [♀, ♂ from Deesa and Abu; ♀ lectotype in London].—Bohart and Menke, 1976: 585.

Cerceris protea is unique among the Ceylonese *Cerceris* in having the lower margin of the upper part of the mesopleuron margined by a strong carina. This unusual feature is found also in the closely related *C. turkestanica* Radoskowski from Central Asia. *Cerceris protea* differs from that species in having the basal platform on the second abdominal sternum broader, longer, and virtually impunctate, the median area behind the platform with very scattered punctures, female propodeum with a pair of large yellow spots instead of being immaculate or with tiny spots only, fourth abdominal tergum with large lateral spots instead of being entirely dark or with a narrow apical

fascia, and upper part of female clypeus weakly convex instead of rather strongly swollen.

The syntype series of *C. protea* in the British Museum consists of five females and eight males bearing typed labels "Deesa" with various dates from 1898 to 1901 and eight females and five males bearing typed labels "Abu"; each of these specimens also bears a label indicating it came from the Nurse collection. Two males from "Deesa" in the British Museum are excluded from the syntype series because each bears an additional label, "P. Cameron Coll./1914-110"; presumably they were not seen by Turner before that date. One female and one male labeled "Abu" and a female labeled "Deesa" (USNM) in a tray labeled "*protia* (!) Turn.," and one female and two males in American Museum of Natural History (AMNH) labeled "Abu" and identified as *Cerceris protea* Turner are also to be considered syntypes. (In 1921 Nurse sold identified Indian aculeate Hymenoptera to USNM and AMNH, including "co-types of spp. now in B.M.;" the lot contained six specimens of *C. protea* Turner). I have labeled as lectotype a female in the British Museum labeled "Deesa/10.98" and bearing Turner's label "*Cerceris/protea/Type* Turn."

In Sri Lanka *C. protea* occurs only in or near coastal areas of low altitude in the more xeric parts of the Dry Zone.

FEMALE.—Length 9.3–11.5 mm. Black, profusely marked with bright yellow as follows: large spot on temple, large narrowly separated spots on pronotal disk, tegula, bands on scutellum and postcutellum, mesopleuron except scrobal sulcus and posterior third of lower plate, a pair of very large spots on most of lateral and posterior propodeal surfaces, mesosternum, metasternum, all of legs except small blotch at apex of hind femur and tibia, basal half of second tergum, all of third except semicircular spot in middle at base, all of fourth and fifth terga except a broader, longer basal area, second sternum except basal platform and posterior half of third through fifth sterna; basal half of mandible, clypeus, front to above level of antennal fossae, supraclypeal area, narrow streak on interantennal crest, and scape be-

neath, creamy. The following light reddish: flagellum beneath, first abdominal segment, basal platform on second sternum and basal half of third to fifth sterna. Apex of forewing infumated beyond marginal cell, stigma and veins light brown.

Head (Figures 9, 10) width 1.7 times distance from apex of clypeus to anterior ocellus and 1.9 times least interocular distance; clypeus flat, without process, margin of median lobe truncate; supraclypeal area not strongly protuberant.

Upper part of mesopleuron with a strong ridge on lower margin adjacent to scrobal sulcus; propodeal enclosure glossy, with fine punctures, posterior third with a few transverse rugulae, median groove well developed, it and lateral grooves crossed by short ridges; lower inner margin of hind coxa with a sharp carina.

First segment 0.9 times as long as greatest width; none of terga with medioapical fovea; pygidium (Figure 38); base of second sternum with a semicircular platform abruptly declivous laterally and posteriorly; fifth sternum not dentate posterolaterally.

MALE.—Length 6.8–8.3 mm. Color pattern as in female except mesosternum usually dark in part or entirely, fourth tergum with fascia broadly interrupted in middle, sixth tergum with a broad apical fascia, fifth and sometimes fourth sterna with spots rather than a fascia, and ferruginous lacking on third through sixth sterna.

Head (Figure 63) width 1.5 times distance from apex of clypeus to anterior ocellus and 1.9 times least interocular distance; clypeus with margin of median lobe subtruncate, fimbria extending over more than half the lateral lobe.

Upper part of mesopleuron ridged as in female; propodeal enclosure as in female but median groove weaker.

First abdominal segment 0.9 times as long as greatest width; pygidium (Figure 83); second sternum with well-developed platform as in female; sixth sternum not dentate posterolaterally.

SPECIMENS EXAMINED.—NORTHERN PROVINCE. *Jaffna District*: 1♀, Elephant Pass, 29 Jan, Henry (Colombo); 1♀, Kilinochchi, 80 ft, 24–27 Jan,

Krombein et al. (USNM). *Vavuniya District*: 1♀, Parayanalankulum irrigation canal, 25 mi NW Medawachchiya, 100 ft, 20–25 Mar, Davis et al. (USNM). *Mannar District*: 5♀, 5♂, Cashew Corp., Ma Villu, 23 Jan, 17–21 Feb, 11–12 Apr, Karunaratne et al., Krombein et al. (USNM); 1♀, 5♂, 0.5 mi NE Kokmotte, Wilpattu Nat'l. Park, 50–100 ft, 22–23 Jan, 15–16 Feb, Krombein et al. (USNM); 3♂, Mannar, 31 Jan, Keiser (Basel).

EASTERN PROVINCE. *Trincomalee District*: 1♀, Paraiyalankulam, 15 May, Krombein et al. (USNM).

NORTH WESTERN PROVINCE. *Puttalam District*: 3♀, Puttalam, 21 Feb, Keiser (Basel).

SOUTHERN PROVINCE. *Hambantota District*: 1♂, Palatupana, 3–6 Feb, Krombein et al. (USNM). *District unknown*: 1♂, Talgasmankada, 11–14 Feb, Henry (Colombo).

3. *Cerceris intrusa*, new species

FIGURES 3, 4, 35, 55, 75

This distinctive species occurs in both Sri Lanka and South India. The pale markings of the Ceylonese population vary from ivory to light yellow and are somewhat more reduced, whereas the Indian population has brighter yellow and slightly more extensive maculations. The differences are too slight to warrant according subspecific rank to the two populations.

The female is distinguished immediately from females of all other Ceylonese species by the broadly rounded apical margin of the clypeal lobe and the deep, broad transverse impression above this lobe (Figures 3, 4). The male is distinguished from those of the other Ceylonese taxa by a combination of carinate lower inner margin of the hind coxa, lack of a posterolateral tooth on sixth sternum, the glossy propodeal enclosure, black clypeus and first tergum, and pale maculations on at least third and fifth terga, and frequently also on second and sixth terga, and a lateral clypeal fimbria one-third as wide as apical margin.

The specific name is from the Latin *intrudo* (thrust in) in allusion to the impressed transverse groove on the female clypeus.

HOLOTYPE.—♀; Sri Lanka, Eastern Province, Amparai District, Ekgal Aru Reservoir Jungle, 100 m, 19–22 Feb 1972, K. V. Krombein, P. B. Karunaratne, P. Fernando, D. W. Balasooriya (USNM Type 77469).

FEMALE.—Length 9.2 mm. Black, the following pale yellow: basal half of mandible, clypeus above impression, front to slightly above antennal fossae, scape and flagellum beneath, dot on tegula, mid and hind coxae and trochanters beneath, streak on inner surface of fore and mid femora, and outer surface of fore and mid tibiae. The following ivory: pair of anterior rounded spots on second tergum, narrow apical fascia on third tergum, small posterolateral spots on apex of fourth tergum, narrow apical fascia on fifth tergum slightly interrupted on midline, small lateral spot on second sternum, and larger lateral spots on third and fourth sterna. Forewing with narrow infuscation extending through marginal cell to apex, membrane otherwise slightly stained; stigma black, veins dark brown.

Head (Figures 3, 4) width 1.9 times distance from apex of clypeus to anterior ocellus and 2.1 times least interocular distance; clypeus without discal process but with a deep transverse groove above median lobe, the apical margin of which is broadly rounded; supraclypeal area not strongly raised and protruding beyond interantennal crest.

Propodeal enclosure glossy, with scattered minute punctures and deep median groove; hind coxa carinate beneath along inner margin.

First abdominal segment 0.9 times as long as wide; none of terga with small medioapical fovea; pygidium (Figure 35); second sternum with raised semicircular basal platform with abruptly declivous margin.

ALLOTYPE.—♂; same locality as holotype, but 9–11 Mar 1979, K. V. Krombein, T. Wijesinhe, S. Siriwardane, L. Jayawickrema (UNSM).

MALE.—Length 7.7 mm. Black, the following light yellow: spot at base of mandible, spot on supraclypeal area, side of front to just above antennal fossa, spot beneath on scape, basal segments of flagellum beneath, small spot on tegula, apex of hind coxa, outer surface of foretibia, inner

surface of mid tibia, and fore and mid basitarsi. The following ivory: narrow apical fascia on third tergum slightly widened toward side, narrower apical fascia on fifth tergum slightly interrupted in middle, and small lateral spot on third sternum. Wing as in female.

Head (Figure 55) width 1.5 times distance from apex of clypeus to anterior ocellus and 2.1 times least interocular distance; apical margin of clypeal lobe subtruncate, lateral fimbria of waxed hairs one-third width of clypeus.

Propodeal enclosure glossy, surface with scattered tiny punctures and a deep median groove; hind coxa with a sharp carina on inner ventral angle.

First abdominal segment 1.1 times as long as wide; sixth tergum without a blunt tubercle; pygidium (Figure 75); second sternum with a raised basal semicircular platform, which is abruptly declivous at margin; sixth sternum without posterolateral tooth.

PARATYPES.—15♀, 17♂ as follows. NORTH CENTRAL PROVINCE. *Anuradhapura District*: 2♀, Mihintale, G. M. Henry, 7–9 Jul 1927 (Colombo). EASTERN PROVINCE. *Amparai District*: 2♀, Lahugala, 15 Jun 1976, K. V. Krombein, and P. B. Karunaratne (USNM). CENTRAL PROVINCE. *Matale District*: 1♀, Dambulla, 6 Feb 1954, F. Keiser (Basel); 1♀, Sigiriya, 17 Jun 1975, D. H. Messersmith, G. L. Williams, P. B. Karunaratne (USNM); 1♀, Kibissa Jungle, 0.5 mi W Sigiriya, 1–3 Mar 1979, K. V. Krombein, T. Wijesinhe, S. Siriwardane, L. Jayawickrema, T. Gunawardane (USNM). NORTH WESTERN PROVINCE. *Puttalam District*: 1♂, 17 mi SE Puttalam, 18 Jun 1975, S. L. Wood and J. L. Petty (USNM). WESTERN PROVINCE. *Colombo District*: 1♀, 1♂, Colombo Museum Garden, 28–31 Jan 1975, K. V. Krombein, P. B. Karunaratne, P. Fernando (USNM). *Kalutara District*: 1♀, Labugama, 15–18 Aug 1932, G. M. Henry (Colombo). SABARAGAMUWA PROVINCE. *Kegalla District*: 1♀, Kitulgala, Bandarakele Jungle, 17–18 Mar 1979, K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, T. Gunawardane (USNM). *Ratnapura District*: 1♂, Gilimale, Induruwa Jungle, 10 Oct 1980, K. V. Krombein, P. B. Karunaratne, T.

Wijesinhe, L. Jayawickrema, V. Gunawardane (USNM). UVA PROVINCE. *Monaragala District*: 1♀, 1♂, Angunakolapeessa, 17–19 Jun 1978, K. V. Krombein, T. Wijesinhe, V. Kulasekare, L. Jayawickrema (USNM); 1♀, Mau Aru, 10 mi E Uda Walawe, 100 m, 24–26 Sep 1977, K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, M. Jayaweera (USNM). SOUTH INDIA. 3♂, Anamalai Hills, 3100 ft, May 1951, P. S. Nathan (USNM); 2♂, Ammatti, S. Coorg, 3100 ft, Feb and Nov 1952, P. S. Nathan (Corvallis); 1♂, Nilgiri Hills, Cherangode, 3400 ft, Nov 1950, P. S. Nathan (USNM); 1♂, Nilgiri Hills, Devala, 3200 ft, Oct 1960, P. S. Nathan (Leiden); 1♂, Coimbatore, 24 Dec 1951, P. S. Nathan (Corvallis). Paratypes in Colombo, London, Corvallis, Leiden, Basel, and the W. J. Pulawski collection.

Female paratypes are 8.7–10.0 mm long, and male paratypes 6.6–9.0 mm. Three Ceylonese females lack pale maculations on fourth and fifth terga, three others have small paired light yellow spots on postscutellum, and three have light yellow abdominal maculations rather than ivory. Indian females have brighter yellow maculations, the postscutellum is banded, and second tergum sometimes has a narrow apical fascia. One Ceylonese male has tiny paired spots on postscutellum, and another has paired spots at base of second tergum and paired lateral spots on second and fourth sterna. Most Indian males have brighter yellow maculations, except two that have ivory spots on the abdomen; most specimens have a median spot on clypeus, band on postscutellum, basal spots and a median apical spot on second tergum, and an apical fascia or paired spots on sixth tergum; and four males have tiny paired spots on pronotum.

4. *Cerceris pictiventris novarae* Saussure

FIGURES 7, 8, 37, 62, 82

Cerceris novarae Saussure, 1867:92, fig. 54 [♀; Ceylon; type in Vienna].—Schletterer, 1887:498.—Cameron, 1890:249, 257, 258, pl. 10: fig. 8a, b [Ceylon, Bombay, Barrackpore, Poona].—Bingham, 1896:445.—Dalla Torre, 1897:469.—Turner, 1912:804, 805, figs. 66, 90 [India, Burma, Ceylon].

- Cerceris fervens* Smith, 1873:411 [♀, ♂; India; type in London].—Magretti, 1886:598 [♀; Sauakin].—Schletterer, 1887:491.—Cameron, 1890:256 [suggests that this is identical with *C. novarae*].—Dalla Torre, 1897:460.
- Cerceris pictiventris* Dahlbom.—Bingham [in part], 1897:305, 306 [India, Ceylon, Burma, Tenasserim; incorrectly synonymizes *C. novarae* and *C. fervens* under *C. pictiventris*].
- Cerceris pictiventris novarae* Saussure.—Vecht, 1964:354 [places *C. novarae* as a subspecies of *C. pictiventris*].—Bohart and Menke, 1976:585.

The female of *C. pictiventris novarae* is distinguished from females of other Ceylonese species by the strongly protuberant supraclypeal area (Figure 8), which in profile extends slightly beyond the interantennal prominence. The male is distinguished by a combination of the raised basal platform on second abdominal sternum with abruptly declivous lateral and posterior margins, the presence of pale fascia on second, third, fifth, and sixth terga, subtruncate apical margin of median clypeal lobe, and absence of a carina on lower edge of upper mesopleural plate.

The taxon occurs in both the Wet Zone and the Dry Zone in Sri Lanka at altitudes up to 2200 ft and in areas with annual rainfall ranging from 25" to over 200". It occurs also in India, and other subspecies range throughout Southeast Asia eastward to New Guinea and the Solomon Islands and northward to China and Taiwan.

Cerceris pictiventris novarae nests in level ground and has been taken once with its nominate bee prey, *Nomia* (*Austronomia*) *krombeini* Hirashima.

FEMALE.—Length 7.4–9.0 mm. Black, the following bright yellow: basal half of mandible, clypeus except narrow apex of median lobe, supraclypeal area, narrow streak on interantennal prominence, side of front to above antennal fossa, antenna beneath, small spot above and behind eye, large oval spot laterally on pronotal disk, tegula except inner margin, narrowly separated spots or band on scutellum, band on postscutellum, anterior spot on lower mesopleural plate, large posterolateral spot on propodeum, paired spots at apex of mesosternum, coxae beneath, trochanters, fore and mid femora, hind femur except dark streak on inner surface except at base, tibiae except hind tibiae on apical half of inner

surface, fore and mid tarsi, basal third or half of second abdominal tergum, third and fifth terga with apical fascia laterally on entire segment and narrowing gradually to middle where they are a third the length, a pair of large spots or transverse band on second sternum, broad fascia on third and fourth sterna, and transverse band or large spots on fifth; hind tarsal segments brownish at apex above on basal joints, and entirely so on apical segments. Apex of forewing with a diffuse infumation beyond marginal cell, stigma and veins dark brown.

Head (Figures 7, 8) width 1.6 times distance from clypeal apex to anterior ocellus, and 2.0 times least interocular distance; median lobe of clypeus slightly concave above the truncate apex, process lacking; supraclypeal area strongly protuberant, in profile extending slightly beyond interantennal crest.

Propodeal enclosure glossy, finely punctate, median and lateral grooves well developed with small crenulations.

First abdominal segment as long as greatest width; none of terga with small medioapical fovea; pygidium (Figure 37); second sternum with raised semicircular platform, which is abruptly declivous laterally and posteriorly; fifth sternum without posterolateral tooth.

MALE.—Length 5.6–8.0 mm. Color pattern as in female except maculations on temple, scutellum, mesopleuron and mesosternum usually lacking, fore and mid femora black at base, hind femur entirely black, apical third or half of hind tibia black, propodeal spots smaller, markings on abdomen usually smaller or narrower, sixth tergum with apical fascia, and second to fourth sterna with fascia or narrowly separated spots. Wing as in female.

Head (Figure 62) width 1.6 times distance from clypeal apex to anterior ocellus and 2.0 times least interocular distance; apical margin of median lobe of clypeus subtruncate, lateral fimbria of waxy hairs more than half as wide as lateral lobe; supraclypeal area protuberant, but not so strongly as in female.

Propodeal enclosure glossy, with minute punc-

tures, median groove well developed but crenulations evanescent; hind coxa with a sharp carina on inner margin of ventral surface.

First abdominal segment 1.1 times longer than greatest width; sixth tergum without posterolateral tubercle; pygidium (Figure 82); second sternum with raised semicircular platform, which is abruptly declivous laterally and posteriorly; sixth sternum without a posterolateral tooth.

SPECIMENS EXAMINED.—NORTHERN PROVINCE. *Jaffna District*: 1♂, Karaitivu, 8 Feb, Karunaratne (Colombo). *Mannar District*: 1♂, Parayanalankulam, 10 Apr, Krombein et al. (USNM).

NORTH CENTRAL PROVINCE. *Anuradhapura District*: 4♀, 4♂, Padaviya archaeological site, (1♀ in Malaise trap), 60 m, 20–23 Feb, 20 May, 11–14 Oct, Krombein et al. (USNM); 1♀, 1♂, Padaviya tank, 60 m, 20–21 May, Krombein et al. (USNM).

EASTERN PROVINCE. *Trincomalee District*: 4♂, China Bay Ridge Bungalow, 25–50 ft, 26 Feb, 12–15 May, Krombein et al. (USNM); 1♂, China Bay, near Ridge Bungalow, 0–30 m, 8–11 Oct, Krombein et al. (USNM). *Amparai District*: 1♀, Ekgal Aru Sanctuary Jungle, in Malaise trap, 9–11 Mar, Krombein et al. (USNM); Maha Oya Tank, 70 m, 15 Sep, Krombein et al. (USNM).

CENTRAL PROVINCE. *Nuwara Eliya District*: 1♀, 2♂, Pundaluoya, Feb, Dec (Colombo, London). *Kandy District*: 4♀, 8♂, Kandy (includes Udawattakele Sanctuary, 2100 ft), 16–31 Aug, 1–17 and 20–27 Sep, 1–3 Oct, Karunaratne, Krombein et al. (USNM); 1♂, Hasalaka, 107 m, 16–19 Feb, Krombein et al. (USNM); 1♀, 2♂, Hantana, 25 Jul, Keiser (Basel); 3♂, Peradeniya Botanical Gardens, 27 Jan, 21 May, Keiser, Halstead (Basel, San Francisco).

NORTH WESTERN PROVINCE. *Puttalam District*: 5♀, Deduruoya, 5 Mar, Perera (Lawrence).

WESTERN PROVINCE. *Colombo District*: 5♀, 11♂, Colombo (includes Museum Garden), 15 and 28–31 Jan, 8–14 Feb, 28 Mar, Apr, 14, 16, and 28 Jun, Jul, Sep, Henry, Karunaratne, Krombein et al., Nietner, Wijesinhe, (USNM, Colombo, Berlin); 1♀, Kurana, Katunayake, 16 Jan, Krombein, 11677 B (USNM); 8♂, Labugama, 16 Feb, 9 May, 11 Jul, Krombein et al. (USNM); 1♂, Pamunu-

gama, 16 Jan, Krombein et al. (USNM); 1♂, Gampaha Botanic Garden, 28 Jan, 27 Sep, Krombein et al. (USNM); 1♀, 1♂, Ratmalana, near airport, 19–21 Jan, 6 Jun, Krombein et al. (USNM); 4♂, Laxapathiya, 15 mi S Colombo, 15–30 Jan, Perera (Lawrence); 1♂, Udugalla, 12 mi from Colombo, 15 Feb, Perera (Lawrence).

SABARAGAMUWA PROVINCE. *Ratnapura District*: 3♀, 8♂, Gilimale, Induruwa Jungle (2♀ in Malaise trap), 2 and 5–7 Feb, 7–8 Mar, 19–22 Jun, 10 Oct, Krombein et al. (USNM); 1♀, 1♂, Eratne, Adams Peak Trail, 1 and 6 Feb, Krombein et al. (USNM); 1♂, Ratnapura, 18 Oct, Krombein et al. (USNM); 1♂, Hatherleigh, 1 mi S Rakwana, 28 Feb, Brinck et al. (Lund); 2♀, 2♂, Watawella, Jan, Feb (Colombo).

UVA PROVINCE. *Badulla District*: 1♀, Ella, 26 Nov, Hevel et al. (USNM); 1♀, Badulla, 7 Dec (London); 1♂, Haldamulla, Jul (Colombo); 1♂, Madulsima, 27 Sep (London); 1♂, Welimada, Uva Ben Head, 23 Sep, Keiser (Basel). *Monaragala District*: 2♀, 1♂, Uda Walawe, 10–13 mi E, on sand along Mau Aru, 22 Jan, 16 Jun, Krombein et al. (USNM); 4♀, Angunakolapelessa, 100 m, 21–23 Jan, 17–19 Jun, Krombein et al. (USNM).

SOUTHERN PROVINCE. *Galle District*: 3♂, Hini-duma, 20–28 Feb, Perera (Lawrence); 3♀, 3♂, Kanneliya, Sinharaja Jungle, 24–26 Jan, 2–5 Oct, Krombein et al., several in Malaise trap (USNM). *Matara District*: 1♂, Deniyaya, 19 Sep, Henry (Colombo). *Hambantota District*: 1♂, Palatupana, 3 Feb, Krombein et al. (USNM).

MISCELLANEOUS. 1♀, Puttalam Dist., Tabbowa-Anuradhapura Dist., Galkulama, 18 Oct, Robinson et al. (USNM); 1♀, Ceylon, Nietner (Berlin).

5. *Cerceris wickwari* Turner

FIGURES 5, 6, 36, 58, 68, 78

Cerceris wickwari Turner, 1912:799, 800 [♀, ♂; Colombo, Ceylon; ♀ lectotype in London].—Bohart and Menke, 1976:589.

This species is a member of the *rybyensis* group, but the female has a character somewhat reminiscent of the *bupresticida* group. This is a broad,

shallow fovea at the base of fifth abdominal sternum margined posteriorly by a row of four tubercles of which the lateral pair is weak. Females identified as *C. albopicta* Smith by Cameron from Quetta have this peculiar development on both the fourth and fifth sterna.

Turner described both sexes from "Ceylon, Colombo, Wickwar, July to September, March to April." The syntype series in the British Museum consists of one female bearing labels "Colombo, 8/9.01, Ceylon" and a Turner label "Cerceris/wickwari/Type Turn.," and two males, "Colombo/4.02 Ceylon" and "Colombo/02 Ceylon"; the former male also bears a Turner label, "Cerceris/wickwari/♂ Turn." Two females and two males in the Colombo Museum were collected in Colombo by Wickwar in Feb, Mar, Jul, and Sep; they were identified by Turner and are presumed to be syntypes also except for the specimen collected in Feb. I have selected as lectotype the female in the British Museum labeled "Type" by Turner.

Cerceris wickwari and *C. v. vischnu* Cameron share the distinction of being the most melanistic of the Ceylonese taxa of *Cerceris*. Pale fasciae on the abdominal terga occur on only the third and fifth in the females and are limited to the third, fifth (*C. wickwari* only), and sixth in the males. The two taxa are easily separated on other color characters, *C. wickwari* lacking red on bases of legs but having the first and base of second abdominal segments red, and in having pale spots on pronotum, tegula, and postcutellum, whereas in *C. v. vischnu* the bases of the legs are red, but only the first abdominal sternum is red, and the thorax is black except for a tiny spot on tegula. In addition, the female of *C. wickwari* lacks a clypeal process, whereas *C. v. vischnu* has a small process above the apical margin of the median lobe.

C. wickwari occurs only in Sri Lanka in both the Wet Zone and the Dry Zone and at very low altitudes.

FEMALE.—Length 8.1–10.3 mm. Black, the following ivory: mandible except apical fourth, clypeus, supraclypeal area and short streak on interantennal prominence, front to level of antennal

fossae, small spot behind upper eye occasionally lacking, scape beneath, paired spots on pronotal disk, tegula except small spot in middle on inner edge, tiny lateral spots on scutellum and postscutellum present or not, a pair of posterior spots on mesosternum present or not, metasternum, coxae beneath in part or entirely, trochanters beneath, forefemur beneath wholly or in part, streak above on mid and hind femora present or not, fore and mid tibiae externally entirely or in part, hind tibia with streaks or spots or not, fore and mid tarsi, hind tarsus beneath on basal segments, apical fascia on third and fifth abdominal terga, broad fascia on third sternum, and lateral spot on fifth sternum; first abdominal segment, basal half or less of second tergum and second sternum, ferruginous; flagellum testaceous beneath. Forewing with a weak infumation on anterior edge of marginal cell extending to apex, stigma and veins dark brown.

Head (Figures 5, 6) width twice the distance from apex of clypeus to anterior ocellus and 2.3 times least interocular distance; median lobe of clypeus shallowly concave, its apical margin slightly and broadly emarginate, process lacking; supraclypeal area not strongly protuberant and in profile not extending beyond interantennal prominence.

Propodeal enclosure glossy, most of surface with minute punctures but with a few short oblique rugulae anterolaterally, median groove strong, weakly crenulate; inner ventral margin of hind coxa strongly carinate.

First abdominal segment with length subequal to greatest width; none of terga with medioapical fovea; pygidium (Figure 36); second sternum with a weakly raised, semicircular platform at base, the margins sloping gradually to rest of sclerite; fifth sternum with basal half depressed across middle, the depression margined posteriorly by four tubercles, the inner pair stronger, posterolateral tooth absent.

MALE.—Length 6.9–8.9 mm. Color pattern as in female except spot absent behind eye, scutellum sometimes dark, postscutellum banded or immaculate, sixth abdominal tergum with a nar-

row apical fascia. Wing as in female except no infumation in marginal cell.

Head (Figure 58) width 1.6 times distance from clypeal apex to anterior ocellus and twice the least interocular distance; clypeus (Figure 68) with lateral fimbria of curled hairs on lateral fifth, apical margin of median lobe truncate; mandible with a large subbasal tooth on inner margin.

Propodeal enclosure as in female, the anterolateral rugulae weaker, and crenulations of median groove evanescent.

First abdominal segment with length subequal to greatest width; pygidium (Figure 78); second sternum with a weakly raised basal platform, the margins not abruptly declivous; sixth sternum without posterolateral tooth.

SPECIMENS EXAMINED.—NORTHERN PROVINCE. *Mannar District*: 2♀, 1♂, Kokmotte Bungalow, 0.5 mi NE Wilpattu N.P., 21–25 May, Krombein et al. (USNM); 1♀, same locality, 50–100 ft, 22–23 Jan, Krombein et al. (USNM); 1♂, Marichchukadi, 26 Jan, Karunaratne et al. (USNM).

WESTERN PROVINCE. *Colombo District*: 2♀, 2♂, Colombo, Feb, Mar, Jul, Sep, Wickwar (Colombo); 4♀, 2♂, Ratmalana (includes near airport), 50 ft, 15 Feb, 6 Jun, 29 Sep, Karunaratne, Krombein et al. (USNM).

SOUTHERN PROVINCE. *Hambantota District*: 1♀, 1♂, Yala, Palatupana, 8–10 Mar, Krombein et al. (USNM).

6. *Cerceris bidentula spiniventris* Tsuneki, new status

FIGURES 13–15, 40, 52, 70, 71, 89

Cerceris spiniventris Tsuneki, 1963:34, 35, fig. 71 [♂; Chiang-mai, Thailand; holotype in Kobe].—Bohart and Menke, 1976:587.

I have studied the female holotypes of *C. bidentula* Maidl from Celebes (Vienna) and *C. langkasukae* Pagden from Malaya (London) and have compared a female paratype of the latter directly with the unique type of the former. Unquestionably they are synonymous (new synonymy). This

taxon, however, represents the typical subspecies of a polytypic species, and the population occurring in Sri Lanka, South India, and Thailand represents a discrete subspecies, *C. bidentula spiniventris* Tsuneki. I have examined Tsuneki's holotype and find that it agrees in structural details with Ceylonese males, and that the color pattern is exactly as in some of those males. The typical subspecies certainly must occur on some of the islands between Celebes and Malaysia, but it was not treated as part of the Javan fauna by van der Vecht (1964). The two subspecies are separated by color, typical *C. bidentula* having yellow rather than ivory markings.

Males of *C. b. spiniventris* and *C. mastogaster* Smith are the only Ceylonese taxa with an acute posterolateral tooth on the sixth abdominal sternum. The female of *C. b. spiniventris* is distinguished readily by the presence of two small, subcontiguous teeth on the median lobe of the clypeus just above the apical margin (Figures 13–15), by the buprestid clamp on the fifth abdominal sternum (Figure 89), which consists of a shallow median pit near the apical margin margined posteriorly by a low, erect transverse lamella, and by a posterolateral acute tooth on the fifth sternum. The female of *C. mastogaster* also has the clypeal teeth, but the buprestid clamp consists of erect lateral processes on the third to fifth sternum, a broadly concave median area on fifth sternum margined posteriorly in middle by an erect, acutely angled process. Both sexes of the two taxa are readily separated because *C. mastogaster* is larger, has an infuscated spot near the apex of the forewing, the ivory outer surface of all tibiae, and the basal fascia on the second abdominal tergum.

The Padaviya male is a teratological specimen. The vertex behind the right posterior ocellus is deeply indented. The abdomen is broader and shorter than in normal specimens, the first segment being 0.9 times as long as greatest width rather than 1.7 times as long as broad. The second sternum bears a pair of subbasal tubercles opposite the anterolateral angles of the first sternum.

Otherwise it agrees in color pattern and structural details with normal specimens.

The Palaearctic *C. odontophora* Schletterer is very closely related to *C. bidentula*. However, in both sexes the propodeal enclosure is glossy with scattered tiny punctures in the former species and finely roughened in the latter, and the basal raised area on the second abdominal sternum is lacking in the former and weakly developed in the latter. The posterolateral tooth on the fifth abdominal sternum of the female is weak and blunt in the former species, acute and well developed in the latter. The male of *C. bidentula* has a small posterolateral tooth on the sixth abdominal tergum, which is lacking in *C. odontophora*, and the posterolateral tooth on the sixth sternum is stronger.

Cerceris b. spiniventris is widely distributed in both the Wet Zone and the Dry Zone in areas of very heavy to slight rainfall and at rather low altitudes. It occurs also in South India at elevations of 700–1800 ft and in Thailand. It preys upon small, slender buprestid beetles and in Sri Lanka prefers to nest in soil with a moderate to high gravel content.

FEMALE.—Length 7.0–7.9 mm. Black, the following ivory: base of mandible, upper half or two-thirds of median clypeal lobe, narrow streak present or not on supra-clypeal area and interantennal crest, side of front to level of antennal fossa, scape at apex beneath, small lateral spot on pronotal disk, usually a spot on tegula, band or paired spots or none on postscutellum, outer surface of fore and mid tibiae, occasional streak on hind tibia, tarsi except last segment of hind, pair of small spots or none on base of second abdominal tergum, apical fascia on third and fifth terga, and band on third sternum; sides or all of first segment ferruginous, and base of second sternum occasionally. Forewing with a very faint small infumation beyond marginal cell, stigma and veins dark brown.

Head (Figures 13–15) width 1.5 times distance from clypeal apex to anterior ocellus and 1.8 times least interocular distance; clypeus with a pair of small teeth above apical margin, median

lobe with margin sinuate and with a blunt lateral tooth.

Propodeal enclosure finely roughened, median groove lacking; hind coxa carinate along inner ventral margin.

First abdominal segment subequal to greatest width; none of terga with medioapical fovea; pygidium (Figure 40); basal platform on second sternum slightly developed; fifth sternum (Figure 89) with an acute posterolateral tooth and a buprestid clamp consisting of a large medioapical fovea margined posteriorly by a suberect flange.

MALE.—Length 5.3–7.0 mm. Color pattern as in female except clypeus may be pale except narrow apical rim, basal half of hind tibia pale, fascia on third tergum may be broadly interrupted in middle, fifth tergum is black, but sixth has a broad fascia, and band on third sternum may be broadly interrupted in middle.

Head (Figure 52) width 1.5 times distance from clypeal apex to anterior ocellus and 2.0 times least interocular distance; margin of clypeal lobe subtruncate, clypeal fimbria only about one-fifth clypeal width.

Propodeal enclosure finely roughened, median groove lacking; hind coxa carinate along inner ventral angle.

First abdominal segment 1.7 times as long as greatest width; sixth tergum with small posterolateral tooth or tubercle, which is lacking in smallest specimens; pygidium (Figure 70); platform on second sternum undeveloped; sixth sternum (Figure 71) with an acute posterolateral tooth.

SPECIMENS EXAMINED.—NORTHERN PROVINCE. *Mannar District*: 1♂, Mannar, 29 Jan, Keiser (Basel); 1♂, 0.5 mi NE Kokmotte, Wilpattu Natl. Park, 15–16 Feb, Krombein et al. (USNM); 1♀, Ma Villu, 16–19 Sep, Krombein et al. (USNM).

NORTH CENTRAL PROVINCE. *Anuradhapura District*: 13♀, 1♂, Padaviya (includes Irrigation Bungalow, archaeological site), 180 ft, 12–22 Mar, 18–20 May, 11–14 Oct, 3♀ in Malaise trap, Karunaratne et al., Krombein et al. (USNM); 4♀, 17♂, Hunuwilagama (includes Wildlife Soc. Bungalow) 200 ft, 10–19 Mar, 22–26 May, Davis et al., Krombein et al. (USNM).

EASTERN PROVINCE. *Trincomalee District*: 5♀, 13♂, Trincomalee (includes China Bay, Ridge Bungalow), 0–100 ft, 27–31 Jan, 26 Feb, 13–17 May, 24–25 Jul, 8–11 Oct, Krombein et al. (USNM); 4♂, 7 mi W Trincomalee, 15 May, Krombein et al. (USNM). *Amparai District*: 1♀, Ekgal Aru Reservoir Jungle, 100 m, 19–22 Feb, Krombein et al. (USNM); 1♂, Lahugala, 15 Jun, Krombein et al. (USNM).

NORTH WESTERN PROVINCE. *Puttalam District*: 1♀, 2♂, 17 mi SE Puttalam, 18 Jun, Wood et al. (USNM).

WESTERN PROVINCE. *Colombo District*: 2♀, 1♂, Labugama Reservoir Jungle, 400 ft, 9 May, 11 Jul, Krombein et al. (USNM); 1♂, Gampaha Bot. Garden, 28 Jan, Krombein et al. (USNM).

SABARAGAMUWA PROVINCE. *Ratnapura District*: 1♀, 6♂, Gilimale, Induruwa Jungle, 2 and 5–7 Feb, 10 Oct, Krombein et al. (USNM); 1♂, Ratnapura, 20 Dec, Henry (Colombo).

UVA PROVINCE. *Monaragala District*: 2♀, Angunakolapelessa, 100 m, 21–23 Jan, Krombein et al. (USNM).

SOUTHERN PROVINCE. *Galle District*: 10♀, 1♂, Udugama, Kanneliya Jungle, 400 ft, 11–16 Jan, 6–12 Oct, Krombein et al. (USNM).

MISCELLANEOUS. 1♂, Sri Lanka, Tabbowa, Puttalam Dist.–Galkulama, Anuradhapura Dist., 18 Oct, Robinson et al. (USNM).

7. *Cerceris mastogaster* Smith

FIGURES 53, 72, 73

Cerceris mastogaster Smith, 1856:453 [♀; Madras, India; type in British Museum].—Schletterer, 1887:496 [listed].—Cameron, 1890:249 [listed].—Bingham, 1897:310 [re-described].—Dalla Torre, 1897:467 [listed].—Turner, 1912:505, 506, figs. 53, 77 [type redescription].—Bohart and Menke, 1976:583 [listed].

Cerceris abuensis Turner, 1912:807, 808 [in part] [♂ paralectotype, but not ♀ lectotype; Mount Abu, India; British Museum].

I have examined the unique female holotype of *C. mastogaster* and associate as the opposite sex all but one of the males included in the syntype series of *C. abuensis*. Both sexes have characters of

the *bupresticida* group, the female with a buprestid clamp, and the male with an acute posterolateral tooth on the sixth abdominal sternum. These characters distinguish *C. mastogaster* from all of the Ceylonese taxa except *C. bidentula spiniventris* Tsuneki. Both sexes of *C. mastogaster* are larger than the latter taxon, have the apex of the forewing strongly infuscated rather than weakly infuscated, the female has a pair of erect lateral processes on the third to fifth sterna rather than an acute posterolateral tooth on the fifth sternum, and the male has a blunt posterolateral tubercle on the sixth tergum, which is lacking in the other taxon.

The type of *C. mastogaster* has more extensive red markings on the abdomen than the other two females, the female from South India has the least red on the abdomen, and the Ceylonese female has some red on only the hind femur rather than on all femora. The Ceylonese female is smaller than the Indian females.

Turner based *C. abuensis* on a mixed series collected by C. G. Nurse. The syntypes consist of one female and ten males each bearing a typed label "Abu." The female and one male are the only specimens bearing handwritten labels by Turner, respectively, "Cerceris/abuensis/Type Turn." and "Cerceris/abuensis/Type ♂ Turn." (Turner usually did not label more than one pair.) The other nine males stand over a Turner identification label, "Cerceris abuensis Turn.," in the general collection. They are to be considered syntypes in accordance with the provisions of Article 73(c)(i) of the *International Code of Zoological Nomenclature*. The specimens labeled "types" agree with Turner's description of the two sexes, but they belong to different species; eight of the other nine males are conspecific with Turner's type male; and the ninth male is the opposite sex of his type female. There is another male bearing an "Abu" label and an identification label "Cerceris/albopicta/Sm." in Cameron's handwriting. It came to the British Museum from the Cameron collection in 1914, and presumably was not seen by Turner when he described *C. abuensis*; I do not consider it a syntype. There are in the National

Museum of Natural History (USNM) two males of *C. mastogaster* bearing typed locality labels "Abu" exactly as in the syntype series of *C. abuensis*. They were in a tray with several specimens of both sexes bearing typed "Quetta" locality labels and identified as *C. albopicta* Smith. These were purchased from Nurse with this identification, so they cannot be considered syntypes of *C. abuensis*.

The type female bears another label, "B.M. TYPE/HYM./21.1, 223." It was so labeled during World War II and placed in the segregated collection of holotypes. I have labeled it the lectotype of *C. abuensis*. This selection is in consonance with Turner's policy (1912:477) that he did not describe "species from the male sex [only], considering that as a rule it is inadvisable in this genus to make the male the type. . . ."

The true male of *C. abuensis* differs from Turner's type male in lacking the posterolateral tooth on both the sixth abdominal tergum and sternum, in having a broader fimbria of curled hairs on the clypeal margin extending to the clypeal lobe, and in having a very weak infuscation rather than a large infuscation at the apex of the forewing. The lectotype female of *C. abuensis* lacks a posterolateral tooth and a median buprestid clamp on the fifth abdominal sternum, and the apex of the forewing is only very weakly infuscated as in the male. The female of *C. mastogaster* has a buprestid clamp on the third to fifth sterna, and a large infuscation at the apex of the forewing.

Cerceris abuensis occurs in South India, but it has not yet been collected in Sri Lanka.

There are so few Ceylonese specimens that the descriptions below are based also on the type of *C. mastogaster*, another female from South India, and 18 males from South and Central India and Abu.

FEMALE.—Length 10.0–13.5 mm. Black, the following white or ivory: basal half of mandible, clypeus except narrow apical margin, streak on supra-clypeal area and interantennal crest, sides of face broadly to just above antennal insertions, scape beneath, broad spots on pronotal disk, most

of tegula, band on postscutellum, fore and mid femora beneath on apical half or more, small spot at apex of anterior surface of hind femur, outer surface of all tibiae, basitarsi, transverse fascia on base of second abdominal tergum, third tergum with large lateral spots narrowing toward midline, broad fascia on fifth tergum gradually narrowing toward midline, and lateral spot on third sternum; rest of tarsi testaceous or darker. The following red: flagellum beneath, propodeum except enclosure, mid and hind coxae and trochanters or only hind segments, all femora or only hind femur in part, first three terga except pale areas or only first tergum, sometimes basal half of second tergum behind pale fascia, first to fifth sterna except pale lateral spot on third or only first through third sterna, and median blotch on fourth sternum. Forewing pale and with a strong infuscation beyond marginal cell, stigma and veins dark brown.

Head width 1.4 times distance from clypeal apex to anterior ocellus and 1.9 times least interocular distance; clypeus with a pair of small close-set teeth above apical margin, median lobe slightly sinuate and with a blunt lateral tooth.

Propodeal enclosure glossy, impunctate, median groove very weak, extreme base with a few weak rugulae.

First abdominal segment about as long as greatest width; none of terga with medioapical fovea; pygidium elongate ovate, apex truncate, length 2.3 times greatest width, surface irregularly wrinkled; second sternum with a very weak basal platform; third to fifth sterna each with a large, erect sublateral process having a truncate or rounded apex; fifth sternum shallowly concave between lateral projections and posteriorly with a strong, erect triangular lamella.

MALE.—Length 7.9–10.7 mm. Black, the following white or ivory: basal half of mandible, clypeus except narrow anterior margin, narrow line on middle of face to interantennal crest, large lateral spot on lower half of front, scape beneath, large lateral spot on pronotal disk, tegula, band on postscutellum, basal spot on second abdominal tergum, broad apical band on third tergum nar-

rowed toward middle, sixth tergum except extreme base, bands on second and sixth terga may sometimes be narrower, occasional small basal spot on second sternum, band across middle of third sternum, small spots on hind coxa, large spot on apex of fore and mid femora, and almost all of tibiae and tarsi. The following light red: rest of hind coxa, basal half of hind femur, first abdominal segment and basal two-thirds of second sternum; flagellum testaceous beneath; wings almost clear, forewing with large infumation beyond marginal cell.

Head (Figure 53) width 2.0 times distance from apex of clypeus to anterior ocellus and 1.9 times least interocular distance; clypeus with apical margin of median lobe very weakly tridentate, fimbria of waxed hair on lateral fourth of margin.

Propodeal enclosure glossy, impunctate, basal half occasionally with traces of weak longitudinal ridges, posterior half with a weak median groove; hind coxa with a sharp carina along inner ventral margin.

First abdominal segment 1.2 times as long as wide; sixth tergum with a small, blunt posterolateral tubercle; pygidium (Figure 72); second sternum with a pair of extremely weak anterolateral tubercles, which are sometimes evanescent, basal platform slightly raised; sixth sternum with an acute posterolateral tooth (Figure 73).

SPECIMENS EXAMINED.—NORTHERN PROVINCE. *Mannar District*: 1♀, Kondachchi, Ma Villu, 11–12 Apr, Krombein et al. (USNM).

NORTH CENTRAL PROVINCE. *Anuradhapura District*: 1♂, Hunuwilagama, 22–26 May, Krombein et al. (USNM).

EASTERN PROVINCE. *Trincomalee District*: 2♂, Trincomalee, China Bay Ridge Bung., 0–100 ft, 13–17 May, Krombein et al. (USNM).

MISCELLANEOUS. 1♂, North Western Province, Puttalam District, Tabbowa-Anuradhapura District, Galkulama, 18 Oct, Robinson et al. (USNM).

8. *Cerceris dissecta* (Fabricius)

FIGURES 16, 17, 41, 54, 74

Philanthus dissectus Fabricius, 1798:269 [♀; India; type in Copenhagen]; 1804:306.—Thunberg, 1815:291.—Dalla Torre, 1897:485.—Turner, 1912:813.

Cerceris dissecta (Fabricius).—Cameron, 1890:249, 264.—Vecht, 1961:66 [redescription of type].—Bohart and Menke, 1976:580.

Cerceris tristis Cameron, 1890:250, 255, 256, pl. 10: fig. 7a,b [♀,♂; Barrackpore, Tirhoot; type series in Oxford].—Bingham, 1897:309.—Dalla Torre, 1897:479.—Turner, 1912:810, 811, figs. 60, 84 [Quetta, Deesa, Barrackpore, Ceylon].—Bohart and Menke, 1976:588. [New synonymy.]

The brief notes on the Fabrician type by van der Vecht (1961) left little doubt that *C. tristis* was a junior synonym of *C. dissecta*. This was confirmed by B. Petersen (in litt., 1979), who stated that a female of *C. tristis* that I sent to him agreed perfectly with the type.

Cameron described *C. tristis* from both sexes from Barrackpore and Tirhoot, all from the Rothney collection, and noted that it was common. The syntype series in Oxford consists of three females and two males, none bearing a locality label. One male bears a label in Cameron's hand, "*Cerceris/tristis/Sm.*"; the reverse of this label bears "*praedator Sm.*," presumably in Rothney's hand. One female bears a small square of paper with "7" in red ink; presumably this was the specimen from which figure 7a,b was made, which accompanied the original description. All specimens belong to *C. tristis*, the pale markings are white to ivory, and red is present only on the mid and hind trochanters, hind coxa, and sides of the first abdominal segment of the male bearing the identification label. I have selected as lectotype the female bearing the "7" label.

The female of *C. dissecta* is separated from those of other species having a low transverse clypeal lamella by the smooth, micropunctate propodeal enclosure and the pygidium (Figure 41) having the basal and subapical widths subequal; the other females have a roughened or rugulose propodeal enclosure, and the basal width of the pygidium greater than the apical. The male is separated from those of other species by a combination of the smooth, micropunctate propodeal enclosure, presence of a carina on inner margin of ventral surface of hind coxa, and the narrow clypeal fimbria (Figure 54), which is only one-fifth the clypeal width.

Turner (1912) noted that this seems to be one of the most common species in India. This is true also in Sri Lanka, although it occurs mainly in the Dry Zone at elevations up to 450 ft. Turner also noted that the form with red on the first and second abdominal segments was more common in India than the form with black ground color on these segments. The Fabrician type has red on the basal segments, whereas the type series of *C. tristis* Cameron has them black. In Sri Lanka females with red on the first and second segments were about as common as those with black ground color, but males with black were more abundant than those with some or all of the basal segments red by a ratio of 2:1. Both color forms occurred together at several localities. Turner also noted that the pale maculations were pale yellow in India; however, the pale maculations in Ceylonese specimens are usually white, but sometimes creamy or rarely yellow on the abdomen.

Cerceris dissecta nests in level ground and preys primarily upon flea beetles but sometimes mixes in a few weevils.

FEMALE.—Length 5.5–7.0 mm. Black, the following white except that markings on abdomen are sometimes creamy or rarely yellow: basal two-thirds of mandible, clypeus except apex of lamella and apical margin, supraclypeal area, streak on interantennal lamella, side of face to just above antennal fossa, scape beneath, lateral spot on pronotal disk, tegula, band on postscutellum, fore and mid femora beneath on basal half or two-thirds, outer surface of tibiae, fore and mid tarsi, hind basitarsus, mediobasal spot on second abdominal tergum, fascia on third tergum very broad laterally and narrowing substantially toward midline or interrupted there, transverse band on fifth tergum extending almost to side, usually a lateral spot variable in extent on second sternum. The following light red in about half of the specimens: mid and hind coxae, trochanters, first and second abdominal segments, the latter frequently only on basal half except for the basal pale spot; flagellum testaceous beneath. Forewing with a small vaguely defined infumation at apex beyond marginal cell, stigma and veins brown.

Head (Figures 16, 17) width 1.7 times distance from clypeal apex to anterior ocellus and 1.9 times least interocular distance; clypeus with a low subapical transverse lamella having an arcuate apical margin, apical margin of median lobe slightly emarginate and with a weak blunt lateral tooth.

Propodeal enclosure smooth, micropunctate, median groove well developed but not crenulate; hind coxa carinate along inner margin beneath.

First abdominal segment usually slightly shorter than greatest width but 1.2 times as long as width in one unusually small specimen; none of terga with medioapical fovea; pygidium (Figure 41); base of second sternum with a weak platform the edges of which are gradually declivous; fifth sternum not dentate posterolaterally.

MALE.—Length 5.5–7.4 mm. Pattern of pale maculations as in female except fifth abdominal tergum black and sixth tergum with broad fascia extending to sides; light red markings present in only a third of specimens, never as extensive as in female, first abdominal tergum usually with dark median blotch, at most basal half of second segment red except pale spot on tergum. Forewing as in female.

Head (Figure 54) width 1.5 times distance from clypeal apex to anterior ocellus and 1.9 times least interocular distance; apical margin of median lobe of clypeus weakly tridentate, lateral fimbria one-fifth clypeal width.

Propodeal enclosure and hind coxa as in female.

First abdominal segment 1.2–1.3 times as long as greatest width; pygidium (Figure 74); second sternum as in female; sixth sternum with posterolateral tooth.

SPECIMENS EXAMINED.—NORTHERN PROVINCE. *Vavuniya District*: 1♀, Parayanalankulam, irrigation canal, 25 mi NW Medawachchiya, 100 ft, 20–25 Mar, Davis et al. (USNM). *Mannar District*: 1♀, 0.5 mi NE Kokmotte, Wilpattu Natl. Park, 50–100 ft, 22–23 Jan, Krombein et al. (USNM); 1♂, Kondachchi, Ma Villu, 11–12 Apr, Krombein et al. (USNM).

NORTH CENTRAL PROVINCE. *Anuradhapura District*:

4♀, 24♂, Hunuwilagama (includes Wildlife Soc. Bungalow, 200 ft), (1♂ in Malaise trap, 200 ft), 10–19 Mar, 22–26 May, 28 Oct–3 Nov, Davis et al., Hevel et al., Krombein et al. (USNM); 3♀, 3♂, Padaviya (includes archaeological site and Padaviya tank), 180 ft, 12–22 Mar, 20–21 May, 11–14 Oct, Karunaratne et al., Krombein et al. (USNM). *Polonnaruwa District*: 1♂, Mannampitiya, 24–26 Dec, Karunaratne (USNM).

EASTERN PROVINCE. *Trincomalee District*: 1♀, 3♂, Trincomalee, China Bay Ridge Bungalow, 0–100 ft (1♀ in Malaise trap), 26 Feb, 12–17 May, Krombein et al. (USNM). *Amparai District*: 1♂, Maha Oya, 26 Nov, Keiser (Basel); 1♂, Weragan-tota, 13 Nov, Keiser (Basel); 4♂, Lahugala Sanc-tuary, 13–14 Jun, Krombein et al. (USNM).

NORTH WESTERN PROVINCE. *Puttalam District*: 1♀, 1♂, Deduruoya, 8 Mar, Perera (Lawrence).

WESTERN PROVINCE. *Colombo District*: 1♂, Laxa-pathiya, 13 mi S Colombo, 15–30 Jan, Perera (Lawrence); 23♀, 45♂, Colombo (includes Mu-seum Gardens, 50 ft), 4, 11–15, and 28–31 Jan, 7–14, 17–23, and 25 Feb, Mar, Apr, May, 16, 21, and 23 Aug, Oct, 2, 11–21, and 24 Nov, Guna-wardane, Karunaratne, Krombein et al., Perera, Stubbs et al., Wickwar (USNM, London, Law-rence, Colombo); 8♀, 9♂, Gampaha Botanic Gar-den, 28 Jun, 27 Sep, Krombein et al. (USNM); 1♀, Katunayake, near airport, 16 Jan, Krombein et al. (USNM); 3♀, 12♂, Ratmalana, near airport, 13 and 19–21 Jan, 15 Feb, 6 Jun, Krombein et al. (USNM).

SABARAGAMUWA PROVINCE. *Ratnapura District*: 1♀, Rakwana, 3 May, Henry (Colombo).

UVA PROVINCE. *Monaragala District*: 5♀, Angu-nakolapelessa, 100 m, (3 in Malaise trap), 21–23 Jan, Krombein et al. (USNM).

SOUTHERN PROVINCE. *Galle District*: 4♀, 3♂, Hin-iduma, 20–28 Feb, Perera (Lawrence). *Hambantota District*: 1♀, 16 mi E Uda Walawe, 7 Feb, 2775 B, Krombein (USNM); 8♀, 27♂, Palatupana (in-cludes Yala, Palatupana tank, 10–20 m), (1♀ in Malaise trap), 18–20 Jan, 3–7 Feb, 8–10 Mar, 29 Mar–2 Apr, 2675 A, 62178 A, Krombein et al. (USNM).

MISCELLANEOUS. 1♂, Ceylon, Mus. Westerm. (Copenhagen).

9. *Cerceris vischnu vischnu* Cameron, new status

FIGURES 18, 19, 42, 59, 69, 79

Cerceris Vischnu Cameron, 1890:250, 254, 255, pl. 10: figs. 7x, 7xa, 7xb [♀, ♂; Barrackpore, Poona; type series in Ox-ford].—Bingham, 1897:308 [misspelled *C. vischnu*].—Dalla Torre, 1897:481.—Turner, 1912:812, 813, figs. 54, 78 [Abu, Kangra Valley, Ceylon; synonymized *C. dolosa*].—Bohart and Menke, 1976:589.

Cerceris dolosa Nurse, 1903:525, 526 [♀, ♂; Mt. Abu; lectotype in British Museum].

I agree with Turner's synonymy of *C. dolosa* under *C. vischnu*. I have studied the unique female type of *C. roepkei* Maidl (1926:225) from Java (Leiden) and find that it agrees very well with *C. vischnu* except in some details of coloration. A male of *C. roepkei* from Simalar Island in the East Indies agrees with that sex of *C. vischnu* except in the same details of coloration. I consider that the East Indian taxon should be placed as *C. vischnu roepkei*, new status. The most striking colorational difference is that the nominate subspecies has the coxae, trochanters, and femora (male only at base) light red, whereas these parts are black in *C. v. roepkei*, and in having a narrower apical yellow fascia at apex of third tergum and a shorter transverse yellow bar at apex of fifth tergum (sixth in male) in the nominate subspecies, and broader markings on these terga in *C. v. roepkei*.

Nurse described *C. dolosa* from both sexes and noted the locality as "Mt. Abu; common." The syntype series in the British Museum consists of eight females and three males, each bearing a typed label "Abu." One female and one male bear an additional label, "Type," and the female a third label, "*Cerceris/dolosa*/(Nurse)"; I have selected this latter female as the lectotype.

Cerceris v. vischnu and *C. wickwari* Turner are the most melanistic Ceylonese taxa of *Cerceris*. Pale fasciae on the abdominal terga occur on only the third and fifth terga in the females and are limited to the third, fifth (*C. wickwari* only), and sixth in

the males. These two taxa are separated on other color characters, *C. v. vischnu* having the bases of the legs and first abdominal sternum red, and in lacking pale markings on the thorax except for a tiny dot on the tegula, whereas *C. wickwari* lacks red on the legs, but the first and base of second abdominal segments are red, and has pale spots on the pronotum, tegula, and postscutellum. The female of *C. v. vischnu* has a small clypeal process above the apical margin of the median lobe, but *C. wickwari* lacks such a process.

Cerceris v. vischnu occurs both in Sri Lanka and India, and its range eventually may be found to extend farther southeastward. It is widely distributed in Sri Lanka in both the Dry Zone and Wet Zone in areas of low to heavy rainfall and at elevations from near sea level to 2200 ft.

Ceylonese specimens of this taxon have the bases of legs red as detailed in the following descriptions; however, I have noted that some Indian females have no red on legs. If similarly colored females are found eventually in Sri Lanka, they should be readily separated by the very reduced pale markings on the head and thorax.

Cerceris v. vischnu nests in sloping coarse sand and preys upon chrysomelid beetles.

FEMALE.—Length 8.5–10.9 mm. Black, the following ivory to pale yellow: basal third of mandible, median clypeal lobe except apex, narrow streak on supraclypeal area and interantennal prominence, scape beneath, small anterior spot on tegula, small spot at apex of forefemur anteriorly, anterior surface of fore and mid tibiae, fascia on apical third of third abdominal tergum, apical stripe on median half or two-thirds of fifth tergum, and broad fascia on third sternum. The following ferruginous: mid and hind coxae, trochanters, base of anterior femur, mid femur on anterior surface and basal half of upper surface, hind femur beneath and anteriorly, and first sternum. The following testaceous: flagellum beneath, fore and mid tarsi. Forewing with an infumation extending from anterior half of first submarginal cell through marginal cell to wing apex, stigma black, veins dark brown.

Head (Figures 18, 19) width 1.8 times distance from clypeal apex to anterior ocellus and 2.1 times least interocular distance; apical margin of median lobe of clypeus with blunt lateral tooth and a pair of narrowly separated truncations on median half, clypeal disk with a narrow low lamella with an angulate apical margin above median lobe; supraclypeal area not protuberant.

Propodeal enclosure obliquely rugulose on basal half, arcuately rugulose on apical half, median groove well developed on at least basal half; ventral surface of hind coxa strongly carinate on inner margin.

First abdominal segment 0.9 times as long as greatest width; none of terga with medioapical fovea; pygidium (Figure 42); basal area of second sternum scarcely raised into a platform; fifth sternum not dentate posterolaterally.

MALE.—Length 5.5–8.8 mm. Color and wings as in female except mandible dark, clypeus dark or with only a small median spot, front dark except narrow streak along middle of inner eye margin and occasional spot on interantennal prominence, fifth tergum sometimes immaculate, and fourth sternum occasionally with small lateral spot.

Head (Figure 59) width 1.3 times distance from clypeal apex to anterior ocellus and 2.1 times least interocular distance; clypeus (Figure 69) with apical margin of median lobe weakly tridentate, lateral fimbria of waxed hairs one-third the clypeal width.

Propodeal enclosure and hind coxa as in female.

First abdominal segment 0.9 times as long as greatest width; pygidium (Figure 79); base of second sternum with a very weak semicircular platform; sixth sternum not dentate posterolaterally.

SPECIMENS EXAMINED.—NORTHERN PROVINCE. *Vavuniya District*: 1♀, Oddichudan, Nov (Colombo).

NORTH CENTRAL PROVINCE. *Anuradhapura District*: 4♂, Padaviya (includes tank and archaeological site), 180 ft, 18 and 20–21 May, Krombein et al. (USNM); 1♂, Galapitawewa, 19 Mar, Karunar-

atne et al. (USNM). *Polonnaruwa District*: 1♂, 16 mi N Habarana, 12 Jun, Wood et al. (USNM).

EASTERN PROVINCE. *Trincomalee District*: 1♀, Kaniyai, 12 Jul, Henry (Colombo); 1♂, Kantalai, 2–18 Aug, Karunaratne (Colombo). *Amparai District*: 3♀, 1♂, Lahugala, 13–15 Jun, Krombein et al. (USNM).

CENTRAL PROVINCE. *Matale District*: 3♂, Kibissa, 0.5 mi W Sigiriya, jungle, 28 Jun–4 Jul, Krombein et al. (USNM). *Kandy District*: 1♀, 1♂, Lady Horton's, 7 Sep, Keiser (Basel); 3♀, 3♂, Udawatkele, 1600–1700 ft, 18–21 Jan, 8–11 and 29–30 May, 3–5 Jun, 26–29 Aug, Karunaratne et al., Krombein et al. (USNM); 1♂, Thawalamtenne, 740–760 m, 16–18 Sep, Krombein et al. (USNM).

NORTH WESTERN PROVINCE. *Kurunegala District*: 3♀, Kurunegala, Badegamuwa Jungle, 14–15 Mar, 31481 A, Krombein et al. (USNM).

SABARAGAMUWA PROVINCE. *Ratnapura District*: 1♂, Belihul Oya, 10 Feb, Keiser (Basel); 1♀, Gilimale, Induruwa Jungle, 5–7 Feb, Krombein et al. (USNM); 1♂, 2 mi S Weddagala, Sinharaja Jungle, in Malaise trap, 8–12 Feb, Krombein et al. (USNM).

UVA PROVINCE. *Monaragala District*: 2♀, 2♂, Angunakolapelessa, 100 m, 21–23 Jan, 27–28 Mar, 17–19 Jun, Krombein et al. (USNM); 1♀, Randeniya, Wellawaya, 7 Jan, Henry (Colombo).

SOUTHERN PROVINCE. *Galle District*: 1♂, Udu-gama, Kanneliya Jungle, 400 ft, 6–12 Oct, Krombein et al. (USNM). *Matara District*: 1♂, Deniyaya, 20 Sep, Henry (Colombo).

10. *Cerceris eumolpicida*, new species

FIGURES 20, 21, 43, 57, 77

The female of *C. eumolpicida* agrees with females of other Ceylonese members of the *rubida* group in that the clypeal process is a low, transverse subapical lamella (Figures 20, 21). It differs from all but *C. v. vischnu* Cameron in having reduced pale markings, the clypeus being mostly black, thorax at most with lateral spots on pronotal disk and median spot on postscutellum, and forewing with only a diffused apical infumation. The py-

gidium in *C. eumolpicida* is comparatively broader (cf. Figures 43, 42), and the clypeal process is broader in relation to clypeal width (cf. Figures 20, 18).

The male is distinguished by the reduced pale maculations (clypeus with only a median spot, small paired spots on pronotum, small spot on tegula, small spot at base of second tergum, narrow apical fascia on third, and medioapical spot on sixth), the red mid and hind coxae and trochanters, and the rugulose propodeal enclosure.

The specific name is formed from Eumolpinae, a subfamily of chrysomelid beetles, and the Latin *-cida* (pertaining to killing) in allusion to the beetle prey.

HOLOTYPE.—♀; Sri Lanka, Uva Province, Monaragala District, Angunakolapelessa, 100 m, 21 Jan 1979, K. V. Krombein (12179 B, taken with prey) (USNM Type 77471).

FEMALE.—Length 7.9 mm. Black, the following creamy: basal half of mandible, clypeal process except narrow apical margin, narrow streak between antennae, small lateral spot on front, antenna beneath, small lateral spot on pronotal disk, small spot on tegula, small median spot on postscutellum, anterior surface of foretibia, mid tibia beneath and at apex outwardly, fore and mid tarsi, and narrow annulus at base of hind basitarsal segment. The following white: small basal spot on second tergum, apical fascia on third tergum narrowing gradually toward middle, small medioapical spot on fifth tergum, and broad apical fascia on third sternum. The following red: mid and hind coxae and trochanters, basal fifth of hind femur, first sternum, and median spot on basal half of second sternum. Forewing with a narrow, weak diffused infumation at apex beyond marginal cell, rest of membrane clear, stigma black, veins brown.

Head (Figures 20, 21) width 2.1 times distance from apex of clypeus to anterior ocellus and 1.8 times least interocular distance; inner margin of mandible with two teeth in middle; clypeal process a low transverse lamella terminating laterally in a blunt tooth; margin of median clypeal lobe

sinuate and with a small blunt lateral tooth; supraclypeal area not raised.

Propodeal enclosure obliquely rugulose on basal half, transversely so apically and with a weak median groove; hind coxa carinate along inner ventral margin.

First abdominal segment 1.1 times as long as wide, without a medioapical fovea; pygidium (Figure 43); second sternum with a weak basal platform.

ALLOTYPE.—♂; Sri Lanka, North Central Province, Anuradhapura District, Hunuwilagama, 22–26 May 1976, K. V. Krombein, P. B. and S. Karunaratne, D. W. Balasooriya (USNM).

MALE.—Length 7.2 mm. Black, ivory markings as in female except postscutellum without spot; white markings on abdomen as in female except sixth rather than fifth tergum with medioapical spot, and base of hind femur and hind basitarsus also white; red markings as in female. Wings as in female.

Head (Figure 57) width 1.6 times distance from apex of clypeus to anterior ocellus and 1.9 times least interocular distance; lateral fimbria of curled hairs one-third clypeal width, margin of apical lobe tridentate.

Propodeal enclosure weakly rugulose and with a weak median groove; hind coxa with a sharp carina on inner margin of ventral surface.

First abdominal segment 1.5 times as long as wide; sixth tergum without blunt tubercle; pygidium (Figure 77); second sternum with a weakly raised basal platform; sixth sternum without a posterolateral tooth.

PARATYPES.—NORTHERN PROVINCE. *Mannar District*: 1♀, 0.5 mi NE Kokmotte Bungalow, Wilpattu Natl. Park, 21–25 May 1976, K. V. Krombein, P. B. and S. Karunaratne, D. W. Balasooriya (USNM); 1♀, Pesalai Beach, 23 Jan 1978, P. B. Karunaratne, T. Wijesinhe, M. Jayaweera, G. Ratnavira (USNM); 1♂, Silavathurai, Kondachchi, 23–27 Jan 1978, P. B. Karunaratne, T. Wijesinhe, M. Jayaweera, G. Ratnavira (USNM). NORTH CENTRAL PROVINCE. *Anuradhapura District*: 4♂, same data as allotype. CENTRAL PROVINCE. *Kandy District*: 2♀, Teldeniya, 11 Jan 1954, F.

Keiser (Basel). SABARAGAMUWA PROVINCE. *Ratnapura District*: 1♀, Uda Walawe, 300 ft, 1 Aug 73, in Malaise trap in scrub-thorn forest, G. Ekis (USNM). SOUTHERN PROVINCE. *Hambantota District*: 2♀, Palatupana, 3–6 Feb 1975, K. V. Krombein, P. B. Karunaratne, P. Fernando, E. G. Dabrera (USNM); 2♀, Palatupana tank, 30 Mar–2 Apr 1981, K. V. Krombein, T. Wijesinhe, L. Weeraratunge (USNM). SOUTH INDIA. 1♀, Karnataka, Gersoppa (Jog Falls), 600 m, 19–24 Nov 1977, (Copenhagen); 1♀, Pondicherry, Karikal, Sep 1962, P. S. Nathan (Leiden); 1♀, 1♂, South Malabar, Walayar Forest, 1000 ft, Oct 1955, P. S. Nathan (Corvallis); 1♀, Singara, 3400 ft, Jun 1954, P. S. Nathan (Corvallis); 1♂, Devala, 3200 ft, Apr 1961, P. S. Nathan (Leiden); 1♂, Kerala, Walayar Forest, 700 ft, Oct 1959, P. S. Nathan (Leiden); 2♂, Coimbatore, Sep 1953, P. S. Nathan (Corvallis). CENTRAL INDIA. 4♀, Jabalpur, 1600 ft, Sep 1957, P. S. Nathan (Corvallis). Paratypes have been deposited in the Colombo and British Museums.

Female paratypes are 7.0–9.5 mm long, the pale markings may be occasionally light yellow rather than ivory and white, the first tergum is red in Indian specimens, and the spots on pronotum and postscutellum may be lacking occasionally. Male paratypes are 6.5–7.7 mm long, the pronotum is entirely black in one, and the abdominal maculations are yellowish in two specimens.

11. *Cerceris bifasciata* Guérin

FIGURES 24, 25, 45, 50, 60, 80

Cerceris bifasciatus Guérin, 1835: p1. 71: fig. 9 [♀]; 1844:443 [Bengal; type in Genoa].—Smith, 1871:369 [listed].
Cerceris bifasciata Guérin.—Smith, 1856:451.—Girard, 1879: 925, pl. 73: fig. 9.—Schletterer, 1887:487.—Cameron, 1890:248.—Bingham, 1897:312.—Dalla Torre, 1897: 453.—Turner, 1912:806, 807 [suggests that *C. instabilis* is the same].—Guiglia, 1948:179 [type depository].—Bohart and Menke, 1976:578 [listed].
Cerceris instabilis Smith, 1856:452, 453 [♀; India, China; type in London]; 1871:370.—Saussure, 1867:92.—Schletterer, 1887:494.—Cameron, 1890:249, 253, pl. 10: figs. 4, 4a,b [China, Barrackpore, Poona, Ceylon; syn-

- onymizes *C. velox*.—Bingham, 1896:446; 1897:307, 308, fig. 86 [♀, ♂; Indian plains, Ceylon, Burma, Tenasserim].—Dalla Torre, 1897:463.—Turner, 1912:806, figs. 51, 75.—Bohart and Menke, 1976:582. [New synonymy.]
- Cerceris velox* Smith, 1875:41 [♂; India; type in London].—Schletterer, 1887:505.—Dalla Torre, 1897:480. [New synonymy.]
- Cerceris varia* Moidl, 1926:222, figs. 4, 5 [♀; Java; type in Vienna].—Vecht, 1964:356, figs. 1, 2 [♀, ♂; Java, Sumatra; synonymizes *C. obtusedentata* Moidl].—Tsuneki, 1970:20, 21, figs. 48-50 [♀, ♂; Formosa; synonymizes *C. maculiceps* Tsuneki].—Bohart and Menke, 1976:588, 589 [listed]. [New synonymy.]
- Cerceris obtusedentata* Moidl, 1926:235 [♂; Java; type in Vienna]. [New synonymy.]
- Cerceris maculiceps* Tsuneki, 1963:30-32, figs. 66, 67 [♂; Patalung, Thailand; type in Kobe]. [New synonymy.]
- Cerceris varia kalensis* Tsuneki, 1972:4, fig. 3 [♂; Formosa; type in Tsuneki coll., Mishima]. [New synonymy.]

I have examined the types of *C. instabilis* Smith and *C. velox* Smith in the British Museum and agree with Cameron's (1890) finding that they are synonymous; however, the senior synonym for this taxon is *C. bifasciata* Guérin. I have not seen Guérin's type in the Genoa Museum, but a female from Kataragama, Ceylon, was compared with the type by J. van der Vecht in 1962. He noted that the type differed only in having "black on face less extensive and segm. 3 and 5 entirely yellow dorsally." These differences are inconsequential; the extent of yellow, red, and black is quite variable, and some Ceylonese and Indian specimens are as yellow as noted for the type.

The type female of *C. varia* agrees with Ceylonese specimens in all important details of structure and punctuation. It differs in having a small yellow spot on the upper mesopleuron and no red on the propodeum; however, some South Indian females are quite similar in coloration, and I consider that *C. varia* falls within the range of color pattern for this variable species. I agree with van der Vecht's synonymy of *C. obtusedentata* under *C. varia*. The unique type of the former falls within the range of color pattern for this variable species. Tsuneki (1970:20) synonymized his *C. maculiceps* from Thailand under *C. varia* Moidl; I have examined the holotype male and confirm that it is the same as *C. bifasciata*.

There is great variability in coloration of the extensive material available from both Sri Lanka and South India. Probably this is true throughout its extensive range, for van der Vecht (1964:356) comments that the synonymous *C. varia* Moidl shows a tendency toward melanism at low elevations in south Sumatra and west Java. Males in the Indian subcontinent are comparatively less erythristic and more melanistic than females from the same localities. Some of the normal yellow markings, especially on the top and sides of the female head, are obscure or lacking in the most erythristic individuals.

Within Sri Lanka the most erythristic individuals occur in the extreme southeast in very xeric areas (Palatupana, Kataragama) at low elevations. These specimens were collected in Jan and Feb, so it is unknown whether there may be seasonal variation. Black areas are almost completely lacking in females, but males usually have the top of the head, scutum, and fourth and fifth terga half or entirely black. In addition to the usual yellow markings, males from Palatupana have many reddened areas including sides of head, thorax except edges of scutum, metapleuron, propodeum except enclosure, first two and last abdominal segments, and parts of third to fifth terga and of fourth to sixth sterna.

Females from elsewhere in Sri Lanka have the top of the head and dorsum and sides of thorax black except where there are yellow markings, propodeal enclosure black, and black areas of variable extent on the second to fifth terga. Males from parts of Sri Lanka other than the xeric extreme southeast are more melanistic. The most extensive red areas include large spots on propodeum, first and last abdominal segments, parts of the second tergum and of the second through sixth sterna; more melanistic specimens, some from the same localities as the more erythristic, lack red on the propodeum and have it elsewhere on the sides of the first tergum and part of the second sternum. Some of the yellow markings are variable in these males also as follows: top and side of head may have one or two pairs of spots or none; scutellum may be banded or black;

propodeum may have a small pair of lateral spots; and mesopleuron may have a small spot above.

Cerceris bifasciata occurs in Sri Lanka primarily in Dry Zone areas from sea level to about 300 ft and with rainfall not exceeding 50"–75". It occurs sparingly in the Wet Zone and principally at low altitudes with rainfall not over 150". One female was captured with its weevil prey.

The female of *C. bifasciata* belongs to a group of five species in which the clypeus has a low transverse lamella overhanging the apex of the median lobe. It is distinguished from all but *C. p. pulchra* Cameron by the strong, well-defined infuscation at apex of forewing. It is separated from the latter taxon by the presence of two strong teeth on inner margin of mandible instead of one weak one and the broader head (cf. Figures 22, 24). The male is distinguished by the strong infuscation at apex of forewing, the presence of yellow maculations on second, third, fifth, and sixth terga except in very erythristic specimens, the apically tridentate median lobe of clypeus, and the weakly developed platform at base of second abdominal sternum.

FEMALE.—Length 9.1–10.1 mm. Ground color predominantly black or light red as noted in preceding discussion, the following bright yellow except markings on top and sides of head sometimes lacking in erythristic individuals: basal half of mandible, clypeus except apices of lamella and median lobe, supraclypeal area, streak on interantennal lamella almost to ocellus, side of front to above antennal fossa, scape, streak along posterior eye margin sometimes extending onto occiput, arcuate band on vertex, pair of large spots or band on pronotal disk, outer half of tegula, bands on scutellum and postscutellum, spot on upper mesopleural plate, a spot of variable size on posterolateral propodeal area, coxae and trochanters, anterior surface of fore and mid tibiae and sometimes on hind, fore and mid tarsi, spot on base of second abdominal tergum, second and fifth terga entirely or only on posterior half, and third sternum. Apex of forewing with a well-defined infuscation beyond marginal cell, stigma and veins medium brown to amber.

Head (Figures 24, 25) width twice the distance from clypeal apex to anterior ocellus and 1.8 times least interocular distance; mandible with two strong teeth on inner margin; clypeus with low transverse lamella with angulate apical margin just above apical margin of median lobe, the latter sinuate and with a blunt lateral tooth.

Propodeal enclosure with a crenulate median groove, anterior half with weak oblique rugulae, posterior half with arcuate rugulae; hind coxa (Figure 50) carinate along inner margin beneath.

First abdominal segment 1.1 times as long as greatest width; none of terga with medioapical fovea; pygidium (Figure 45); second sternum with weak basal platform the sides of which are gradually declivous to rest of sclerite; fifth sternum not dentate posterolaterally.

MALE.—Length 7.4–10.4 mm. Ground color predominantly black or red as noted in preceding discussion, the following bright yellow: basal half or more of mandible, clypeus except narrow apical margin, supraclypeal area, streak on interantennal prominence, side of face to just above antennal fossa, scape beneath or entirely, tiny spot behind upper posterior margin of eye and sometimes on vertex, large spots or band on pronotal disk, outer half or more of tegula, scutellum dark or with a pair of spots or band, postscutellum with band, usually small spot on upper mesopleural plate, propodeum with a small lateral spot or immaculate, coxae beneath or immaculate, trochanters, femora almost entirely black or largely yellow, fore and mid tibiae on outer surface or entirely, hind tibia at base outwardly or entirely beneath and on exterior basal half, fore and mid tarsi, sometimes hind basitarsal segment, usually spot on base of second abdominal tergum, band of variable width on apical part of third tergum, narrow or broad fascia on fifth and sixth terga sometimes interrupted on midline, and second sternum entirely or with a broad apical fascia.

Head (Figure 60) width 1.6 times distance from clypeal apex to anterior ocellus and twice the least interocular distance; apical margin of me-

dian lobe of clypeus feebly tridentate; clypeal fimbria one-fourth the clypeal width.

Propodeal enclosure and hind coxa as in female.

First abdominal segment with length 1.3 times greatest width in smallest specimens, ranging to 0.9 times in the largest; pygidium (Figure 80); second sternum with a weak basal platform as in female but this sometimes reduced to a pair of very weak tubercles; sixth sternum not dentate posterolaterally.

SPECIMENS EXAMINED.—NORTHERN PROVINCE. *Jaffna District:* 1♀, Nov (Colombo); 2♀, Kilinochchi, 80 ft, 24–27 Jan, Krombein et al. (USNM). *Mannar District:* 5♀, 2♂, Ma Villu (includes Cashew Corp. and Kondachchi), 22–28 Jan, 17–21 Feb, 11–12 Apr, Karunaratne et al., Krombein et al. (USNM, Colombo); 5♂, 0.5 mi NE Kokmotte, Wilpattu National Park, 50–100 ft, 22–23 Jan, 15–16 Feb, 21–25 May, Krombein et al. (USNM); 1♀, Parayanalankulam, 10 Apr, Krombein et al. (USNM).

NORTH CENTRAL PROVINCE. *Anuradhapura District:* 1♀, 7♂, Hunuwilagama, 22–26 May, Krombein et al. (USNM); 1♂, Horowupatana, 8 Oct, Henry (Colombo); 1♀, Kalawewa, 19 Jan, Henry (Colombo); 1♀, Cheddikulam, Malaratu Oya, 15–16 Jun, Messersmith et al. (USNM); 3♀, 3♂, Pada-viya (includes tank, antiquities site), 12–22 Mar, 20–23 Jul, Karunaratne et al., Krombein et al., 1♀, 2♂ in Malaise trap (USNM); 2♀, 1♂, Anuradhapura, 19 Feb, Nov, Stubbs et al. (London, Colombo); 1♂, Galkadawala, 13 Mar, Karunaratne et al. (USNM). *Polonnaruwa District:* 3♂, Polonnaruwa, 20 Jan (2 at light), 4 Jul, Karunaratne (Colombo).

EASTERN PROVINCE. *Trincomalee District:* 2♀, 2♂, Kantalai, 2–18 Aug, 11 Nov, Karunaratne, Keiser (Colombo, Basel); 3♀, 14♂, Trincomalee (includes China Bay, China Bay Ridge Bungalow, and 7 mi W Trincomalee), 0–100 ft, 27–31 Jan, 26 Feb, 13–17 May, 8–11 Oct, Krombein et al. (USNM); 1♂, Tennamaravadi, 20 Mar, Karunaratne et al. (USNM). *Amparai District:* 1♀, 1♂, Lahugala Sanctuary, 13–15 Jun, Krombein et al. (USNM); 1♀, Maha Oya tank, 70 m, 15 Sep, Krombein et al.

(USNM); 2♂, Inginiyagala (includes Samudra Gardens, 250 ft), 10 Jun, 22–23 Nov, Hevel et al., Krombein et al. (USNM).

CENTRAL PROVINCE. *Matale District:* 1♀, 1♂, Dambulla, 6 Feb, Keiser (Basel); 1♂, 3 mi E Naula, 15 Jun, Wood et al. (USNM); 2♂, Sigiriya, 17 Jun, Messersmith et al. (USNM); 2♂, Kibissa, 0.5 mi W Sigiriya, jungle (in Malaise trap), 28 Jun–4 Jul, Krombein et al. (USNM). *Kandy District:* 1♂, Kandy, Udawattakele Sanctuary, 2100 ft, 5–15 Jul, Karunaratne (USNM); 1♀, 1♂, Thawalammenne, 740–760 m, 21 Mar, 16–18 Sep, Krombein et al. (USNM); 1♂, Haragama, 14 Jan, Keiser (Basel).

NORTH WESTERN PROVINCE. *Puttalam District:* 1♀, 17 mi SE Puttalam, 18 Jun, Wood et al. (USNM); 1♂, swamps 10 mi E Puttalam, 2 Feb, Brinck et al. (Lund); 1♂, Karaitivu, 8 Feb (Colombo); 1♀, Eluamkulam, 1–5 Mar, Karunaratne (Colombo).

WESTERN PROVINCE. *Colombo District:* 1♀, 3 mi S Padukka Rubber Est., 19 Apr, Halstead (San Francisco); 1♀, Colombo Museum Garden, 28–31 Jan, Krombein et al. (USNM); 1♂, Labugama Reservoir, 16 Feb, Krombein et al. (USNM); 1♀, 4♂, Gampaha Botanical Garden, 14 Jan, 24 May, 27 Sep, Krombein et al., Messersmith et al. (USNM). *Kalutara District:* 1♂, Morapitiya, near Agalawatta, 13–14 Oct, Hevel et al. (USNM).

SABARAGAMUWA PROVINCE. *Ratnapura District:* 1♂, Uggalkaltota, 350 ft, 20 Jun, Krombein et al. (USNM).

UVA PROVINCE. *Monaragala District:* 1♀, Bibile, 20 Jul, Henry (Colombo); 1♀, Kataragama, 7 Jan, Keiser (Basel); 1♀, Angunakolapelessa, 100 m, 23 Jan, 12379 C, Karunaratne (USNM); 4♂, along Mau Aru, 10–13 mi E Uda Walawe, 16–19 Jun, 24–26 Sep, Krombein et al. (USNM).

SOUTHERN PROVINCE. *Hambantota District:* 8♀, 21♂, Palatupana (includes Palatupana tank, 15–50 ft, and WLNP Society Bungalow), 18–20 Jan, 2–6 Feb, Krombein et al. (USNM).

12. *Cerceris pulchra pulchra* Cameron, new status

FIGURES 22, 23, 44, 61, 81

Cerceris pulchra Cameron, 1890:250, 253, 254, pl. 10: fig. 5a,b [♀, ♂; Barrackpore, Poona; type series in Oxford].—

Bingham, 1897:308 [Barrackpore, Bombay; specimens from Sikkim and Northwest Provinces possibly misidentified].—Dalla Torre, 1897:470.—Turner, 1912:808, 809 [Barrackpore, Nuddea, Bengal].—Bohart and Menke, 1976:585.

Cameron described *C. pulchra* from both sexes from Barrackpore (Rothney) and Poona (Wroughton) and noted that it was represented by numerous specimens of both sexes. The series standing above *C. pulchra* in Oxford consists of ten females of *C. pulchra* and one female of *C. tristis*. The latter specimen bears a rectangular label that is blank on the upper surface and has "Bombay" written on the lower surface. I exclude it as a syntype because the pale markings are white rather than yellow as specified for *C. pulchra*. The absence of males is strange in view of Cameron's remarks. I am not certain that he associated the sexes correctly, for he says the apex of the clypeus is broadly rounded, whereas it is clearly tridentate in the male of *C. pulchra*.

The other 10 females are presumed to be syntypes. One without abdomen bears a label, "Cerceris/pulchra/Cam.," in Cameron's hand. Another bears a rectangular label with "dissectus" on the upper surface and "pulchra" on the lower; *C. dissecta* is a Fabrician species from India and may have been Cameron's original identification of this species. (J. van der Vecht (1961:66) shows that *C. dissecta* cannot be the same as *C. pulchra*, for the Fabrician type lacks a raised platform at the base of the second abdominal sternum.) Another female bears a rectangular label with "pulchra" on the upper surface. Two others, one without an abdomen, bear a small square label with "3" in red ink. Figure 3 in Cameron (1890) is of *C. rothneyi*, whereas figure 5 is of *C. pulchra*; the figure numbers may have been transposed later, for figure 5 is certainly that of *C. pulchra*. I have selected as lectotype the female bearing the label with "dissectus" on the upper surface and "pulchra" on the lower.

I have studied the unique female type of *C. variaesimilis* Maidl (1926:223) from Java (Leiden) and find that it differs from *C. pulchra* only in minor but constant differences in coloration. A

series of both sexes of *C. variaesimilis* differ from both sexes of *C. pulchra* in the same color differences. In the female of *C. variaesimilis* the lateral clypeal lobes are black (yellow in *C. pulchra*), and the antennae and sixth abdominal segment are red (antenna infuscated above and sixth segment black in *C. pulchra*). Males of the two taxa have the same differences in antennal coloration, and the first and seventh abdominal segments are red in *C. variaesimilis*, whereas in *C. pulchra* these segments are black except for some red on the sides of the first. I consider that the population from Japan and China south to Malaya, Java, and the Philippines constitutes a discrete subspecies, *C. pulchra variaesimilis*, new status. It should be noted that *C. spinicollis* Giner Mari, 1942, and *C. fukaii basiferruginea* Tsuneki, 1963, have already been placed in the synonymy of *C. variaesimilis* by Tsuneki (1968:21). I have examined the female holotype and male paratype of *C. fukaii basiferruginea* Tsuneki from Thailand and find them to be annectent between typical *C. pulchra* and *C. p. variaesimilis*. The coloration of the female is as in the latter subspecies, but the antenna is infuscated above; in the male the coloration is as in the typical subspecies.

The female of *C. p. pulchra* is readily distinguished from other Ceylonese females in that it is the only taxon with a low transverse clypeal lamella, which has a strongly developed basal platform on the second abdominal sternum with abruptly declivous sides. The male is unique among all Ceylonese males in that the lateral clypeal lobes are black and densely hirsute, so that the yellow central part of the clypeus forms an acute triangle toward apex (Figure 61).

Cerceris p. pulchra occurs in both the Wet Zone and the Dry Zone in Sri Lanka with rainfall ranging from less than 50" to over 200" and at altitudes from sea level to 2100 ft.

FEMALE.—6.7–7.5 mm long. Black, the following lemon yellow: basal two-thirds of mandible, clypeus except apex of clypeal lamella and of median lobe, supraclipeal area, streak on interantennal prominence, side of front to above antennal fossa, scape beneath, large narrowly sepa-

rated spots on pronotal disk, tegula, band on postscutellum, coxae beneath in part or entirely, trochanters, fore and mid femora, hind femur on apical half or less of outer surface, fore and mid tibiae and tarsi, hind tibia except spot at apex, round mediobasal spot on second abdominal tergum, broad apical fascia on third and fifth narrowed anteriorly toward middle, apical fascia occasionally on second sternum, and broad fascia on third. The following light red: pedicel, flagellum above, hind tarsus, first abdominal segment, sides of second tergum on basal half or entirely, and second sternum except apical half, which may be yellow at apex; flagellum testaceous beneath. Apex of forewing with strong infuscation beyond marginal cell, stigma and veins brown.

Head (Figures 22, 23) width 1.7 times distance from clypeal apex to anterior ocellus and twice the least interocular distance; clypeus with a low transverse lamella with an angulate apical margin above apex of median lobe, apical margin of lobe with a blunt lateral tooth, rest of margin slightly convex; supraclypeal area not protuberant.

Propodeal enclosure with weak oblique rugulae and a strong median groove; inner margin of ventral surface of hind coxa with a strong carina.

First abdominal segment 1.2 times as long as greatest width; none of terga with medioapical fovea; pygidium (Figure 44); second sternum with raised semicircular platform at base, the sides abruptly declivous; fifth sternum without posterolateral tooth.

MALE.—Length 5.7–6.6 mm. Color and wings as in female except clypeus with lateral lobes and lower lateral area of median lobe black, sixth abdominal tergum with broad apical fascia, red on first abdominal segment occasionally present only on sides, and usually only on base of second sternum.

Head (Figure 61) width 1.8 times distance from clypeal apex to anterior ocellus and twice the least interocular distance; black areas of clypeus with dense decumbent vestiture, apical margin of median lobe tridentate, the lateral fimbria of curled hairs half as wide as lateral lobe.

Propodeal enclosure and hind coxa as in female.

First abdominal segment 1.2 times as long as greatest width; pygidium (Figure 81); platform at base of second sternum weaker than in female; sixth sternum not dentate posterolaterally.

SPECIMENS EXAMINED.—NORTHERN PROVINCE. *Mannar District*: 2♀, Kondachchi, Ma Villu, 11–12 Apr, 1 in Malaise trap, Krombein et al. (USNM).

EASTERN PROVINCE. *Amparai District*: 1♂, Lahu-gala Sanctuary, 13–14 Jun, Krombein et al. (USNM).

CENTRAL PROVINCE. *Kandy District*: 1♂, Peradeniya Experiment Station, 6 Jun, Keiser (Basel); 16♀, 25♂, Kandy, Udawattakele Sanctuary, 2100 ft, 16–31 Aug, 1–17 and 20–27 Sep, Karunaratne (USNM).

WESTERN PROVINCE. *Colombo District*: 1♂, Battaramulla, 19 Dec, Henry (Colombo); 1♂, Labugama Reservoir, 16 Feb, Krombein et al. (USNM); 1♀, 1♂, Gampaha Botanical Garden, 24 May, 27 Sep, Krombein et al., Messersmith et al. (USNM); 1♂, Udugalla, 12 mi from Colombo, 15 Feb, Perera (Lawrence); 1♀, Alawala, 26 mi NE Colombo, 17 Jan, Brinck et al. (Lund).

SABARAGAMUWA PROVINCE. *Kegalla District*: 1♀, Kitulgala, Parawalathanna, 20–22 Feb, in Malaise trap, Hubbard et al. (USNM); 1♀, Mawannella, 18 Nov, Keiser (Basel). *Ratnapura District*: 1♀, Gilimale, Induruwa Jungle, 5–7 Feb, Krombein et al. (USNM).

SOUTHERN PROVINCE. *Hambantota District*: 1♀, Palatupana, 3 Feb, Krombein et al. (USNM).

13. *Cerceris specifica* Turner

FIGURES 30, 31, 48, 51, 66, 86

Cerceris specifica Turner, 1912:495,496 [♀, ♂?; Kandy, Ceylon; ♀ type in London].—Bohart and Menke, 1976:587.

Cerceris nagamasa Tsuneki, 1963:32–34, figs. 68–70 [♂; Chantaburi, Thailand; holotype in Kobe].—Bohart and Menke, 1976:584. [New synonymy.]

The unique male holotype of *C. nagamasa* Tsuneki agrees in all important structural details with Ceylonese males of *C. specifica*. It differs in

having somewhat more extensive yellow markings than in the most brightly maculated Ceylonese male; however, the species is quite variable in the extent of pale markings, and I consider that *C. nagamasa* falls within the variability that might be expected.

Turner described *C. specifica* from a unique female. He tentatively associated a male from Haputale, Ceylon, as the opposite sex. I have examined this male and find that it is indeed *C. specifica*.

Both sexes of *C. specifica* are different from those of other Ceylonese taxa in having a long, slender first abdominal segment. This is 1.6 times as long as the greatest width in females, whereas in females of other taxa it is not over 1.2 times as long as wide and usually less. In *C. specifica* males the length is 1.7–2.3 times the greatest width, whereas in other taxa this measurement reaches 1.6–1.7 only in *C. bidentula spiniventris* Tsuneki and *C. conifera*, new species, and is usually substantially less. *Cerceris specifica* is one of the few species in which the hind coxa is not carinate along the inner ventral angle; the other three species with ecarinate hind coxae all have quite short first abdominal segments.

Cerceris specifica occurs only in the Wet Zone in areas where the average annual rainfall ranges from 75" to 200", and at altitudes of 1600–6500 ft.

This species exhibits erythrism as does *C. bifasciata*; however, in *C. specifica*, erythrism develops in populations at lower altitudes up to 2200 ft, whereas erythrism in *C. bifasciata* is greatest in populations occurring in the most xeric areas. The ground color is entirely or predominantly black, and maximum erythrism is as follows. Female: small blotch on scutellum, blotch along mesopleural-sternal juncture, fore and mid femora posteriorly, dorsal surface of first abdominal tergum, apical third of second tergum, apical two-thirds of fourth tergum, middle half of fifth tergum, all of sixth segment, and apical third of fifth sternum; male same as female except no red on mesopleural-sternal juncture, all of fifth tergum, basal third of sixth tergum, and all of

seventh segment. Turner's unique holotype female is the red form.

Cerceris specifica preys upon flea beetles, and the one aggregation I observed nested in soil with a slightly sloping surface.

FEMALE.—Length 8.2–9.5 mm. Ground color black except for light red areas in erythristic individuals as noted in the discussion above, the following pale yellow: basal half or two-thirds of mandible, clypeus except apical margin and lateral lobes in some, supraclypeal area, streak on interantennal prominence that may extend to ocellus, side of face to slightly above antennal fossa, scape beneath or entirely, narrow band on temple, band on occiput sometimes connecting with that on temple or sometimes with a separated pair of transverse spots or entirely black, band or narrowly separated spots on pronotal disk, occasionally posteromedian spot on scutum, small spot on tegula, sometimes band on scutellum, band on postscutellum, small or larger spot on upper mesopleural plate, sometimes spot on lower mesopleural plate, occasionally median band on mesosternum, sometimes metasternum, large rounded spot on posterolateral angles of propodeum, coxae and trochanters yellow or not, femora all black or yellow on part or all of anterior surface, outer surface of fore and mid tibiae and occasionally lower surface of hind tibia, sometimes fore and mid tarsi, sometimes latero-basal spot on first abdominal tergum, fascia on basal third of second tergum, broad fascia on apical two-thirds of third tergum sometimes narrowed anteriorly toward middle, apical half of fifth tergum, at least basal half of second sternum, posterolateral spots on or entire third sternum, and sometimes posterolateral spot on fourth sternum; flagellum testaceous beneath. Apex of forewing infumated beyond marginal and third submarginal cells, stigma and veins dark brown.

Head (Figures 30, 31) width 1.6 times distance from clypeal apex to anterior ocellus and 2.4 times least interocular distance; mandible with two small teeth at middle of inner margin; clypeus with a narrow, median suberect process

having an angulate emargination apically, apical margin of median lobe quinque-dentate.

Propodeal enclosure glossy, with rather numerous small punctures, median groove weak and crenulate; hind coxa (Figure 51) not carinate along inner margin beneath.

First abdominal segment 1.6 times as long as greatest width; none of terga with medioapical fovea; pygidium (Figure 48); second sternum without basal platform; fifth sternum not dentate posterolaterally.

MALE.—Length 6.7–7.7 mm. Ground color black except for light red areas in erythristic individuals as noted in the discussion above; the following light yellow: mandible often on basal two-thirds or less; clypeus entirely or with only a small median spot, streak on interantennal prominence, side of face to slightly above antennal fossa, scape beneath, pronotal disk with a band sometimes interrupted at midline, usually spot on tegula, lateral spot or a band on scutellum, band on postscutellum, spot on upper mesopleural plate, rounded spot on juncture of lateral and posterior propodeal surfaces, venter immaculate or mesosternum with pair of small apical spots and metasternum entirely, coxae dark beneath or spotted or entirely yellow, all trochanters partly or entirely, foretrochanter rarely all dark, hind femur sometimes beneath on apical half, outer surface of fore and mid tibiae, hind tibia entirely dark or yellow beneath, fore and mid tarsi except that only forebasitarsal segment yellow in very dark individuals, occasional tiny anterolateral spot on first abdominal tergum, basal third of second tergum, fascia on apical third or half of third tergum, occasionally narrow apical fascia on fourth tergum, fascia on apical two-thirds of sixth tergum, spot on pygidium unless last segment light red, at least median third of second sternum, third sternum with broad fascia or narrow, slightly interrupted apical bands, and sometimes narrow, slightly interrupted apical bands on fourth sternum.

Head (Figure 66) width 1.4 times distance from clypeal apex to anterior ocellus and 2.1 times least interocular distance; anterior margin of me-

dian lobe of clypeus slightly arcuate, lateral fimbria only one-sixth as wide as clypeus.

Propodeal enclosure and hind coxa as in female.

First abdominal segment 1.7–2.3 times as long as greatest width; pygidium (Figure 86); base of second sternum without a platform; sixth sternum not dentate posterolaterally.

SPECIMENS EXAMINED.—CENTRAL PROVINCE. *Kandy District*: 1♀, Woodside, Urugalla, 2 Apr, Henry (Colombo); 6♀, 2♂, Lady Horton's, 13 Jul, 18 and 30 Oct, Keiser (Basel); 2♀, Deiyannewela, 2 and 8 Nov, Keiser (Basel); 1♀, Madugoda, 24 Nov, Keiser (Basel); 1♀, Rangala, 2 Apr, Spangler et al. (USNM); 1♀, Peradeniya Botanical Gardens, 12 Jul, Wijesinhe (USNM); 4♀, 2♂, Udawattakele Sanctuary, 510–580 m, 1800 ft, 3–5 Jun, 26–30 Jul, 26–29 Aug, 23–25 Sep, 14–16 Oct, Davies et al., Krombein et al. (USNM); 2♂, Adams Peak Trail, 4.5 mi W Maskeliya, 1530 m and 1610–1690 m, 19–21 Oct (1♂ collected at white light), Krombein et al. (USNM); 3♀, 1♂, Thawalammenne, 2200 ft, 13 and 21 Mar, 7–8 Sep, Krombein et al. (USNM). *Nuwara Eliya District*: 1♀, 4♂, Nuwara Eliya (includes Galway Natural Reserve, 1790–1990 m), 3572 A, 7 Jan, 3 Mar, 28 May, 22–23 Oct, Henry, Keiser, Krombein (USNM, Colombo, Basel); 2♀, Kanda-ela Reservoir, 5.6 mi SW Nuwara Eliya, 6200 ft, 10–21 Feb, Davis et al. (USNM); 7♀, 5♂ Hakgala (includes Hakgala Natural Reserve), 1650–1800 m, 6000–6500 ft, 6276 A-C, 23–25 Feb, 27 Mar, 2 and 9–10 Jun, Henry, Krombein et al. (USNM, Colombo, London).

SABARAGAMUWA PROVINCE. *Kegalla District*: 1♀, Kitulgala, Bandarakele Jungle, 17–18 Mar, Krombein et al. (USNM). *Ratnapura District*: 2♂, 2 mi S Weddagala, Sinharaja Jungle (on foliage of *Macaranga digyna*, 570 m), 8–12 Feb, 23 Sep, Krombein et al. (USNM); 2♀, Gilimale, Induruwa Jungle, 7–8 Mar, 17–18 May, Krombein et al., Wood et al. (USNM).

UVA PROVINCE. *Badulla District*: 3♂, Haputale, Wickwar (London, Colombo).

MISCELLANEOUS. 3♀, 5♂, Ceylon, Nietner (Berlin); 2♂, Ceylonia, Mus. Drefs. (Copenhagen).

14. *Cerceris conifera*, new species

FIGURES 11, 12, 39, 56, 76

Cerceris conifera is the sole representative of the new *conifera* group. It is widely distributed in the Wet Zone and the Dry Zone, but has not been collected in South India. Both sexes are immediately distinguished from all Ceylonese species, the female having a subbasal conical median prominence on the clypeus, and the fourth through sixth abdominal sterna of the male being clothed with dense, short suberect hair.

The specific name is formed from the Latin *conus* (cone) and *-fera* (bearing) in allusion to the clypeal process of the female.

HOLOTYPE.—♀; Sri Lanka, Sabaragamuwa Province, Gilimale, Induruwa Jungle, 5–7 Feb 1977, K. V. Krombein, P. Fernando, D. W. Balasooriya, V. Gunawardane (USNM Type 77472).

FEMALE.—Length 9.1 mm. Black, the following pale yellow: basal half of mandible, clypeus except narrow apical margin, supraclypeal area, side of front to slightly above antennal fossa, scape beneath, large lateral spot on pronotal disk, tegula except margins, pair of narrowly separated spots on postscutellum, pair of small apical spots on mesosternum, coxae beneath, trochanters, forefemur beneath, mid femur beneath and distal half above, stripe on anterior surface of hind femur, outer surface of fore and mid tibiae and apical half beneath, narrow stripe on posterior surface of hind tibia, fore and mid tarsi, transverse band at base of second abdominal tergum, apical fascia on third gradually widening laterally, apical half of fifth, small median and pair of lateral spots on second sternum, broad fascia on third and fourth and a pair of lateral spots on fifth; flagellum light red beneath; basal two-thirds of hind basitarsus white. Forewing with a vaguely defined infumation beyond marginal cell, stigma and veins dark brown.

Head (Figures 11, 12) width 1.7 times distance from clypeal apex to anterior ocellus and 2.1 times least interocular distance; clypeus with a subbasal conical median process, apical margin

of median lobe subtruncate; supraclypeal area not strongly raised.

Propodeal enclosure with oblique rugulae on basal half except in middle, with transverse arcuate rugulae apically, median groove very feeble; hind coxa carinate beneath on inner margin.

First abdominal segment 1.1 times as long as greatest width; none of terga with apicomedian fovea; pygidium (Figure 39); second sternum with a well-developed semicircular platform at base, its hind margin not abruptly declivous.

ALLOTYPE.—♂; same locality as holotype, but 10 Oct 1980, K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, L. Jayawickrema, V. Gunawardane (USNM).

MALE.—Length 7.5 mm. Color pattern as in female except mesosternal spots lacking, basal fascia on second abdominal tergum interrupted on midline, fifth tergum immaculate, sixth with broad apical fascia, sterna immaculate except for broad fascia on third. Wings as in female.

Head (Figure 56) width 1.6 times distance from clypeal apex to anterior ocellus, and 2.2 times least interocular distance; apical margin of clypeal lobe tridentate, median tooth weak, lateral fimbria of waxy hairs one-third clypeal width.

Basal half of propodeal enclosure with oblique rugulae except in middle, apical half with weak transverse rugulae, median groove evanescent; hind coxa with a carina beneath along inner margin.

First abdominal segment 1.6 times as long as greatest width; pygidium (Figure 76); second sternum with weaker raised basal platform than female; fourth through sixth sterna with dense, short suberect hair, sixth without a posterolateral tooth.

PARATYPES.—NORTH CENTRAL PROVINCE. *Polonnaruwa District*: 1♀, 16 mi N Habarana, 12 Jun 1975, S. L. Wood and J. L. Petty (USNM). EASTERN PROVINCE. *Amparai District*: Maha Oya, 1♀, 24 Aug 1963, K. Winney (BM), 1♂, 26 Sep 1953, F. Keiser (Basel). CENTRAL PROVINCE. *Matale District*: 2♀, Sigiriya, 800 ft, 29 Jun 1978 (62978 A), K. V. Krombein (USNM); 1♀, Kibissa, 0.5 mi W Sigiriya, jungle, 28 Jun–4 Jul 1978, K. V.

Krombein, P. B. Karunaratne, T. Wijesinhe, V. Kulasekare (USNM); 1♂, 12 mi E Naula, 14 Jun 1975, S. L. Wood and J. L. Petty (USNM). *Kandy District*: 1♀, Hasalaka, 107 m, 16–19 Feb 1977, K. V. Krombein, P. B. Karunaratne, P. Fernando, D. W. Balasooriya (USNM); 1♀, 1♂, Aruppola, 14 Apr 1975, S. and P. B. Karunaratne (USNM); 1♀, Teldeniya, 11 Jul 1953, F. Keiser (Basel); 1♂, Teldeniya, Bambaragala Rock, 10 May 1975, S. and P. B. Karunaratne (USNM); 1♂, Kandy, Udawattakele, 14–20 Apr 1975, S. and P. B. Karunaratne (USNM); 3♀, 1♂, Talatuoya, 26 Nov 1953, F. Keiser (Basel). NORTH WESTERN PROVINCE. *Kurunegala District*: 1♂, Kurunegala, Badagamuwa Jungle, 24–27 Jan 1975, K. V. Krombein, P. B. Karunaratne, P. Fernando, N.V.T.A. Weragoda (USNM). WESTERN PROVINCE. *Colombo District*: 3♀, 1♂, Mirigama Scout Camp, primary jungle, 8–9 Jul 1978, K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, V. Kulasekare, L. Jayawickrema (USNM); 1♀, 1♂, Nugegoda, Pappiliyana (♀, 3–4 May 1975, ♂, 11 Mar 75), P. B. Karunaratne (USNM); 3♂, Colombo Museum Garden, 28–31 Jan 1975, K. V. Krombein, P. B. Karunaratne, P. Fernando (USNM); 2♀, 2♂, Labugama Reservoir, 1♂, Reservoir Jungle, 2–4 Feb 1977, K. V. Krombein, P. B. Karunaratne, P. Fernando, D. W. Balasooriya, V. Gunawardane (USNM), 2♀, 1♂, 16 Feb 1975, K. V. Krombein, P. B. Karunaratne, P. Fernando, S. Karunaratne (USNM); 1♀, Ratmalana Airport, 13 Jan 1977, K. V. Krombein, P. Fernando, D. W. Balasooriya, V. Gunawardane (USNM); 1♀, Arakawila Jungle, Padukka, 10 Dec 1969, P. B. Karunaratne (USNM); Gampaha Botanic Garden, 4♀, 3♂, 14 Jan 1977, K. V. Krombein, D. Fernando, D. W. Balasooriya, V. Gunawardane, 5♂, 28 Jan 1979, K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, S. Siriwardane, T. Gunawardane, 1♀, 2♂, 4 Mar 1979, K. V. Krombein, T. Wijesinhe, S. Siriwardane, L. Jayawickrema, V. Gunawardane, 2♀, 5♂, 27 Sep 1980, K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, L. Jayawickrema, V. Gunawardane, 2♀, 6♂, 8 Nov 1977, K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, M. Jay-

aweera (USNM). *Kalutara District*: 1♀, Battaramulla, 2 Dec 1927, G. M. Henry (Colombo). SABARAGAMUWA PROVINCE. *Ratnapura District*: Gilimale, Induruwa Jungle, 4♀, 4♂, 5–7 Feb 1977, K. V. Krombein, P. Fernando, D. W. Balasooriya, V. Gunawardane, 1♀, 7–8 Mar 1979, K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, S. Siriwardane, L. Jayawickrema, 1♀, 13–15 Mar 1979, K. V. Krombein, T. Wijesinhe, S. Siriwardane, L. Jayawickrema (USNM); 4♀, Gilimale Jungle, 17 Jun 1976, K. V. Krombein, P. B. Karunaratne, S. Karunaratne (USNM); 5♀, Gilimale, 19–22 Jun 1976 (61776 A, 61776 F), K. V. Krombein, P. B. Karunaratne, S. Karunaratne (USNM); 1♂, Gilimale, Induruwa Jungle, 10 Oct 1980, K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, L. Jayawickrema, V. Gunawardane (USNM); 1♂, Ratnapura, Pompakele, 25 Mar 1981, K. V. Krombein, T. Wijesinhe, L. Weeratunge (USNM); 1♀, 1♂, Uggalkaltota, 350 ft, 20 Jun 1976, K. V. Krombein, P. B. Karunaratne, S. Karunaratne (USNM). UVA PROVINCE. *Monaragala District*: 1♀, Inginiyagala, 1–5 Jun 1975, D. H. Messersmith, G. L. Williams, P. B. Karunaratne (USNM). SOUTHERN PROVINCE. *Galle District*: 5♂, Hikkaduwa, 25 Feb 1974, B. Petersen (Copenhagen). MISCELLANEOUS. 1♂, Ceylon, Mus. Western. (Copenhagen). Paratypes are in Colombo, London, Basel, Copenhagen, and the W. J. Pulawski collections.

Female paratypes are 7.4–9.8 mm long, and males are 7.4–82. mm. The pale markings in both sexes may be a lighter or brighter yellow, the postscutellum may be banded, and the hind basitarsus is rarely dark. The clypeal tubercle is weaker in a few females than figured, the second tergum may have paired spots rather than a band, and the median spot on second sternum may be lacking. Occasional males have the second tergum immaculate, or there may be a basal band rather than spots, and the second sternum may have a pair of tiny lateral spots or an apical fascia.

15. *Cerceris curculionida*, new species

FIGURES 32–34, 49, 67, 87, 88

This distinctive new species, the sole member of a new species group, is known from a short series of both sexes from Udawattakele Sanctuary Jungle, Kandy. Both sexes are distinguished from all other Ceylonese species by a combination of the noncarinate ventral inner margin of the hind coxa and the obliquely carinate propodeal enclosure. The female, in addition, has a small medioapical fovea on first abdominal tergum, the suberect clypeal process has a thickened apical margin, and the median clypeal lobe has a broad central process terminating in an acute lateral tooth (Figure 33). The species is also unusual in that it nests in almost vertical banks rather than in flat ground.

The name is derived from the Latin *curculio* (weevil) and *-cida* (pertaining to killing) in allusion to the beetle prey of the wasp.

HOLOTYPE.—♀; Sri Lanka, Central Province, Kandy District, Kandy, Udawattakele Sanctuary, 510–580 m, 10 Sep 1977, K. V. Krombein (91077 C; hovering in front of nearly vertical bank) (USNM Type 77473).

FEMALE.—Length 10.4 mm. Black, the following bright yellow: basal half of mandible, spot on median lobe of clypeus and larger spot laterally, process above with a large spot, narrow triangular mark on supraclypeal area, side of face to a level slightly above antennal insertions, four small spots on vertex, two behind posterior ocelli, two behind eye, scape beneath, pronotal disk except narrowly in middle, spot on tegula, round lateral spot on scutellum, band on postscutellum, anterior triangular spot on upper mesopleuron, large round posterolateral spot on propodeum, apex of mid and hind coxae beneath, hind trochanter beneath, spot at apex of all femora, outer surface of fore and mid tibiae and basitarsi, transverse basal spot on second abdominal tergum, broad apical fascia on third slightly narrowed toward middle, small posterolateral spot on fourth, narrow apical fascia on fifth not extending to side, paired oval spots across middle of second sternum

and small lateral spot on third sternum. The following light red: flagellum beneath, rest of tegula and rest of foretibia and fore and mid tarsi. Wings nearly clear except marginal cell and apex of forewing with well-defined infumation; stigma black, veins dark brown.

Head (Figures 32–34) width 1.5 times distance from apex of clypeus to anterior ocellus and 2.0 times least interocular distance; mandible with a large subbasal tooth on inner margin; clypeal lobe with a broad, central process terminating laterally in an acute tooth, laterad of this the margin with a weak blunt tooth; suberect process arising from base of clypeus, sides tapering slightly toward apex, apical margin thickened; supraclypeal area not strongly raised and protruding beyond interantennal lamella.

Propodeal enclosure dull, with strong, close radiating rugulae on basal two-thirds, apical third with transverse arcuate weaker rugulae, median groove absent; hind coxa not carinate beneath along inner margin.

First abdominal segment 0.9 times as long as greatest width, with a small medioapical fovea; pygidium (Figure 49); second sternum evenly convex without platform.

ALLOTYPE.—♂; same locality data as holotype, but 2100 ft, 2–13 Aug 1976, S. Karunaratne (USNM).

MALE.—Length 8.3 mm. Black, the following bright yellow: clypeus except sides, spot on supraclypeal area, sides of front to just above antennal insertions, small spot on temple behind eye, scape beneath, lateral stripe on pronotal disk, small spot on tegula, band on postscutellum, narrow streak anteriorly on upper part of mesopleuron, large rounded posterolateral spot on propodeum, small blotches beneath on mid and hind coxae and trochanters, streak beneath on all femora, outer surface of fore and mid tibiae, fore and mid tarsi, small median spot anteriorly on second tergum, broad apical fascia on second tergum gradually narrower toward midline, short posterolateral streak on third tergum, narrow apical fascia on fifth and sixth terga, broad band across middle of second sternum, and lateral spot on

third sternum; flagellum and remainder of tegula light red. Wings nearly clear, but marginal cell and apex of forewing with an infumated area, stigma black, veins brown.

Head (Figure 67) width 1.6 times distance from apex of clypeus to anterior ocellus and 2.1 times least interocular distance; clypeus more convex on upper two-thirds than in most other species, apical margin of lobe with a weak, blunt median tooth, lateral angles broadly rounded, lateral fimbria of waxed hairs one-third width; last flagellar segment concave beneath, apex subtruncate.

Propodeal enclosure with radiating rugulae on basal half, apical half finely punctate; lower surface of hind coxa not carinate along inner margin.

First abdominal segment 1.3 times as long as width, tergum without medioapical fovea; sixth tergum without blunt tubercle; pygidium (Figure 87); second sternum without basal platform but with a very faint anterolateral tubercle; sixth sternum (Figure 88) without a posterolateral tooth, apical margin with a fimbria of stiff short setae on lateral third.

PARATYPES.—3♀, 2♂, same locality as holotype: 1♀, 1♂, 9–13 Feb 1975, 2100 ft, K. V. Krombein, P. B. and S. Karunaratne, P. Fernando; 1♀, 12 Feb 1975, 2100 ft, K. V. Krombein (21275 B, specimen with prey); 1♂, 18–20 Mar 1981, K. V. Krombein, T. Wijesinhe, L. Weeratunge; 1♀, 26–30 Mar 1975, P. B. and S. Karunaratne; 1♂, 26–29 Aug 1975, D. M. Davies, S. Karunaratne, D. W. Balasooriya (all USNM). A pair of paratypes has been placed in the Colombo Museum.

Female paratypes are 8.5–9.2 mm long; the large spots on second sternum are coalesced in two specimens, and one specimen has a small lateral spot on fourth sternum. Male paratypes are 7.7 and 10.2 mm long; in both paratypes the oblique rugulae cover the basal two-thirds of the propodeal enclosure, and the evanescent anterolateral tubercle on second sternum is lacking in one.

16. *Cerceris tetradonta* Cameron

FIGURES 26, 27, 46, 64, 84

Cerceris tetradonta Cameron, 1890:250, 261, pl. 10: fig. 12a,b [♀, ♂; Poona; type in London].—Bingham, 1897:304. —

Dalla Torre, 1897:478.—Turner, 1912:506,507, figs. 15, 39 [western India from Poona to Karachi; Deesa; Abu].—Bohart and Menke, 1976:588.

Cerceris tetradonta is one of the most easily recognized of the Ceylonese species. Both sexes are distinguished by the glossy convex propodeal enclosure bearing only an evanescent median groove, the noncarinate inner margin of hind coxa, the presence of paired lateral white spots on all abdominal terga except the last, and lack of a platform at the base of the second sternum.

The species occurs in both Sri Lanka and India. Within Sri Lanka it occurs almost entirely in Dry Zone localities of quite reduced rainfall and at low altitudes.

It is unique among the Ceylonese species in that it preys upon tortoise beetles (Chrysomelidae).

FEMALE.—Length 8.0–8.7 mm. Black, the following white: mandible on basal half or two-thirds, large spot at base of clypeus and small spot on lateral lobe, side of front to upper termination of interantennal prominence, small spot on supraclypeal area, narrow streak on interantennal prominence, irregular band along posterior eye margin, paired spots on pronotal disk, tegula except inner margin, lateral spots present or not on scutellum, band on postscutellum, large spot on upper mesopleural plate and small one on lower, lateral ovate spot on propodeum, all femora with a posterior streak, outer surface of all tibiae, paired posterolateral transverse spots on first through fifth abdominal terga, and paired posterolateral transverse spots on second through fifth sterna, those on second and fifth smaller or occasionally absent. The following light red: metasternum, mid and hind coxae, trochanters, lower surface of fore and mid femora, anterior surface of foretibia, fore and mid tarsi, first and second abdominal sterna, and middle of third and fourth; antennal flagellum testaceous beneath. Forewing with very weak infumation on costal half of marginal cell extending to apex of wing, stigma and veins brown.

Head (Figures 26, 27) width 1.7 times distance from clypeal apex to anterior ocellus and 1.8

times least interocular distance; clypeus without a process, apical margin of median lobe with four blunt, equidistant teeth; supraclypeal area not protuberant.

Propodeal area convex, glossy, with a very faintly impressed median groove; posterior coxa not carinate beneath along inner margin.

First abdominal segment 0.6 times as long as greatest width, the tergum with a medioapical fovea; pygidium (Figure 46); base of second sternum without platform; fifth sternum without posterolateral tooth.

MALE.—Length 7.0–8.1 mm. Color and wings as in female except as follows: clypeus pale except apical margin of median lobe, supraclypeal area entirely pale, only a small spot above along posterior margin of eye, lower mesopleural spot frequently lacking, propodeal spots occasionally quite small, mesosternum sometimes pale at apex, mid and hind coxae pale beneath in part, sixth tergum with posterolateral transverse spot, sixth sternum sometimes with transverse posterolateral spot; and only first two sterna light red.

Head (Figure 64) width 1.5 times distance from clypeal apex to anterior ocellus and twice the least interocular distance; anterior margin of median lobe of clypeus tridentate; fimbria of waxed hairs reduced, present only on outer half of lateral lobe; last flagellar segment with lower side concave, the tip truncate.

Propodeal enclosure and hind coxa as in female.

First abdominal segment 0.7 times as long as greatest width, the tergum with medioapical fovea; pygidium (Figure 84); second sternum without basal platform; sixth sternum without posterolateral tooth.

SPECIMENS EXAMINED.—NORTHERN PROVINCE. *Jaffna District*: 2♀, Kilinochchi, 80 ft, 25–26 Jan, 12677 B and C, Krombein (USNM). *Mannar District*: 1♀, 6♂, Cashew Corp., Ma Villu, 22–28 Jan, 17–21 Feb, 11 Apr, Karunaratne et al., Krombein et al. (USNM); 1♀, 1♂, Silavathurai, Kondachchi, 23–27 Jan, Karunaratne et al. (USNM); 1♀, Mannar, 23 Jan, Karunaratne et al. (USNM).

NORTH CENTRAL PROVINCE. *Anuradhapura District*:

3♂, Hunuwilagama, 22–26 May, Krombein et al. (USNM).

EASTERN PROVINCE. *Trincomalee District*: 2♂, China Bay Ridge Bungalow, 0–50 ft, 26 Feb, 24–25 Jul, Krombein et al. (USNM).

NORTH WESTERN PROVINCE. *Puttalam District*: 1♂, Wilpattu National Park, Kali Villu, 12–24 Jun, Messersmith et al. (USNM).

WESTERN PROVINCE. *Colombo District*: 2♂, Labugama Reservoir Jungle, 2–4 Feb, Krombein et al. (USNM).

SABARAGAMUWA PROVINCE. *Ratnapura District*: 1♂, Rajawaka, 20 Jun, Krombein et al. (USNM).

UVA PROVINCE. *Monaragala District*: 1♂, Inginiyagala, 2 Sep, Keiser (Basel).

17. *Cerceris interstincta interstincta* (Fabricius)

FIGURES 28, 29, 47, 65, 85

Philanthus interstinctus Fabricius, 1798:269 [♂; India; type in Copenhagen]; 1804:306.—Thunberg, 1815:291.—Bingham, 1897:303 [lists this as a questionable senior synonym of *C. humberiana*].—Turner, 1912:813.

Cerceris interstincta (Fabricius).—Dahlbom, 1845:499.—Smith, 1856:452.—Smith, 1871:370 [listed as *interstinctus*].—Schletterer, 1887:494.—Cameron, 1890:264 [possibly ♂ of *C. humberiana*].—Dalla Torre, 1897:464.—Schulz, 1912:90 [synonymizes *C. humberiana*].—Vecht, 1961:67 [lectotype designation; probably same as *C. humberiana*].

Cerceris humberiana Saussure, 1867:97, 98 [♀; Ceylon; type in Vienna].—Schletterer, 1887:494.—Cameron, 1890:249, 266, fig. 16a,b, pl. 10 [Ceylon, Barrackpore; synonymizes *C. rufinodis* and *C. viscosus*].—Bingham, 1896:446; 1897:303 [♀, ♂; Barrackpore, Bengal, Ceylon; lists *P. interstinctus* as a questionable senior synonym].—Dalla Torre, 1897:463.—Turner, 1912:491,492 [♀, ♂; Ceylon; treats *C. viscosa* Smith as a subspecies of *C. humberiana*].—Tsuneki, 1968:33, fig. 83 [♂; Ceylon, India].

Cerceris emortualis Saussure, 1867:98, fig. 55 [♀; Ceylon; type in Vienna].—Cameron, 1890:248, 266 [probably a variety of *C. humberiana*].—Bingham, 1896:446.—Dalla Torre, 1897:458.

Cerceris interstincta interstincta (Fabricius).—Bohart and Menke, 1976:582 [Ceylon, India].

It is possible that this Ceylonese taxon should be called *C. interstincta humberiana*, but the matter cannot be resolved until material from many localities in India is available for study. Turner called the Ceylonese population *C. humberiana*

and called the Bengal specimen *C. humbertiana viscosus* Smith, basing the separation on the comparatively broader clypeal process with more distinctly emarginate apex in the Indian female. He also noted that the Indian males did not differ appreciably from those of typical *C. humbertiana*; I have noted this also in males from the two countries. The Fabrician type of *C. interstincta* is a male from India, and van der Vecht noted that *C. humbertiana* appeared to be the same. The clypeal process does not vary in the few Ceylonese females. If the clypeal process also does not vary in Indian females, then the Indian population should be known as typical *C. interstincta*, with *C. viscosa* Smith as a synonym, and the Ceylonese population should be known as *C. i. humbertiana*, and males will have to be assigned to subspecies on the basis of the country in which they occur.

I have studied the unique female type of *C. emortualis* Saussure from Ceylon and can confirm that it is a synonym of *C. interstincta* (Fabricius).

The female is distinguished by the huge suberect clypeal lamella (Figure 29), the emarginate apical margin of the pygidium, the glossy convex propodeal enclosure, and the very short carina at the base of inner margin of the ventral surface of the hind coxa. The male has a similar propodeal enclosure and carinate hind coxa; in addition it has a large subbasal tooth on inner mandibular margin (Figure 65) and a red first abdominal segment. It has been collected in Sri Lanka only in Dry Zone areas with low rainfall and at altitudes of 50 ft or less.

FEMALE.—Length 10.2–11.9 mm. Ground color predominantly light red, black areas usually restricted to apical third of mandible, narrow strip above antennal fossa to anterior ocellus and sometimes extending laterally to upper inner eye margin, extreme sides of scutellum and postscutellum, propodeal enclosure, and usually the nonyellow areas of the second through fifth abdominal terga. The following pale yellow: basal two-thirds of mandible, clypeus, streak from supraclipeal area to anterior ocellus, side of front to level of anterior ocellus, scape beneath, temple, fascia on pronotal disk occasionally narrowly separated on midline,

tegula, scutellum, postscutellum, most of mesopleuron except anterior and posterior margins, mesosternum, metasternum, large band on posterior and lateral propodeal margins, legs except black streaks above on femora, and inner apical two-thirds of hind tibia, broad spots on third and fourth terga quite narrowed anteriorly toward midline, all of fifth tergum except narrow anterior strip, and broad apical fasciae sometimes narrowly interrupted on midline on second to fourth sterna. Anterior half of forewing beyond marginal cell strongly infuscated, stigma and veins brown.

Head (Figures 28, 29) width 1.5 times distance from clypeal apex to anterior ocellus and 1.8 times least interocular distance; inner margin of mandible with two strong subbasal teeth; clypeal process large, suberect, arising from clypeal base, sides diverging slightly toward apex, apical margin of median lobe subtruncate except for large acute median tooth.

Propodeal enclosure glossy, impunctate, median line very faintly impressed; hind coxa beneath with a short carina along inner margin at base.

First abdominal segment 0.6 times as long as greatest width; first through third terga with small medioapical fovea; pygidium (Figure 47); second sternum gently convex at base, platform absent; fifth sternum not dentate posterolaterally.

MALE.—Length 8.5–9.6 mm. Ground color predominantly black, only the following light red: antenna beneath, first abdominal segment, sometimes the areas on second through fifth sterna except apical yellow areas; pale yellow maculations as in female except side of face pale to slightly above antennal fossa, temple not entirely yellow, mesopleural and propodeal markings somewhat smaller, fifth abdominal tergum with spots narrowly interrupted on midline, sixth tergum with apical fascia, and fifth sternum usually with apical fascia but sometimes with only lateral spots.

Head (Figure 65) width 1.5 times distance from clypeal margin to anterior ocellus and 2.9 times least interocular distance; mandible with a large subbasal tooth on inner margin; median lobe of

clypeus narrow, margin very weakly tridentate, lateral fimbria of curled hairs three-fourths as wide as lateral lobe; apical flagellar segment concave beneath, apex truncate.

Forecoxa acutely angulate anterolaterally; propodeal enclosure and hind coxa in female.

First abdominal segment 0.8 times as long as greatest width; first through third terga with medioapical fovea; pygidium (Figure 85); second sternum gently concave at base, platform lacking; sixth sternum lacking posterolateral tooth.

SPECIMENS EXAMINED.—NORTHERN PROVINCE. *Mannar District*: 2♀, 6♂, Ma Villu (includes Cashew Corp. and Kondachchi), 28 Jan, 17–21 Feb, Krombein et al., Karunaratne (USNM, Colombo); 1♀, Marichchukkadi, 26 Jan, Karunaratne et al. (USNM); 1♀, 8♂, Kokmotte Bungalow,

0.5 mi NE Wilpattu National Park (1♀, 1♂ in Malaise trap), 21–25 May, Krombein et al. (USNM); 1♂, 0.5 mi NE Kokmotte, Wilpattu National Park, 50–100 ft, 22–23 Jan, Krombein et al. (USNM).

EASTERN PROVINCE. *Trincomalee District*: 1♀, Paraiyalankulam, 15 May, Krombein et al. (USNM); 3♂, Trincomalee, China Bay Ridge Bungalow, 0–100 ft, 13–17 May, Krombein et al. (USNM). *Batticaloa District*: 1♂, Kalkudah, 29 Aug, Keiser (Basel).

NORTH WESTERN PROVINCE. *Puttalam District*: 1♀, 1♂, Wilpattu National Park, Kali Villu, 12–14 Jun, Messersmith et al. (USNM).

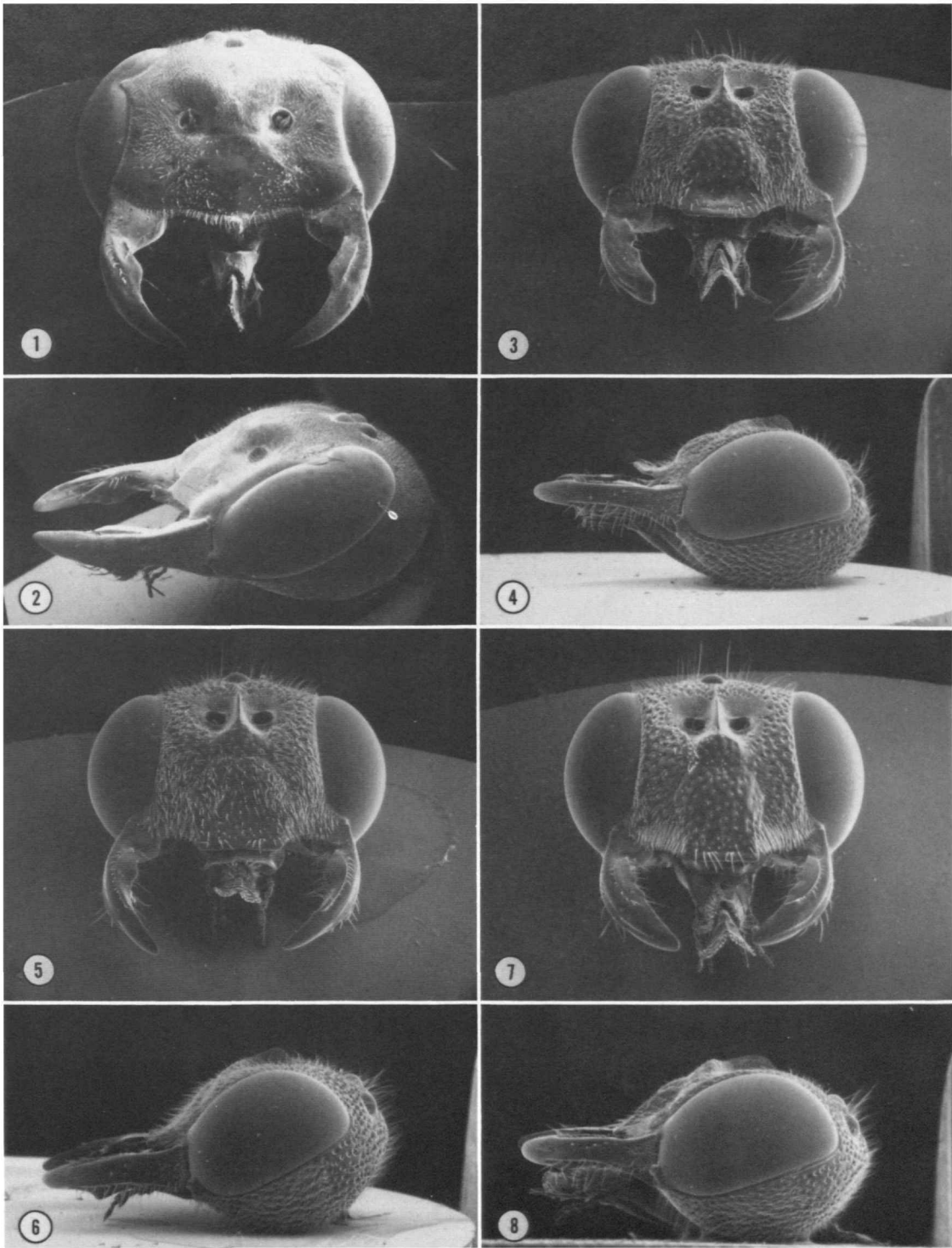
WESTERN PROVINCE. *Colombo District*: 3♀, 8♂, Colombo, Feb, Mar, Apr, Oct, Wickwar (Colombo, London).

Literature Cited

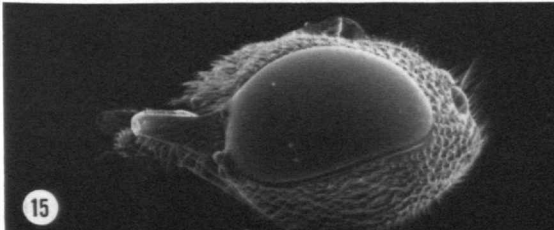
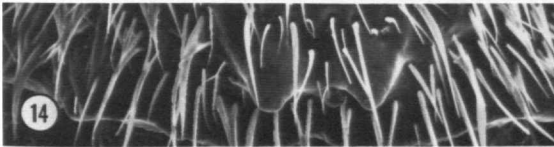
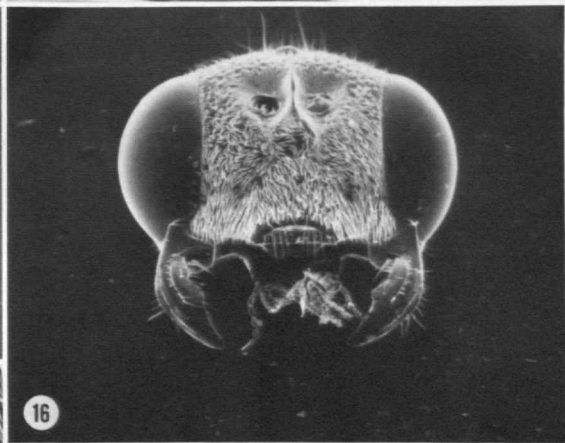
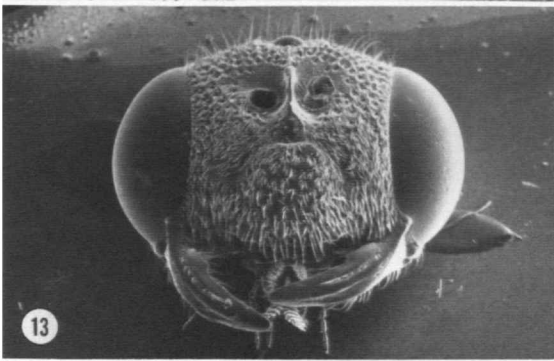
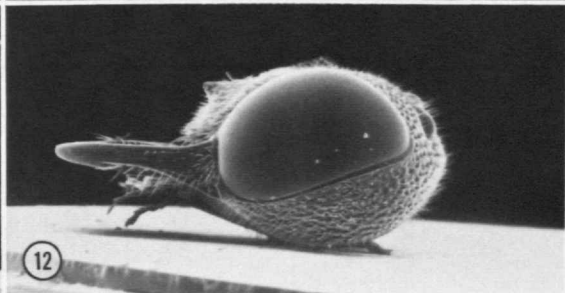
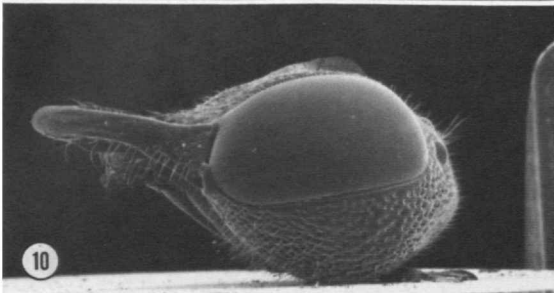
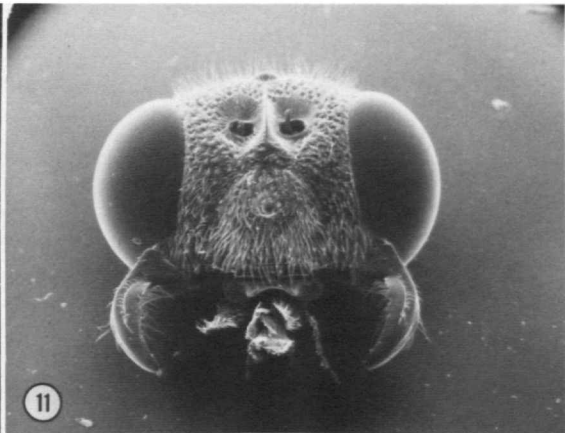
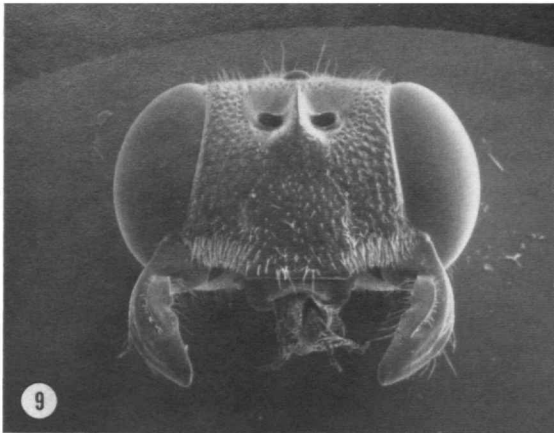
- Beaumont, J. de
 1949. Les *Philanthus* et *Philoponidea* de l'Afrique de Nord-Ouest (Hym. Sphecid.). *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 22:173–216, 66 figures.
 1951. Contribution a l'Étude des *Cerceris* Nord-Africains. *Eos, Revista Espanola de Entomologia*, 27:299–408, 79 figures.
 1952 [1950]. Les *Cerceris* de la Faune Française (Hym. Sphecidae). *Annales de la Société Entomologique de France*, 119:23–80, 220 figures.
 1960. Notes sur les *Philanthus* paléarctiques (Hym. Sphecid.). *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 33:201–212, 10 figures.
- Bingham, C. T.
 1896. A Contribution to the Knowledge of the Hymenopterous Fauna of Ceylon. *Proceedings of the Zoological Society of London*, 26:401–459, plate 15.
 1897. *The Fauna of British India Including Ceylon and Burma: Hymenoptera, 1 (Wasps and Bees)*. 579 pages, 4 plates, 189 figures.
- Bohart, R. M., and A. S. Menke
 1976. *Sphecid Wasps of the World: A Generic Revision*. 695 pages, 190 figures, 2 plates.
- Cameron, P.
 1890. Hymenoptera Orientalis; or Contributions to a Knowledge of the Hymenoptera of the Oriental Zoological Region. *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, (4)3: 239–284.
- Cooreman, J., and A. Crèvecoeur
 1948. Le cycle biologique de *Vidia concellaria* Cooreman (Acaridiae Ensliniellidae), Acarien vivant dans les nids de *Cerceris arenaria* L. (Hymenoptera, Sphecidae). *Bulletin et Annales de la Société Entomologique de Belgique*, 84:277–283, 1 figure.
- Dahlbom, A. G.
 1843–1845. *Hymenoptera Europaea praecipue borealia*. 528 pages.
- Dalla Torre, K. W. von
 1897. Fossores (Sphegidae). In *Catalogus Hymenopterorum*, 8: 749 pages.
- Fabricius, J. C.
 1798. *Supplementum entomologiae systematicae*. 572 pages.
 1804. *Systema Piezatorum*. 439 pages.
- Girard, M.
 1879. *Traité élémentaire d'entomologie*, 2: Orthoptères, Neuroptères, Hyménoptères Porte-aiguillon. 1028 pages.
- Guérin-Ménéville, F. E.
 1829–1844. *Iconographie du règne animal de G. Cuvier, Insectes*. Volume 3, 576 pages, 110 plates.
- Guiglia, D.
 1948. I Tipi di Imenotteri del Guérin Esistenti nelle Collezione del Museo di Genova. *Annali del Museo Civico di Storia Naturale di Genova*, 63:175–191, 5 figures.
- Kohl, F. F.
 1891. Zur Kenntnis der Hymenopteren-gattung *Philanthus* Fabr. (sens. lat.). *Annalen des kaiserliche königliche naturhistorischen Hofmuseums Wien*, 6:345–370.
- Krombein, K. V.
 1959. Biological Notes on Some Ground-nesting Wasps at Kill Devil Hills, North Carolina, 1958, and Additions to the Faunal List. *Proceedings of the Entomological Society of Washington*, 61:193–199.
 1964. Results of the Archbold Expeditions, Number 87: Biological Notes on Some Floridian Wasps. *American Museum Novitates*, 2201:1–27, figure 1.
- Magretti, P.
 1886. Risultati di raccolte imenotterologiche nell'Africa Orientalis. *Annali del Museo Civico di Storia Naturelle di Genova*, (2)1:523–636, 1 plate.
- Maidl, F.
 1926. Neue Indomalayische *Cerceris*-Arten. *Zoologische Mededeelingen*, 9:221–238, 39 figures.
- Motschulsky, V. de
 1863. Essai d'un catalogue des insectes de l'île Ceylan, VI: Hyménoptères. *Bulletin de la Société Imperiale des Naturalistes de Moscou*, 36:11–73, plate 2.
- Nurse, C. G.
 1903. New Species of Indian Aculeate Hymenoptera. *Annals and Magazine of Natural History*, series 7, 11: 511–526.
- Pagden, H. T.
 1934. Biological Notes on Some Malayan Aculeate Hymenoptera, II, with Descriptions of New Species. *Journal of the Federated Malay States Museums*, 17: 467–486, 12 figures.
- Saussure, H. de
 1867. Hyménoptera. In *Reise der Oesterreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859*, *Zoology*, 2: 156 pages, 4 plates.
- Schletterer, A.
 1887. Die Hymenopteren-Gattung *Cerceris* Latr. mit vor-

- zugsweiser Berücksichtigung der paläarktischen Arten. *Zoologische Jahrbücher*, 2:350-510, 1 plate.
- Schulz, W. A.
1912. Aelteste und alte Hymenopteren skandinavischer Autoren. *Berliner Entomologische Zeitschrift*, 57:52-102.
- Smith, F.
1856. *Catalogue of Hymenopterous Insects in the Collection of the British Museum, IV: Sphegidae, Larridae, and Crabronidae*. Pages 207-497.
1871. A Catalogue of the Aculeate Hymenoptera and Ichneumonidae of India and the Eastern Archipelago. *The Journal of the Linnaean Society, Zoology*, 11:285-415.
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, 12:384-415.
1875. Descriptions of New Species of Indian Aculeate Hymenoptera, Collected by Mr. G. R. James Rothney, Member of the Entomological Society. *Transactions of the Entomological Society of London*, 1875:33-70, 2 plates.
- Tennent, J. E.
1861. *Sketches of the Natural History of Ceylon with Narratives and Anecdotes Illustrative of the Habits and Instincts of the Mammalia, Birds, Reptiles, Fishes, Insects, etc., Including a Monograph of the Elephant and a description of the Modes of Capturing and Training It*. 500 pages, many unnumbered illustrations.
- Thunberg, C. P.
1815. Philanthi, generis insecti Hymenopteri, Monographia. *Nova Acta Kungliga Vetenskaps-Societeten i Upsala*, 7:126-139, 286-298.
- Tsuneki, K.
1961. Studies on *Cerceris* of North Eastern Asia (Hymenoptera, Sphecidae). *The Memoirs of the Faculty of Liberal Arts, Fukui University*, series II, *Natural Science*, 11(1): 72 pages, 121 figures.
1963. Chrysididae and Sphecidae from Thailand (Hymenoptera). *Etizenia*, 4: 50 pages, 92 figures.
1965. The Biology of East-Asiatic *Cerceris* (Hym., Sphecidae) with Special Reference to the Peculiar Social Relationships and Return to the Nest in *Cerceris hortivaga* Kohl. *Etizenia*, 9: 46 pages, 25 figures.
1968. *Cerceris* from the Western Pacific Areas (Hymenoptera, Sphecidae). *Etizenia*, 29: 36 pages, 83 figures.
1970. Studies on the Formosan Sphecidae (VII): The Subfamily Philanthinae (Hymenoptera). *Etizenia*, 44: 24 pages, 57 figures.
1972. Studies on the Formosan Sphecidae (XIV): Notes on Some Specimens Newly Examined, with a Description of a Related Japanese Subspecies (Hymenoptera). *Etizenia*, 60: 13 pages, 25 figures.
- Turner, R. E.
1912. A Monograph of the Wasps of the Genus *Cerceris* Inhabiting British India, with Notes on Other Asiatic Species. *Journal of the Bombay Natural History Society*, 21:476-516, 794-819, 4 plates.
- Vecht, J. van der
1961. Hymenoptera Sphecoidea Fabriciana. *Zoologische Verhandelingen*, 48: 85 pages, 1 figure.
1964. The *Cerceris* Species of Java (Hymenoptera Sphecoidea). *Zoologische Mededelingen*, 39:348-368, 4 figures.
1966. Notes on Some Oriental *Philanthus* Species (Hymenoptera, Sphecoidea). *Koninklijke Nederlandsche Akademie van Wetenschappen, Proceedings*, series C, 69: 420-431, 4 figures.

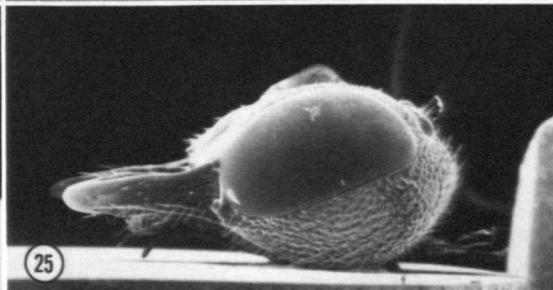
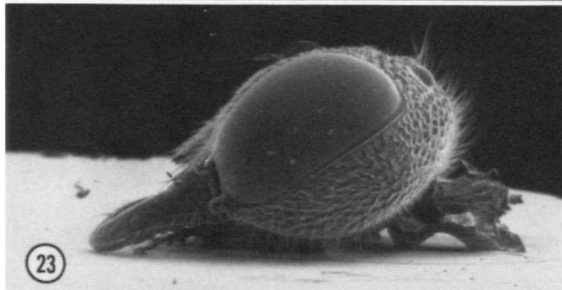
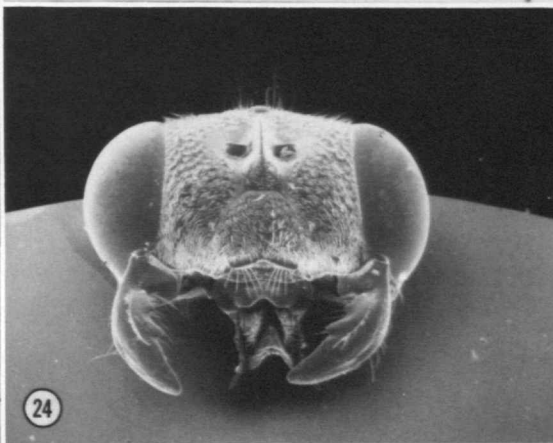
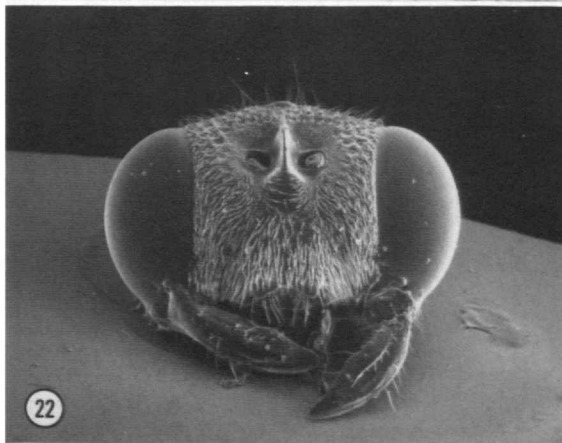
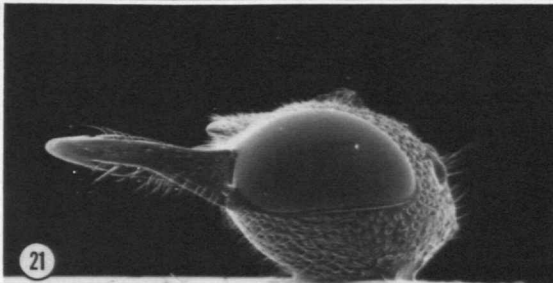
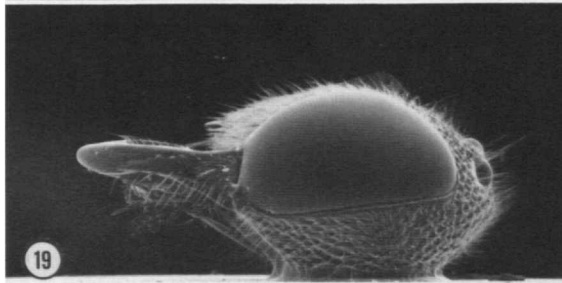
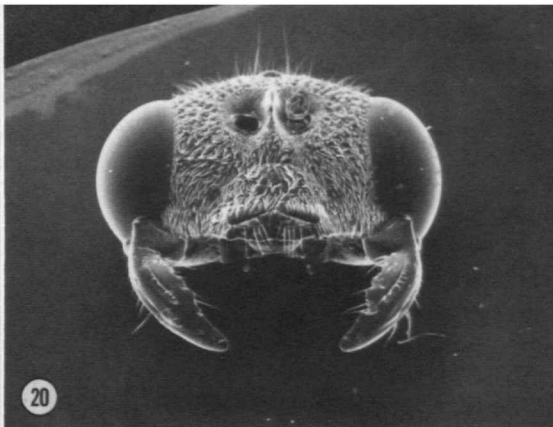
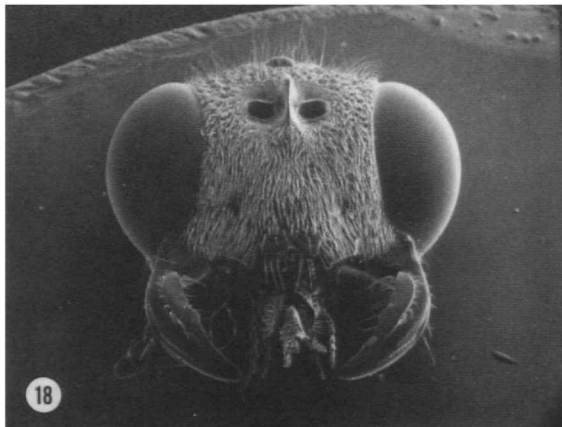
FIGURES 1-8.—Frontal and lateral views of female heads, *Philanthus* and *Cerceris*: 1, 2, *P. basalis* Smith (× 13); 3, 4, *C. intrusa*, new species (× 19); 5, 6, *C. wickwari* Turner (× 21); 7, 8, *C. pictiventris novaræ* Saussure (× 23).



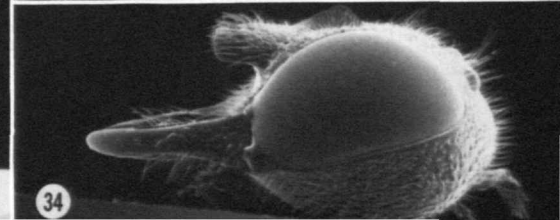
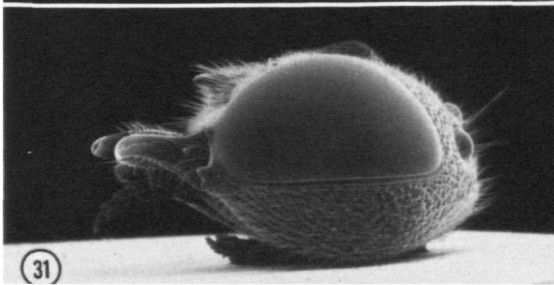
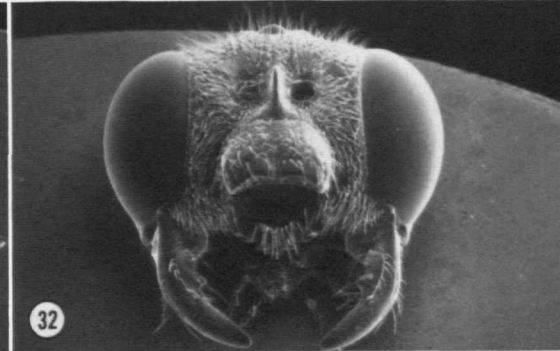
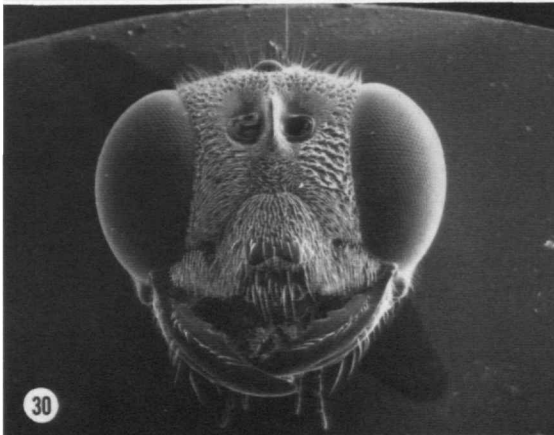
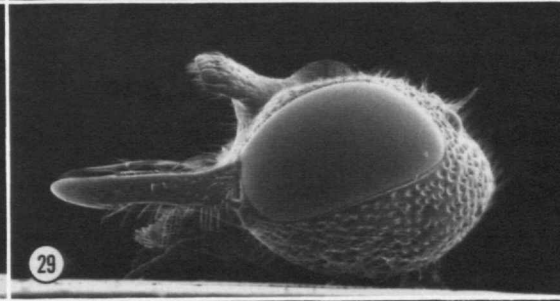
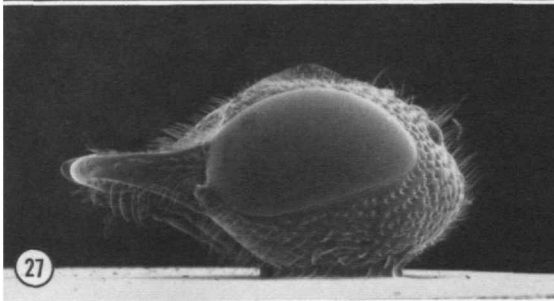
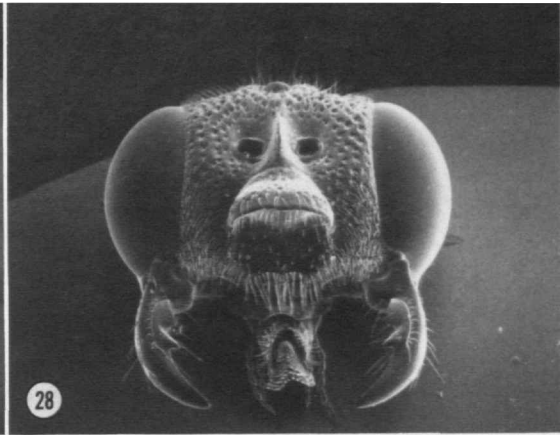
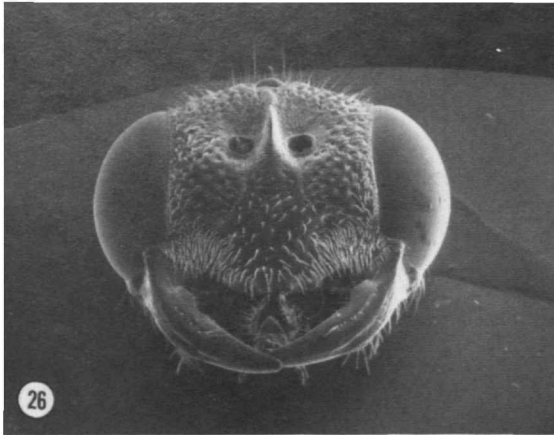
FIGURES 9-17.—Frontal and lateral views of female heads, *Cerceris*: 9, 10, *C. protea* Turner (× 20); 11, 12, *C. conifera*, new species (× 21); 13-15, *C. bidentula spiniventris* Tsuneki (13 and 15, × 26, and 14, clypeal process, × 128); 16, 17, *C. dissecta* (Fabricius) (× 27).



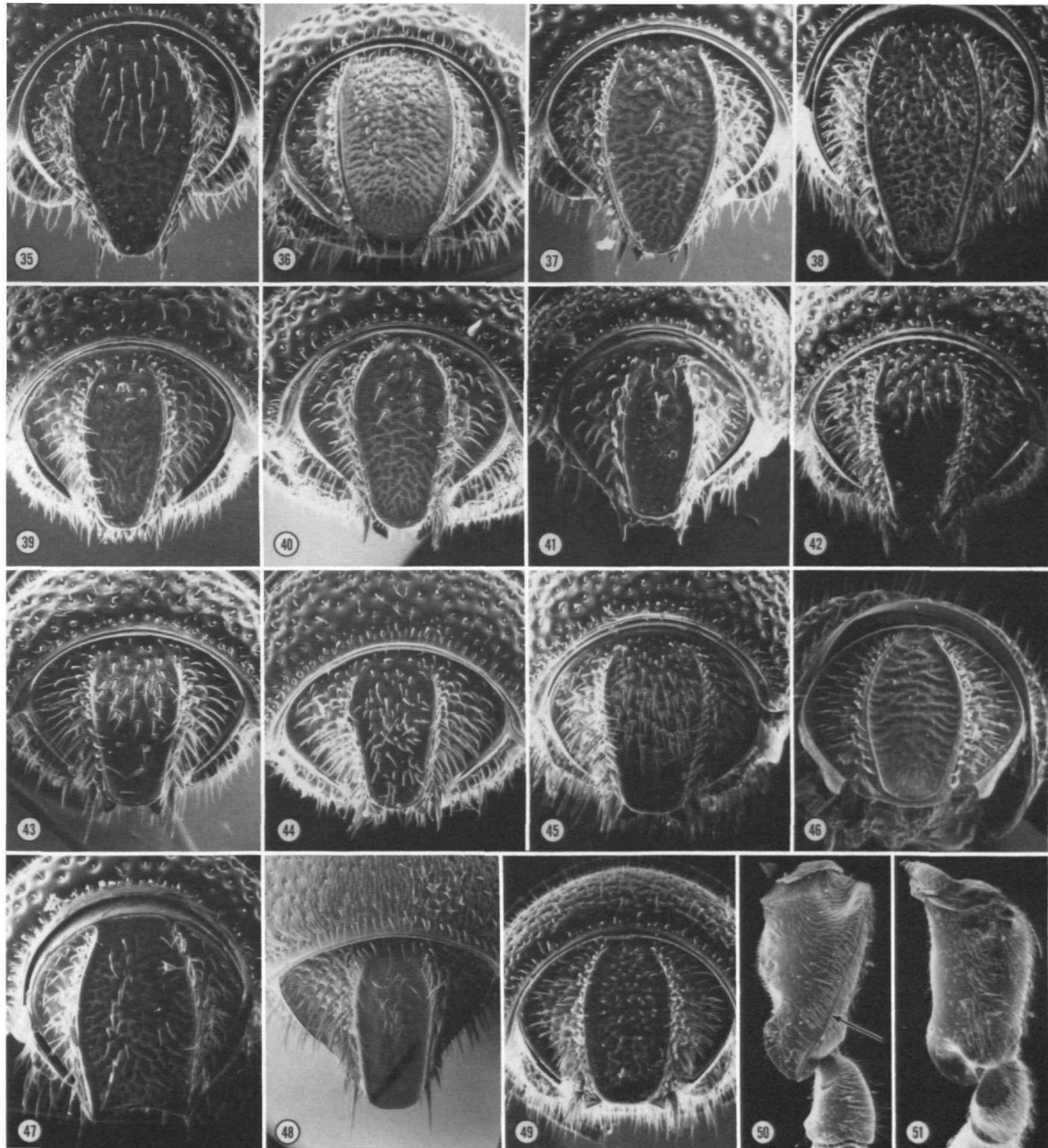
FIGURES 18-25.—Frontal and lateral views of female heads, *Cerceris*: 18, 19, *C. vischnu vischnu* Cameron ($\times 21$); 20, 21, *C. eumolopida*, new species ($\times 24$); 22, 23, *C. pulchra pulchra* Cameron ($\times 27$); 24, 25, *C. bifasciata* Guérin ($\times 17$).



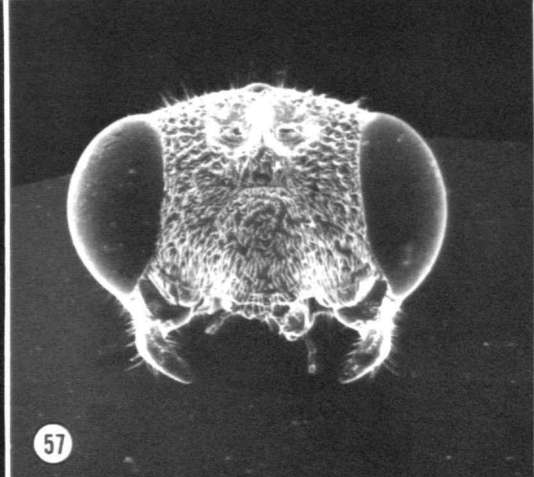
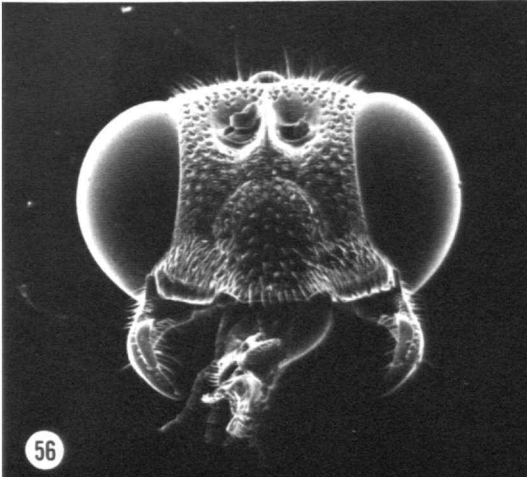
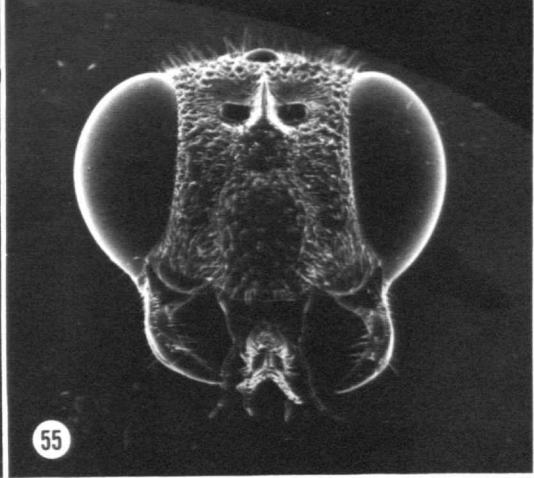
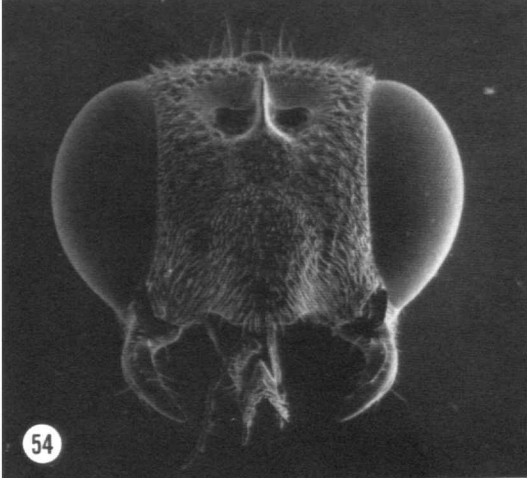
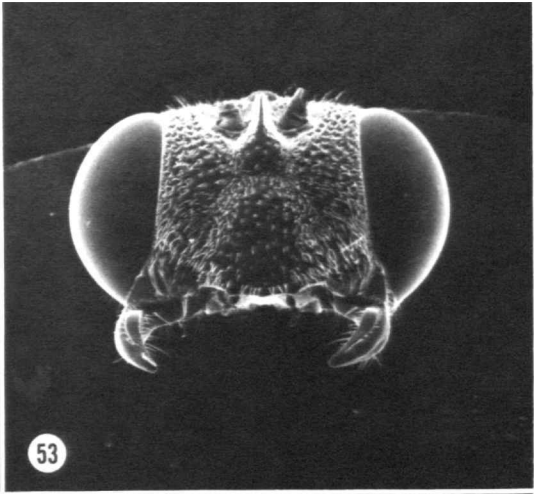
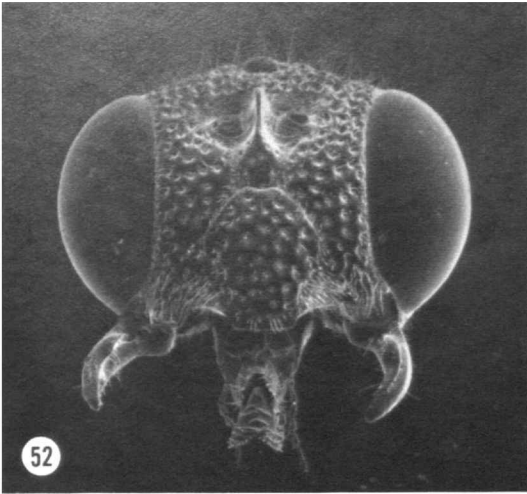
FIGURES 26-34.—Frontal and lateral views of female heads, *Cerceris*: 26, 27, *C. tetradonta* Cameron (× 22); 28, 29, *C. interstincta interstincta* (Fabricius) (× 20); 30, 31, *C. specifica* Turner (× 26); 32-34, *C. curculioncida*, new species (32 and 34, × 21, and 33, clypeal lobe margin, × 68).



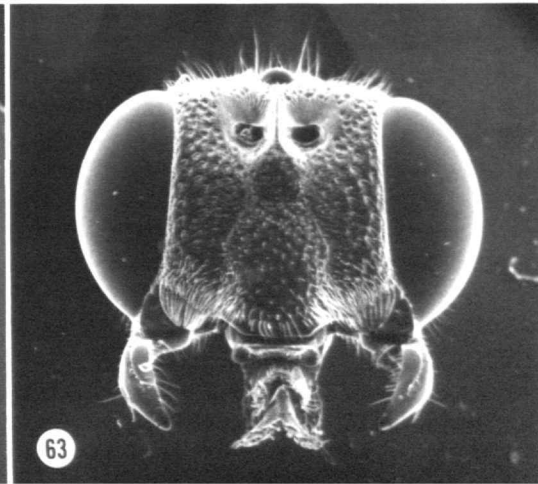
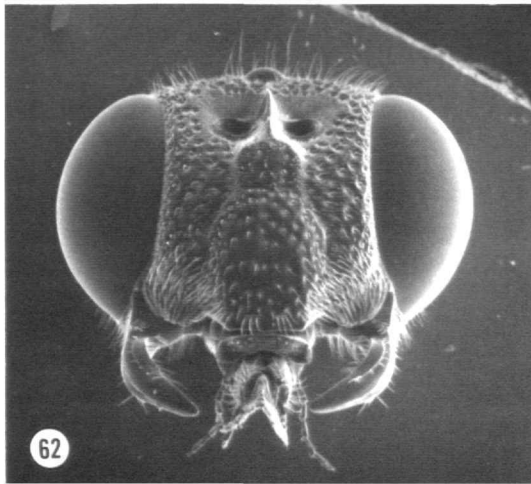
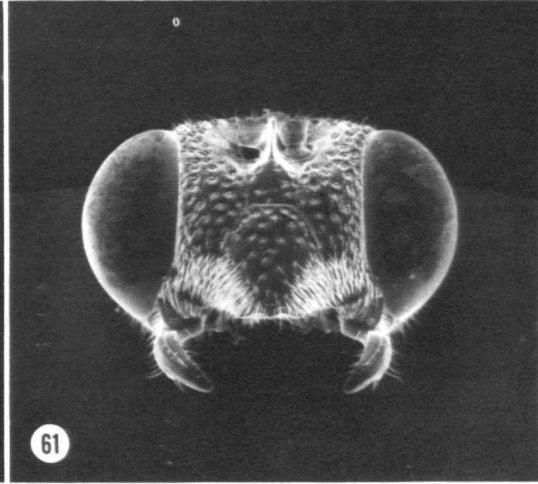
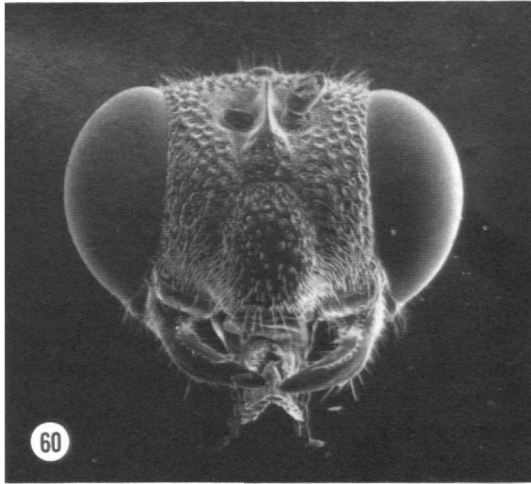
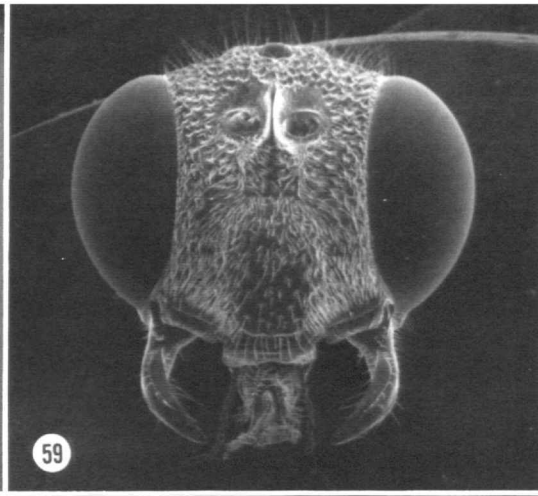
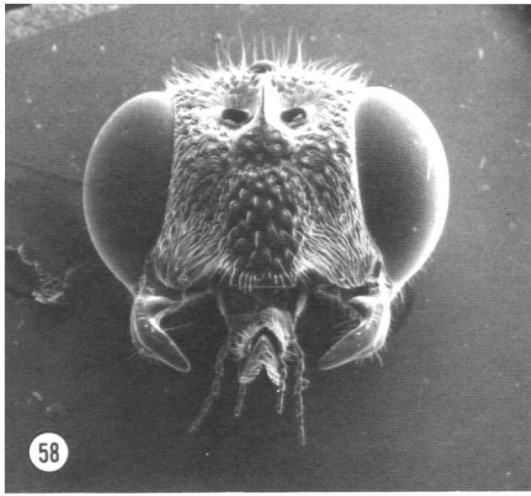
FIGURES 35-51.—Pygidium, female *Cerceris*: 35, *C. intrusa*, new species (× 33); 36, *C. wickwari* Turner (× 31); 37, *C. pictiventris novarae* Saussure (× 40); 38, *C. protea* Turner (× 33); 39, *C. conifera*, new species (× 39); 40, *C. bidentula spiniventris* Tsuneki (× 40); 41, *C. dissecta* (Fabricius) (× 45); 42, *C. vischnu vischnu* Cameron (× 32); 43, *C. eumolpicida*, new species (× 42); 44, *C. pulchra pulchra* Cameron (× 42); 45, *C. bifasciata* Guérin (× 26); 46, *C. tetradonta* Cameron (× 34); 47, *C. interstincta interstincta* (Fabricius) (× 28); 48, *C. specifica* Turner (× 35); 49, *C. curculioncida*, new species (× 30). Hind coxa and trochanter, female *Cerceris*: 50, *C. bifasciata* Guérin (× 35, note carina on inner ventral margin of coxa); 51, *C. specifica* Turner (× 42).



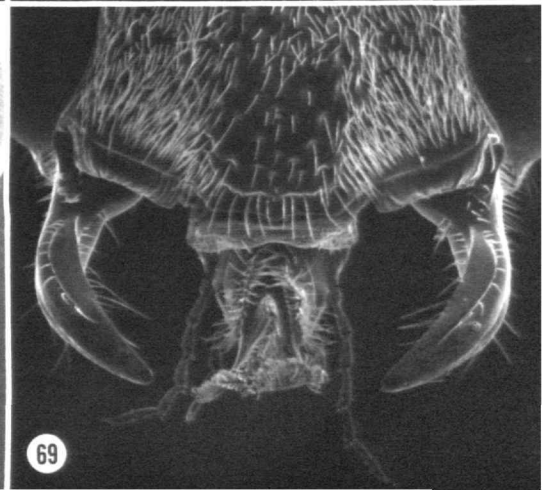
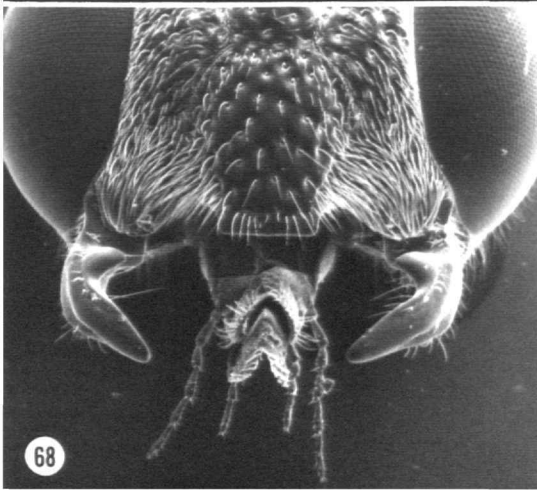
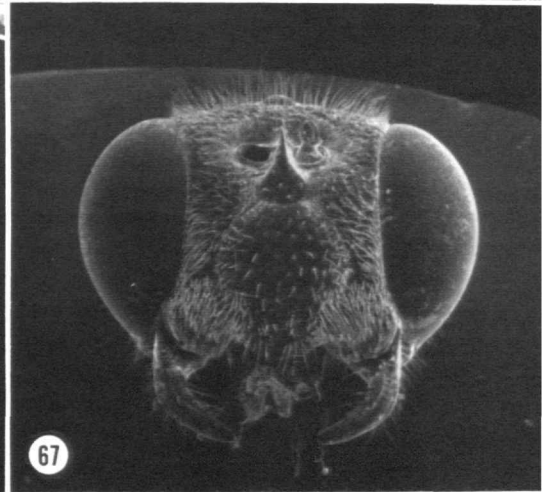
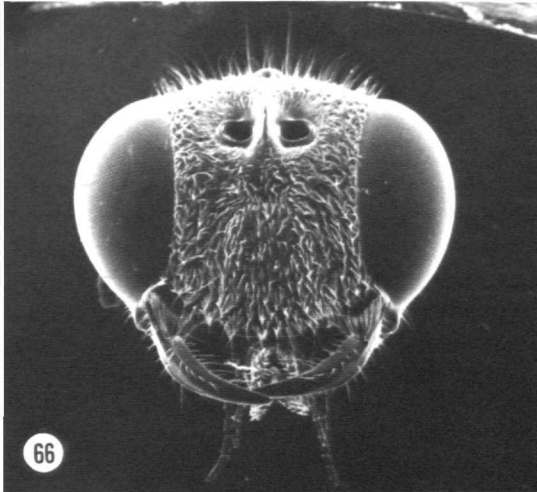
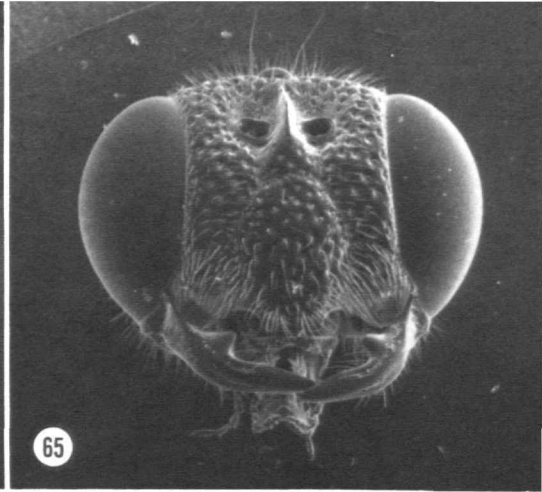
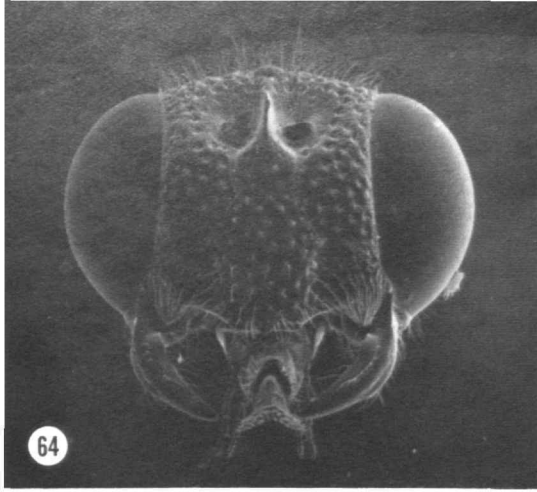
FIGURES 52-57.—Frontal view of male head, *Cerceris*: 52, *C. bidentula spiniventris* Tsuneki ($\times 33$); 53, *C. mastogaster* Smith ($\times 27$); 54, *C. dissecta* (Fabricius) ($\times 33$); 55, *C. intrusa*, new species ($\times 25$); 56, *C. conifera*, new species ($\times 26$); 57, *C. eumolpicida*, new species ($\times 29$).



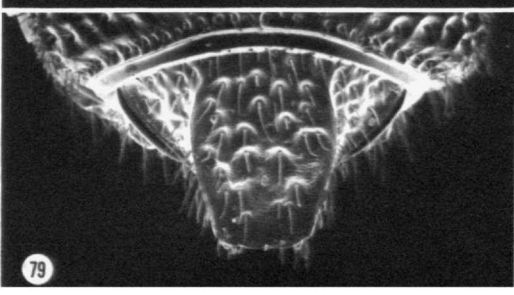
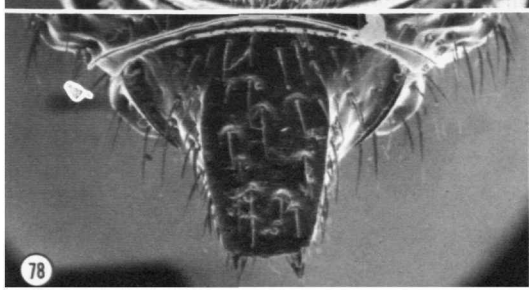
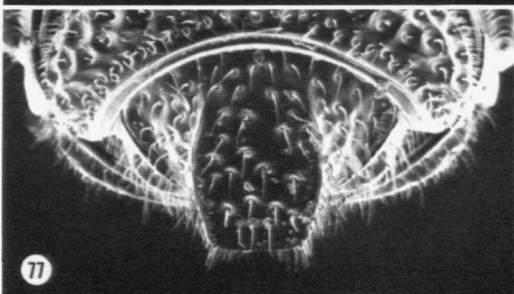
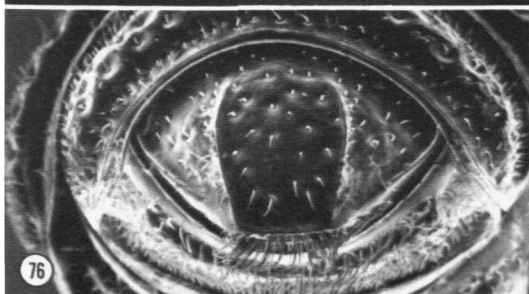
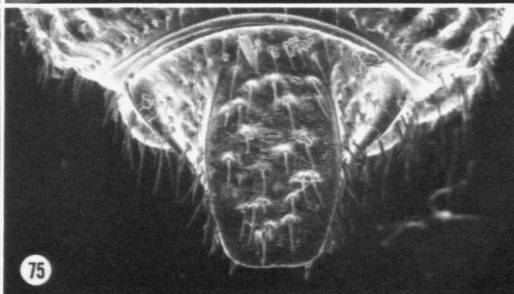
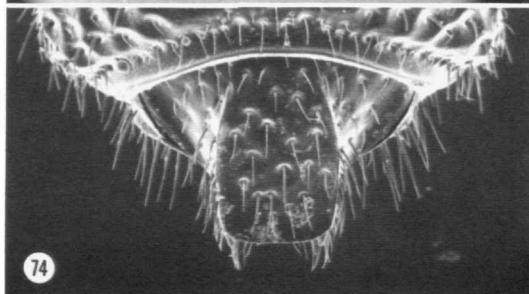
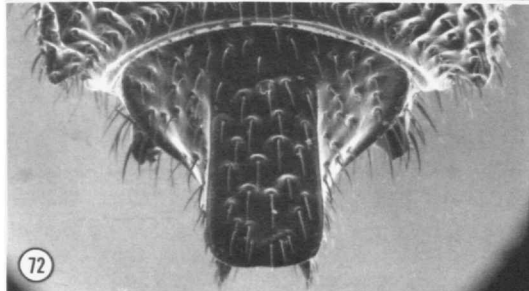
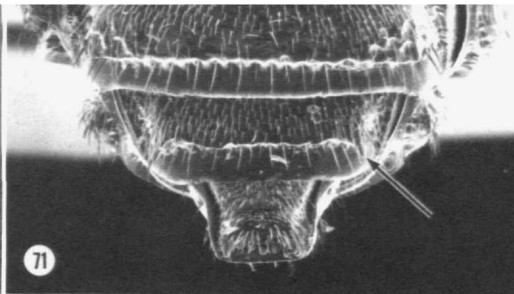
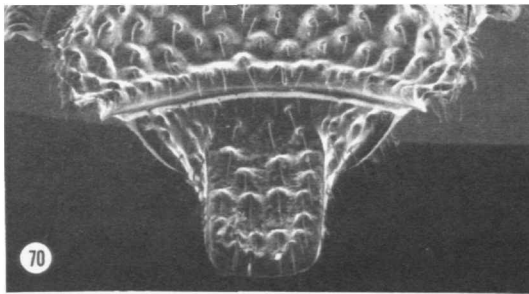
FIGURES 58-63.—Frontal view of male head, *Cerceris*: 58, *C. wickwari* Turner (× 29); 59, *C. vischnu vischnu* Cameron (× 29); 60, *C. bifasciata* Guérin (× 29); 61, *C. pulchra pulchra* Cameron (× 29); 62, *C. pictiventris novaræ* Saussure (× 29); 63, *C. protea* Turner (× 27).



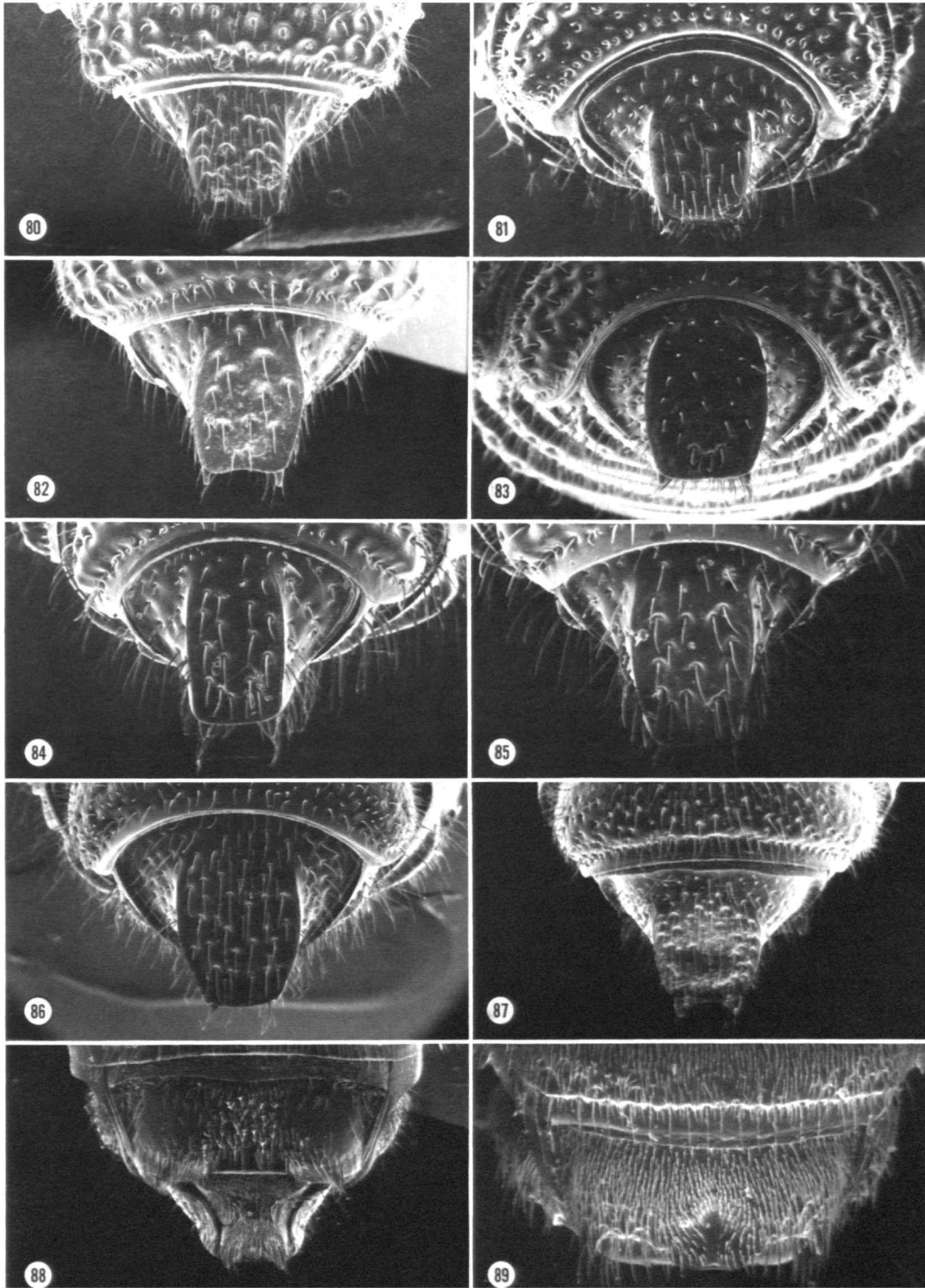
FIGURES 64-69.—Frontal view of male head, *Cerceris*: 64, *C. tetradonta* Cameron (× 29); 65, *C. interstincta interstincta* (Fabricius) (× 29); 66, *C. specifica* Turner (× 29); 67, *C. curculionica*, new species (× 24). Clypeal margin, male *Cerceris*: 68, *C. wickwari* Turner (× 40); 69, *C. vischnu vischnu* Cameron (× 43).



FIGURES 70-79.—Male pygidium, *Cerceris*: 70, *C. bidentula spiniventris* Tsuneki (× 56); 72, *C. mastogaster* Smith (× 51); 74, *C. dissecta* (Fabricius) (× 71); 75, *C. intrusa*, new species (× 53); 76, *C. conifera*, new species (× 60); 77, *C. eumolpicida*, new species (× 62); 78, *C. wickwari* Turner (× 62); 79, *C. vischnu vischnu* Cameron (× 49). Male sterna 6 and 7, *Cerceris*: 71, *C. bidentula spiniventris* Tsuneki (× 53); 73, *C. mastogaster* Smith (× 42).



FIGURES 80-89.—Male pygidium, *Cerceris*: 80, *C. bifasciata* Guérin (× 47); 81, *C. pulchra pulchra* Cameron (× 60); 82, *C. pictiventris novaræ* Saussure (× 56); 83, *C. protea* Turner (× 56); 84, *C. tetradonta* Cameron (× 54); 85, *C. interstincta interstincta* (Fabricius) (× 64); 86, *C. specifica* Turner (× 56); 87, *C. curculionida*, new species (× 38). Male sterna 6 and 7: 88, *C. curculionida*, new species (× 38). Female sternum five showing buprestid clamp: 89, *C. bidentula spiniventris* Tsuneki (× 49).



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Bibliography, depending upon use, is termed "References," "Selected References," or "Literature Cited." Spell out book, journal, and article titles, using initial caps in all major words. For capitalization of titles in foreign languages, follow the national practice of each language. Underline (for italics) book and journal titles. Use the colon-parentheses system for volume/number/page citations: "10(2):5-9." For alignment and arrangement of elements, follow the format of the series for which the manuscript is intended.

Legends for illustrations must not be attached to the art nor included within the text but must be submitted at the end of the manuscript—with as many legends typed, double-spaced, to a page as convenient.

Illustrations must not be included within the manuscript but must be submitted separately as original art (not copies). All illustrations (photographs, line drawings, maps, etc.) can be intermixed throughout the printed text. They should be termed **Figures** and should be numbered consecutively. If several "figures" are treated as components of a single larger figure, they should be designated by lowercase italic letters (underlined in copy) on the illustration, in the legend, and in text references: "Figure 9b." If illustrations are intended to be printed separately on coated stock following the text, they should be termed **Plates** and any components should be lettered as in figures: "Plate 9b." Keys to any symbols within an illustration should appear on the art and not in the legend.

A few points of style: (1) Do not use periods after such abbreviations as "mm, ft, yds, USNM, NNE, AM, BC." (2) Use hyphens in spelled-out fractions: "two-thirds." (3) Spell out numbers "one" through "nine" in expository text, but use numerals in all other cases if possible. (4) Use the metric system of measurement, where possible, instead of the English system. (5) Use the decimal system, where possible, in place of fractions. (6) Use day/month/year sequence for dates: "9 April 1976." (7) For months in tabular listings or data sections, use three-letter abbreviations with no periods: "Jan, Mar, Jun," etc.

Arrange and paginate sequentially EVERY sheet of manuscript—including ALL front matter and ALL legends, etc., at the back of the text—in the following order: (1) title page, (2) abstract, (3) table of contents, (4) foreword and/or preface, (5) text, (6) appendices, (7) notes, (8) glossary, (9) bibliography, (10) index, (11) legends.

