

HARRY W. ALLEN

*A Monographic Study of
the Subfamily Tiphinae
(Hymenoptera: Tiphidae)
of South America*

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of South America

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ABSTRACT

Allen, Harry W. A Monographic Study of the Subfamily Tiphinae (Hymenoptera: Tiphidae) of South America. *Smithsonian Contributions to Zoology*, number 113, 76 pages, 57 figures, 1972.—This paper presents keys and descriptions or descriptive notes based on type specimens of all known species of South American Tiphinae except for 8 species in which types were inaccessible. One new genus, *Mallochia* is proposed and described. The genus, *Tiphiodes* and subgenera *Tiphiodes* and *Protiphia* are sunk as synonymous. There are descriptive notes or redescrptions of *Epomidiopteron julii* Romand and the following species of the genus *Tiphia*: *pacozo* Allen; *paupei* Allen and Krombein; *intermedia* Malloch; *fulvitaris* Rohwer; *oblonga*, *campanula*, *solitaria*, *salutatrix*, *chalybea*, and *parallela* Smith; *meridonalis*, *gigantea*, *jonesii* and *elongata* Turner.

The following new species are described: in the genus *Mallochia*—*arnau*i, *alini* and *calalao*; in the genus *Tiphia*—*osborni*, *ripaliwinae*, *narinensis*, *geijskesi*, *boxi*, *savanna*, *bogota*, *insueta*, *rossi*, *ramara*, *vandervechti*, *caerulea*, *columbiana*, *huallaga*, *wosuna*, *silvae*, *surinam*, *aguacatal*, *bartica*, *phaedra*, *hodgesi*, *pallisteri*, *penai*, *lima*, *pastaza*, *ancha*, *delta*, *cuzcoa*, *maria*, *monsona*, *manni*, *browni*, *scalariformis*, *quin-cemila*, *iquitosa*, *gilvapennis*, *academae*, *bassleri*, *cosquina*, *jujuya*, *teutonia*, *sierra*, *alpha*, *gamma*, *parkeri*, *plaumanni*, *colalao*, *walzi*, *arnau*i, *beta*, *catarina*, *sao-paula*, *lassana*, *cornelliana*, *diamantina*, *cumana*, *uruouma*, *sankutei*, *makdona*, *selloi*, *cordoba*, *Michelbacheri*, *parana*, *shannoni*, *malleri*, *inuitata*, *annabella*, *corumba*, and *tonia*.

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Harry W. Allen

A Monographic Study of the Subfamily Tiphinae (Hymenoptera: Tiphidae) of South America

Introduction

In so far as my studies extend, the subfamily Tiphinae in South America is restricted to four genera: *Epo-midiopteron*, which is known to extend from Peru and French Guiana to southern Arizona; *Mallochia*, newly proposed and presently known only from southern South America; *Tiphia*, of worldwide distribution; and *Tiphoides*, proposed by Brèthes for two Argentinian species in 1913 and not identified since by other workers. The genera *Paratiphia*, *Krombeinia* and *Neotiphia*, relatively common in western North America have not been found in South America. Only the genus *Tiphia* has been commonly collected in South America. In this paper 98 species have been mentioned of which 76 are new to science.

Many of the characters used in this paper are the same as used by the author in numerous previous papers and have been recently illustrated and discussed in 1971 Transactions of the American Entomological Society, volume 97, pages 204-212.

In the South American species of the genus *Tiphia* several characters are found that are of worldwide occurrence. These include the grooved basitarsus, and the scutellar median escarpment of the female, the elongated radial cell, and the fifth sternal denticles in the male. Characters not encountered outside South America include the encircling escarpments and great-

ly enlarged punctures of the abdominal terga and the anteriomedial tubercles of the second sternum.

In arranging the data on the genus *Tiphia* it has been found convenient to consider in turn the species of four different regions; i.e. (1) the countries north of Brazil, (2) the Amazon Valley of Brazil, (3) the countries Peru, Equador, and Bolivia, and (4) southern Brazil, Uruguay, Paraguay and Argentina. In the material studied there appears to be very little overlap of species between these regions. There also appear to be very few species from the West Indies, Central America, or Mexico that also occur in northern South America. However, males taken at several localities in Panama and Venezuela I am unable to separate from *intermedia*, the most common species of eastern North America.

The average size of the first cubital cell among females in 16 species of South American *Tiphia* which have been measured is 24 times the stigmal area, with a range from 10 to 40. This seems to indicate that the species in the neotropical area differ as a group from those in western North America. In the latter area measurements have been made on 28 species. The range in size of the first cubital cell in respect to the stigma is from 5 to 34, with an average of only 14. It is noteworthy that only four species had cells smaller than the average from South America. Two of these were from the Panama Canal Zone and were respectively 30 and 34 times larger than the stigma. The other two were from the State of Puebla, Mexico, a relatively short distance from the isthmus of Tehuantepec, and were 28 and 30. It is tempting to suspect

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that these last four species represent penetration into North America of South American species, as has occurred with many other species of animals.

The subfamily Tiphinae in South America has received very little attention from systematists. In 1836, M. Romand described the brightly-marked wasp, *Epo-midipteron julii* from French Guiana. In 1855 and in 1879, F. Smith described four species from tropical Brazil and one from Colombia. No others were added until the period from 1908 to 1912 when four new species were described by R. W. Turner, five by J. Brèthes, and one by S. A. Rohwer. It is not possible to identify any of these from the original descriptions. The holotypes of all Smith's species and three of Turner's in the British Museum have been redescribed in detail by the author. A special effort has been made to learn about the present status of Brèthes' types which should be in Buenos Aires, but without results.

It is regrettable that in this monograph so many species are represented only by one sex and the holotype specimen. In only four species have both sexes been recognized and described. It seems obvious that some species have been described under one name as a male and under another as a female. However, until more data is available, it will be impossible to match these correctly.

The excellent collecting of J. van der Vecht and his associates in Surinam should be mentioned, and especially the use by D. C. Geijskes of the Malaise trap in collecting *Tiphia*. During the early 1940s the U. S. Department of Agriculture maintained a laboratory on biological control investigations at Montevideo.

During this period, H. L. Parker and his associates were able to study the parasite relationships of several Scarabaeidae in the area southward of Sao Paulo, Brazil. One species of *Tiphia* was reared in large numbers from its Scarabaeid host.

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Key to Genera of New World Tiphinae

1. Oral area broad and consisting of labium, maxilla, and a polished, triangular area below base of mandible; labium at most only slightly longer than wide; maxillary palpi large, longer than maxilla; hypostomal bridge broad 2
- Oral area elongate, narrowed, with no polished submandibular triangle, labium longer than wide; maxillary palpi small, usually shorter than maxilla; hypostomal bridge frequently narrowed 5
2. Males 3
- Females 4
3. Sixth sternum with its lateral margin deeply notched; lateral extension of radial cell usually much less than that of second cubital cell *Krombeinia* Pate
- Sixth sternum with its lateral margin never deeply notched; lateral extension of radial cell usually equal or exceeding that of second cubital cell *Tiphia* Fabricius
4. Abdominal terga and sterna terminating in polished, impunctate, ribbon-like bands; sternum 6 with broad, conspicuous, shagreened median stripe *Krombeinia* Pate
- Abdominal terga and sterna without uniform, ribbon-like bands; sternum 6 without a broad, shagreened median stripe *Tiphia* Fabricius

5. First section of radius with a long, heavily sclerotized spur almost bisecting first cubital cell 6
 First section of radius without a long, heavily sclerotized spur partly bisecting the first cubital cell, at most with a rudimentary stump at this location 7
6. Large insects with conspicuously maculated body; without trace of prepectal ridge on anterior border of mesopleuron, or sensorial area on side of first tergum... *Epomidiopteron* Romand
 Medium- to small-sized insects without maculated thorax or abdomen; usually with prepectal ridge on anterior border of mesopleuron; a large flat or depressed sensorial area on side of tergum 1..... *Paratiphia* Sichel
7. Males 8
 Females 9
8. Abdominal terga with broad, highly polished terminal belts; sternum 6 medially with conspicuous shield-shaped area..... *Neotiphia* Malloch
 Abdominal terga without broad, polished terminal belts; sternum 6 not differentiated medially into a shield-shaped area *Mallochia* Allen
9. Abdominal segments with highly polished, ribbon-like terminal bands; pygidium coarsely punctuate to its apex; sixth sternum usually with broad shagreened median stripe; tegula usually broader than long; hind tibia usually with club-shaped or furcate bristles.....
Neotiphia Malloch
 Abdomen without polished, ribbon-like terminal bands; pygidium impunctate and shagreened at its apex; sixth sternum without shagreened median stripe; tegula longer than broad; hind tibia without club-shaped or furcate bristles..... *Mallochia* Allen

Genus *Epomidiopteron* Romand

Epomidiopteron Romand, 1836:653.—Allen 1966:205.

This genus, represented by one described species, was recently redescribed in detail and literature cited (Allen 1966). It differs from the other South American genera of Tiphinae as follows: The body size is as large or larger than the largest species of *Tiphia* and *Mallochia* and in both sexes the body is conspicuously maculated. The mouth opening is elongated and the polished submandibular triangle present in *Tiphia* is lacking. The mesopleuron in both sexes lacks prepectal carinae. For a more extensive list of references see Allen 1966.

1. *Epomidiopteron julii* Romand

Epomidiopteron julii Romand, 1836:653.—Allen 1966:206.

The descriptive notes below are abstracted from a recent detailed redescription based on one specimen from the type locality lent by Dr. Kelner-Pillault of the Paris Museum, and the other specimens listed below. Dr. Karl Krombein of the Smithsonian Institution thinks that the type of this distinctive species is a female in the Munich Museum which bears the following labels: "Cayenne/coll-Guerin," "Cay.," "Coll. Guerin"; and "Epomidiopteron/julii/Rom./Cayenne." An *Epomidiopteron* considered to be *julii* oc-

curs as far north as southern Arizona. For a more extensive list of references see Allen 1966.

FEMALE.—Body color black with broad yellowish white spots on clypeus, mesopleuron, scutellum, metanotum, pygidium, and laterally on pronotum and the first 4 abdominal segments. Front with impunctate ridge bordering inner eye orbit. Mandible with massive preapical denticle. Dorsal pronotum with transverse carina complete but not buttressed. Lateral pronotum without anterior process; disc with a mixture of punctures and obscure rugulae. Scutum without anteromedian escarpment. Legs black to reddish brown. Middle and hind tibia on outside with spines subobsolete except for dorsal row; hind tibia on inner face carinate on basal half without visible sensorium. Tegula rectangular, 1.6 times as long as wide, completely fine shagreened. Wing black violaceous; spur from first section of radius bisects first cubital cell as in *Paratiphia*. Dorsal propodeum with areola when present, slenderly rectangular and about 6 times as long as wide; area beside areola coarsely punctate. Tergum 1 with anterior transverse carina interrupted on center line; preapical band medially a single row of coarse punctures. Sternum 2 with a conspicuous anterior median callosity. Intermediate terga with a line of contiguous punctures at some distance from apices of terga. Pygidium with a few small round punctures on anterior half. Length 16 to 18 mm.

MALE.—Body black with broad yellowish white

spots approximately as in female. Front with an impunctate ridge parallel to inner eye orbit. Cheek slightly wider than an antennal fossa. Mandible with massive preapical denticle. Dorsal pronotum with low transverse carina, not buttressed. Lateral pronotum coarsely punctate on upper anterior part. Legs, except inner face of fore tibia, black. Tegula roughly rectangular, 1.7 times as long as wide, completely but very minutely shagreened. Forewing with backward directed spur from first section of radius almost bisecting first cubital cell; apical enclosure on radial cell directed strongly inward to costal margin. Dorsal propodeum outside areola closely and very coarsely punctate; areola a small, elongate oval, without median carina. Lateral propodeum without a well-defined upper rugulose region. Tergum 1 with a poorly defined anterior transverse carina interrupted medially. Terga 1 to 6 each with a broad, ribbon-like impunctate apex bordered anteriorly by a row of coalesced punctures. Sternum 2 with a strong anteromedian callosity. Sterna each with a strong median escarpment extending from side to side. Sternum 6 without specialized median plate. Male genitalia (Allen 1966: 209) have a heavy sclerotized paramere which serves to box in the remainder of the genitalia, the parameral plate has 2 twisted, finger-like terminal lobes, the cuspis is short and pointed, another small structure posteroventrad to cuspis is tipped with several long hairs.

1 ♂; French Guiana (Guerin) (MHNP). 1 ♂; Santerem, presumably Brazil. 1 ♂; probably "Colonia Hansa," Brazil (CU). 1 ♂; Ichilo, Buena Vida, Bolivia (Martinez) (USNM). 1 ♀; Tingo Maria, Huanuco, Peru (AMNH). 1 ♀; Palmar, Ecuador (AMNH). 1 ♂; Panama (BM).

Genus *Mallochia*, new genus

This genus is named in honor of J. R. Malloch, who, in 1918, published the first systematic paper on Tiphinae in which numerous valuable diagnostic characters were used. Because of its peculiar elongated mouthparts, it seems impossible to consider the designated genotype in any light other than generically separate from but a close relative of the North American genera *Neotiphia* and *Paratiphia*, which also have specialized elongated mouthparts. In most other respects, however, it appears much more closely related to the genus *Tiphia*. Both sexes are of moderate size; neither has broad white spots on any part of the body.

It is tempting to presume that this genotype lies closer to the origins of the highly specialized genera *Paratiphia* and *Neotiphia* than to any species yet discovered. Although the males of the 2 described species have lateral denticles on the fifth sternum, this may not be a universal generic character.

GENOTYPE.—♂; holotype of *M. arnau*.

MALE.—Head with elongated labium and maxillae. The labium with small palpi (Figure 1). Prepectal carina present on mesopleuron. Hind coxa without prominent carina between inner and upper faces. Forewing with terminal veins of second cubital and radial cells almost a straight line and sloped strongly inward to costal margin; first section of radial cell without a bend or inwardly directed spur; first recurrent vein not recurved just before junction with cubitus. Dorsal propodeum with only one transverse carina. Lateral propodeum with a distinct separation between upper rugose and lower shagreened sections. Tergum 1 without anterior transverse carina and without depressed sensorial area on sides. Intermediate terga without an escarpment or groove near junction with preceding tergum, or broad, polished ribbon-like bands at the apices. Pygidium not coarsely punctate and without carinae enclosing the punctate part. Sternum 6 medially without a specialized shield-shaped area; its lateral margin not notched.

FEMALE.—Mouthparts elongated, with small palpi as in male. Scutum with anteromedian escarpment. Mesopleuron with a prepectal ridge. Forewing with radial cell open, the radius with a terminal spur directed mesad toward costal margin. Pygidium as in *Tiphia* with punctures on basal part and apex smooth. In other characters as described for male.

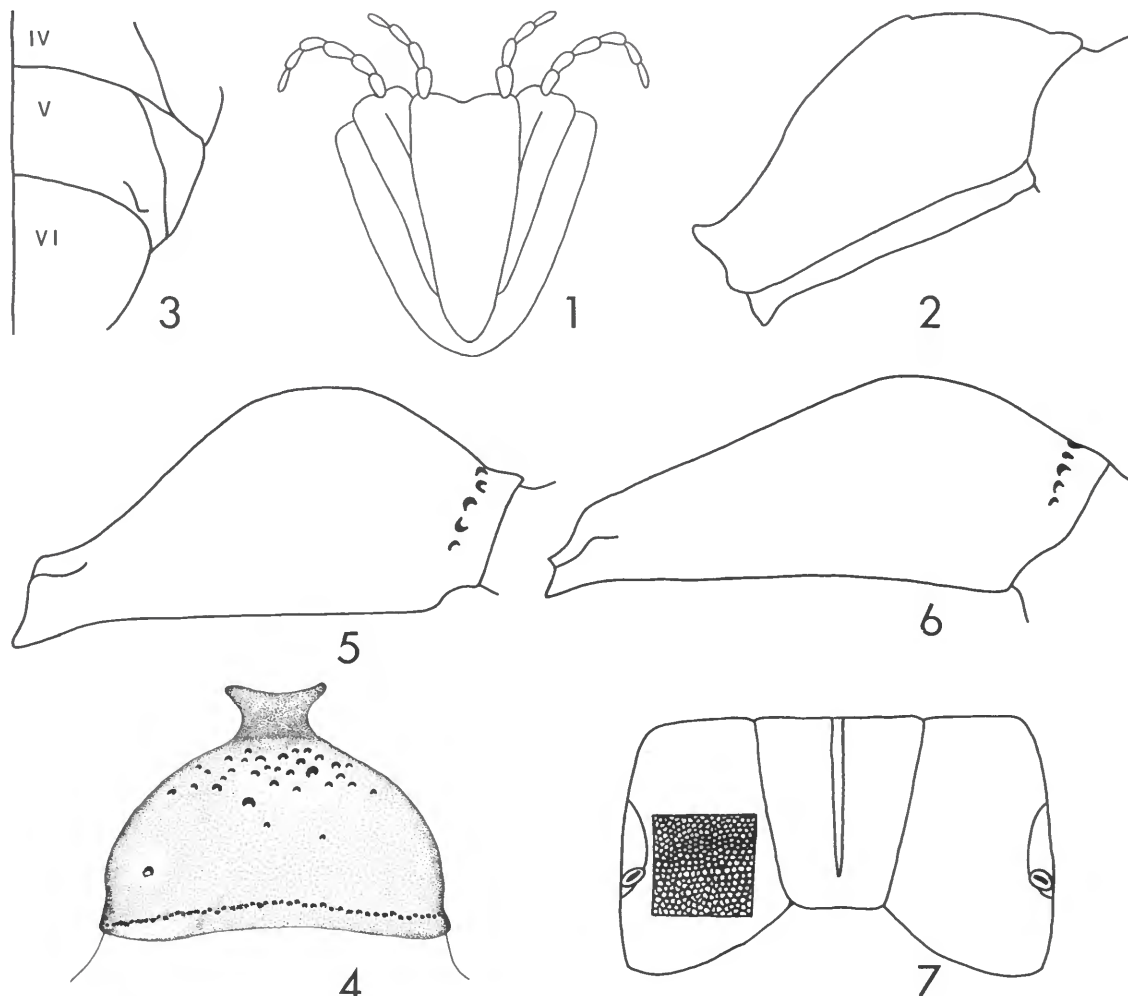
2. *Mallochia arnau*, new species

FIGURES 1, 2, 3, 43

Known only from the holotype and 1 paratype. The paratype, collected at a locality in Tucuman away from the type locality and a year later than the holotype, has somewhat coarser abdominal punctures. In this species the outline of the tegula, the sculpturing of the dorsal propodeum and the size of the punctures of the abdominal terga are distinctly different from *M. colalao*.

HOLOTYPE.—♂; San Pedro de Colalao, Tucuman, Argentina, 9-II-1947 (J. M. Arnau) (CDA).

Front with moderate-sized punctures largely of first-



FIGURES 1-7.—Male of *Mallochi arnau*, new species, from San Pedro de Colalao, Tucuman, Argentina: 1, mouthparts; 2, lateral aspect of tergum 1; 3, sternal area showing lateral denticle on sternum 5. 4, tergum 1 of male of *Tiphia osborni*, new species from Caracas, Venezuela. 5, tergum 1 of male, *Tiphia ripaliwinae*, new species, from "Ripaliwini," South Surinam. 6, tergum 1 of male, *Tiphia narinensis*, new species from near La Union, Colombia. 7, dorsal propodeum of male, *Tiphia boxi*, new species, from Caracas, Venezuela, showing detail of fish-scale-like shagreening.

degree density to near level of lowest ocellus, interspersed with secondaries that are about as numerous as the primaries. Antennal flagellum 1.5 times as long as head width. Head width 2.0 times least distance between eyes. (2 measured were 2.0, 2.1). Clypeus with its median extension broadly arcuate to near base

and without trace of lateral carina or lateral pit. Mandible without preapical denticle. Mouthparts (Figure 1) elongate.

Dorsal pronotum with a barely perceptible transverse carina; without bordering sulcus. Lateral pronotum with anterior process uniformly low; without

groove or escarpment across its disc. Mesopleuron on anterior slope with moderate-sized primary punctures largely of second-degree density and minute secondaries which are considerably more numerous than the primaries. Legs black. Hind tibia on inner face without sharp long carina; sensorium pyriform, relatively large and in a slight depression. Tegula thickened, polished, slightly longer than broad. Forewing (Figure 43) with second cubital cell greatly exceeding radial cell in lateral extension and about equal to radial cell in area.

Dorsal propodeum with lateral disc coarsely reticulate near areola, elsewhere roughly shagreened; areola strongly tapered with sigmoid sides, length at least twice apical width; transverse apical carina obsolete except at apex of areola and for short distance on either side. Tergum 1 (Figure 2) without anterior transverse carina; preapical band bordered anteriorly by an irregular escarpment, and consisting of a single row of punctures irregularly spaced and aligned. Intermediate terga with moderate-sized punctures not varying greatly in size or distribution; vestiture of fine, sparse hairs. Pygidium without lateral carina enclosing punctate part. Sternum 5 (Figure 3) with a small, appressed lateral denticle.

Length 7.3 to 8.6 mm.

FEMALE.—Unknown.

PARATYPE.—1; Trancas, Tucuman, Argentina, 9-II-1948. (J. M. Arnau) (CDA).

3. *Mallochia alini*, new species

Except for the elongated mouthparts, this species appears to have no characters in the female sex that separate it from the genus *Tiphia*.

HOLOTYPE.—Sao Paulo, Sao Paulo, Brazil, 12-I-1964 (V. N. Alin) (AMNH).

FEMALE.—Front broadly bipunctate with punctures of upper half chiefly of second- and third-degree density, but without interspaces as wide as an ocellus. Antennal flagellum short, stout, with first 3 segments 2.3 times as long as greatest width. Mandible without preapical denticle.

Dorsal pronotum without transverse carina; punctures chiefly of third-degree density except in band terminating punctate part. Lateral pronotum aciculate but not rugulose in ventral angle; without groove across disc. Mesopleuron on outer disc with coarse primary punctures largely of second-degree density; subalar patch of dense micropunctures as wide as tegula

but not continued ventrally along prepectal ridge. Legs, except tarsi, black. Hind tibia angular in cross section; sensorium slightly depressed, a third as wide as joint and about 2 times as long as wide. Hind basitarsus not grooved. Tegula not shagreened and without groove on outer margin. Forewing slightly infuscate; stigma separated by less than its length from basal vein; radial cell nearly closed by spur arising before its apex and directed strongly mesad toward costal margin.

Dorsal propodeum outside areola broadly bipunctate; areola with concave sides, its length more than 3 times and its base about one and one-eighth apical width. Lateral propodeum with rugulae coarse and widely spaced; lower part with sparse, inconspicuous microsetae. Tergum 1 moderately punctate on dorsal area; prepectal band with a somewhat rounded escarpment on anterior border and a single impressed row of moderate-sized punctures, separated by more than their average diameter. Intermediate terga with exceptionally coarse, deep punctures, some of which are perceptibly dimpled; apices of each with a conspicuous row of coarse punctures, narrowly aligned and each bearing a long bristle. Pygidium coarsely punctate on basal two-thirds, punctures terminating in a straight transverse line; impunctate part coarsely shagreened to apex.

Length 8.8 mm.

MALE.—Unknown.

HOLOTYPE.—1; Curitiba, Parana, Brazil, 14-XII-1955 (Michener and Lange) (UK).

4. *Mallochia colalao*, new species

Known only from holotype specimen. *M. colalao* has much coarser abdominal punctures than *M. arnau*, the tegula has a more conspicuous medio-caudal extension and the transverse carina of the dorsal propodeum is continued to the lateral corner and is bordered by a regular series of rectangular pits. It is possible that *alini*, a female described from Brazil which has similar abdominal punctation, may be conspecific with *colalao*.

HOLOTYPE.—♂; San Pedro de Colalao, Tucuman, Argentina, 9-II-1947 (J. M. Arnau) (CDA).

MALE.—Front on lower half and along eyes with contiguous punctures, on upper half generally of second-degree without interspaces as wide as an ocellus; secondaries numerous on lower half. Head width 2.2 times least distance between eyes. Cheek as wide

as antennal fossa. Clypeus without lateral carina or lateral pit. Mandible without preapical denticle.

Lateral pronotum with low, complete transverse carina not bordered by sulcus; punctures coarse, of uniform size and first-degree density. Lateral pronotum broadly aciculate, free of coarse sculpturing. Scutum without anteromedian escarpment; coarse punctures uniformly distributed in area between notaulices. Mesopleuron on anterior slope with coarse punctures generally of first-degree density mixed with minute secondaries that are everywhere much more numerous than the primaries. Legs black. Hind tibia with strong ridge on inner face, expanded to enclose lanceolate sensorium one-fifth width of joint and about 3 times as long as wide. Tegula much longer than wide, with a conspicuous angular extension of inner part; a posterior marginal groove terminating before outer apical angle. Forewing with membrane slightly infumate,

second cubital cell equaling or exceeding radial cell in area.

Dorsal propodeum outside areola irregularly rugose punctate, fading to shagreening; areola strongly tapered, its length two and one-half times and its base one and three-fourths times apex; transverse apical carina complete, bordered by uniform series of rectangular pits. Tergum 1 with numerous very coarse punctures on dorsal area, and a broad dispersion of extremely minute, widely separated punctures. Preapical band a deep, narrow trench in which the punctures are not clearly defined. Terga with a nearly uniform distribution of punctures of about the same size; terga 3, 4, and 5 each with terminal punctures in a well-defined row. Sternum 5 with a small, appressed lateral denticle.

Length 8.4 mm.

FEMALE.—Unknown.

Genus *Tiphia* Fabricius Countries North of Brazil

Key to Males: Countries North of Brazil

- | | |
|--|---|
| 1. Tergum 1 without transverse carina | 2 |
| Tergum 1 with transverse carina | 9 |
| 2. Radial cell greatly exceeding second cubital cell in lateral extension | 3 |
| Radial cell at most only slightly exceeding second cubital cell in lateral extension | 5 |
| 3. Tergum 3 with conspicuous enlarged, dimpled punctures | 5. <i>Tiphia osborni</i> , new species |
| Abdominal terga without enlarged, dimpled punctures | 4 |
| 4. First abdominal tergum short, not longer than greatest width; intermediate terga with moderately coarse punctures | 6. <i>T. ripaliwiniae</i> , new species |
| First abdominal tergum elongated, 1.4 or more times as long as wide | 7. <i>T. narinensis</i> , new species |
| 5. Radial cell terminating in a sector which is sloped strongly inward to coastal margin | 8. <i>T. paupi</i> Allen and Krombein |
| Radial cell if exceeded by cubital cell, not sloped inward without a sharp bend to coastal margin | 6 |
| 6. Tegula with a fine groove about outer apical angle | 7 |
| Tegula without groove about outer margin | 8 |
| 7. Tegula with outer and posterior margins roundly right-angular | 9. <i>T. geijskesi</i> , new species |
| Tegula with margins orbicular | 10. <i>T. boxi</i> , new species |
| 8. Terga 3 to 5 at line of articulation with preceding terga abruptly raised above level of remainder of tergum | 11. <i>T. savanna</i> , new species |
| Terga 3 to 5 without anterior transverse escarpments | 12. <i>T. intermedia</i> Malloch |
| 9. Sternum 5 with lateral denticles | 10 |
| Sternum 5 without lateral denticles | 11 |
| 10. Sterna 3, 4 and 5 each with lateral, inverted U-shaped escarpment | 13 |
| Sterna without inverted U-shaped escarpments; wings black | 13. <i>T. insueta</i> , new species |
| Sterna with inverted U-shaped escarpments | 14. <i>T. rossi</i> , new species |
| 11. Terga 3 and 4 with high escarpment encircling anterior part | 12 |
| Terga 3 and 4 without encircling anterior escarpment | 13 |

12. Front and mesopleuron with numerous minute punctures 11. *T. savanna*, new species
 Front and mesopleuron almost without micropunctures 15. *T. bogota*, new species
13. Legs bright red; transverse carina of dorsal pronotum with exceptionally long, strong but-tressing ridges, medially with only scattered punctures posterior to ridges
 16. *T. ramara*, new species
- Legs black; dorsal pronotum with transverse carina with short, weak ridges, the following punctate area broad with numerous punctures 17. *T. pacoza* Allen

Key to Females: Countries North of Brazil

1. Body completely and uniformly dark blue or green 2
 Body black 4
2. Tegula almost twice as long as wide; upper front with exceptionally large punctures 18. *T. vandervechti*, new species
 Tegula as long as wide; frontal punctures of normal size 3
3. Tergum 1 with anterior transverse carina 19. *T. caerulea*, new species
 Tergum 1 without anterior transverse carina 20. *T. colombiana*, new species
4. Hind basitarsus grooved 5
 Hind basitarsus not grooved 8
5. Scutum without an anteromedian escarpment 21. *T. huallaga*, new species
 Scutum with an anteromedian escarpment 6
6. Tergum 3 and to lesser extent tergum 4 with a low escarpment at junction with preceding segment, more strongly developed at sides 11. *T. savanna*, new species
 Terga of abdomen without escarpments near junction with preceding terga 7
7. Lateral pronotum with narrow, linear groove across disc; hind tibia without carina on inner face, upper margin conspicuously arched 9. *T. geijskesi*, new species
 Lateral pronotum without groove across disc; hind tibia usually with carina on inner face, upper margin not arches 22. *T. wosuna*, new species
8. Posterior propodeum with a narrow, complete carina; radial cell more than 4 times as long as wide 23. *T. oblonga* Smith
 Posterior propodeum without carina; tegula without shagreening; radial cell less than 4 times as long as wide 9
9. Tergum 1 with transverse carina 10
 Tergum 1 without transverse carina 11
10. Anterior part of lateral propodeum with fine, closely spaced rugulae; lateral pronotum without sharply defined groove across its disc; intermediate terga without anterior encircling escarpments 24. *T. silvae*, new species
 Anterior part of lateral propodeum with coarse, widely spaced rugulae; disc of lateral pronotum with short but sharply defined groove; intermediate terga with anterior encircling escarpments often concealed under preceding terga 25. *T. surinam*, new species
11. Preapical band of tergum 1 without bordering escarpment 26. *T. aguacatal*, new species
 Preapical band of tergum 1 bordered anteriorly by an escarpment 12
12. Legs reddish and very stout; hind femur less than 2 times as long as wide
 27. *T. bartica*, new species
 Legs black, not unusually stout; hind femur 2 times as long as wide
 28. *T. phedra*, new species

5. *Tiphia (Tiphia) osborni*, new species

FIGURE 4

Tiphia osborni is represented only by the holotype male. It belongs to the group of species, common in South America, in which some of the tergal punctures are much enlarged and dimpled. It differs from others in this group in having a clearly defined row of much enlarged punctures undulating transversely over ter-

gum 3. Other distinguishing features are: the absence of conspicuous buttresses to the pronotal transverse carina; absence of transverse carina on tergum 1, or on the discs of the intermediate terga, or sternal nectics; and the presence of an elongate radial cell.

HOLOTYPE.—♂; Caracas, Venezuela, October 1929 (H. T. Osborn) (USNM).

MALE.—Front with small primary punctures of first-degree density on lower half and narrowly near eye,

in middle of upper half of third-degree without interspaces as wide as an ocellus; dense secondaries extending to above lower half. Head width 2.2 times least distance between eyes. Cheek slightly narrower than an antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with high, sharp-crested transverse carina; bordering sulcus without cross ridges; punctures ranging in size from minute to moderately large, separated by distances much greater than their average diameter. Lateral pronotum with faintly defined escarpment across middle disc. Mesopleuron on anterior slope with primary punctures small and separated in most directions by several times their average diameter; secondaries are minute and slightly more numerous than primaries. Legs black. Hind tibia with a strong carina extending almost to friction plate. Tegula not shagreened and without marginal grooves. Forewing with hyaline membrane; radial cell greatly exceeding second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10: 21: 14: 19.

Dorsal propodeum with lateral discs free of conspicuous sculpturing; areola with slightly sigmoid sides, slightly convergent, about one and one-half times as long as apical width. Tergum 1 (Figure 4) not elongate; without transverse carina; preapical band a single row of very small punctures, not impressed. Terga 2, 3, 4, and 5 dominated by transverse series of greatly enlarged dimpled punctures, those on tergum 3 in a single wavy row across middle. Sternum 5 without lateral denticles.

Length 8.5 mm.

FEMALE.—Unknown.

6. *Tiphia (Tiphia) ripaliwinae*, new species

FIGURE 5

T. ripaliwinae belongs to a small group of common-place species described from the male in which the first tergum does not have a transverse carina and is not abnormally elongate, the intermediate terga do not have greatly enlarged and dimpled punctures. It runs in the key to the couplet with *narinensis* which has an elongated first tergum. It has been described from the type and one paratype collected on the same date at "Ripaliwini," Surinam.

HOLOTYPE.—♂; "Ripaliwini," South Surinam, 9-VI-1962 (P. H. Doesburg, Jr.) (RNH).

MALE.—Front with punctures on lower third of first-degree density, with several interspaces on upper front wider than an ocellus; secondaries confined to lower third. Head width 2.3 times as great as least distance between eyes (2 measured were 2.3, 2.3). Cheek narrower than antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with a sharp, high, transverse carina, its bordering sulcus with only short, obscure cross ridges near humeral angle; punctures of moderate size but sparse and generally separated by much more than their average diameter. Lateral pronotum with a short crescent-shaped groove on disc. Mesopleuron on a broad outer area with punctures very small and separated by several times their average diameter, without secondaries; subtegular patch of dense microsetae not quite as wide as tegula. Legs black except fore tarsi and inside face of fore tibia. Inner face of hind tibia with long, sharp carina. Tegula glossy, without groove on outer margin; forewing slightly infumate, radial cell greatly exceeding second cubital cell in lateral extension. Sectors of second cubital cell in terms of inner sector (itob) are 10: 25: 19: 14 (mean of 2).

Dorsal propodeum with its lateral discs relatively smooth and polished; areola with concave and convergent sides, less than 2 times as long as apical width, median carina linear and complete. Tergum 1 (Figure 5) without anterior transverse carina; not longer than wide, dorsum with numerous widely separated punctures, preapical band a single row of coarse, shallow, contiguous punctures slightly impressed and separated from apex by scarcely more than an average puncture diameter. Terga not shagreened; punctures of more than average size, and on terga 3, 4, 5, and 6 uniformly distributed and generally of first-degree density. Sternum 5 without lateral denticle.

Length 5.2 to 5.8 mm.

FEMALE.—Unknown.

PARATYPE.—1; same data as holotype (RNH).

7. *Tiphia (Tiphia) narinensis*, new species

FIGURE 6

T. narinensis has been described from the holotype and 2 paratype males taken at the same date and locality in southern Colombia. It runs in the key to the same couplet with *T. ripaliwinae* to which it seems to be related. However, *T. narinensis* has a much elongated first tergum, and much finer punctures on the

intermediate terga, with broadly shagreened areas on the abdomen not present on *T. ripaliwiniae*.

HOLOTYPE.—♂; 15 miles south of La Union, Narina, Colombia, 2,150 m, 4-III-1955 (E. I. Schlinger and E. S. Ross) (CAS).

MALE.—Front with punctures of first-degree density on lower third and bordering eyes but much more widely separated in middle of upper front where there are several interspaces as wide as an ocellus. Head width 2.2 times least distance between eyes. Cheek narrower than an antennal fossa. Mandible without denticle.

Dorsal pronotum with a sharp-crested transverse carina bordered by a narrow and sometimes an obscurely irregular scalariform sulcus; punctures unusually small, generally separated by three or more times their average diameter. Side of pronotum dished but without well-defined escarpment across its disc. Mesopleuron on anterior slope glossy with sparse, very primary punctures separated nearly everywhere by several times their average diameter, with sparse minute secondaries on upper part. Inner face of fore tibia bright orange. Hind tibia usually with narrow ridge extending almost to friction plate. Tegula not shagreened and without groove on outer margin. Forewing with radial cell greatly exceeding second cubital cell in lateral extension. Sectors of second cubital cell in terms of inner sector (itob) are 10:31:20:23 (average of 3).

Dorsal propodeum devoid of strong sculpturing; areola rectangular to slightly tapered, at least twice as long as apical width; lateral propodeum on lower part entirely coarsely shagreened. Tergum 1 (Figure 6) unusually elongate, more than 1.4 times as long as wide; without transverse carina; preapical band not impressed, consisting of coarse punctures more or less coalesced and 1 to 2 punctures wide. Terga with punctures exceptionally fine, sparse, and separated by much more than their average diameter; tergum 6 shagreened. Sternum 5 without lateral denticle.

Length 5.7 to 7.3 mm.

FEMALE.—Unknown.

PARATYPES.—2; same data as holotype.

8. *Tiphia (Tiphia) paupi* Allen and Krombein

FIGURE 44

Tiphia paupi Allen and Krombein, 1961:62.—Allen 1970: 263.

A single specimen in the California Academy of Sciences taken 17 miles west of Sevilla, Colombia, 7-III-1955 by E. I. Schlinger and E. S. Ross appears definitely conspecific with the type specimen from Haiti. The unusual character of the species is the presence of a very short radial cell, the apex of which slopes strongly inward toward the costal margin. This species is coupled in the key with *T. rossi*, an entirely unrelated species. The descriptive notes below are taken principally from the original description.

HOLOTYPE.—♂; Port au Prince, Haiti, 21-XI-1927 (USNM).

MALE.—Front, except for a median vitta, with coarse, contiguous primary punctures to near level of lowest ocellus; upper half without many secondaries. Cheek scarcely masked with its vestiture of short hairs; slightly wider than antennal fossa. Mandibles without preapical cusp.

Dorsal pronotum with its carina complete and moderately high. Lateral pronotum when viewed from in front with a poorly defined groove on its disc. Mesopleuron on its outer disc with primary punctures of third-degree density, and secondaries slightly more numerous than primaries. Legs black. Hind tibia with a prominent naked carina extending entire length of inner face. Hind basitarsus with microscopic longitudinal ridge on basal half of inner face. Tegula not shagreened, without groove on outer margin. Radial cell of forewing (Figure 44) in lateral extension much exceeded by second cubital cell, its apex directed strongly inward toward costal margin.

First tergum without trace of anterior transverse carina; preapical band a single straight row of punctures moderately impressed. Second sternum without trace of an anteromedian callosity. Fifth sternum without lateral denticle.

Length 7 mm.

FEMALE.—Unknown.

9. *Tiphia (Tiphia) geijskesi*, new species

This is one of the few species described from South America in which a satisfactory series of both sexes is available. The females were all taken in a Malaise trap at the same locality as the males and there is some resemblance in structure, particularly the tegula and the lateral pronotum. This species closely resembles *T. veracruzae* from Mexico. However, the antennal flagellum of the male is somewhat longer (in

T. veracruzae the range is from 0.99 to 1.14 times the head width), and the propodeal areola of the female is usually more slender with its middle carina only moderately expanded or linear. The fine rugulae on the apical half of the female pygidium, also found in *T. veracruzae*, is unusual in American species of *Tiphia*. The female differs from *T. wosana*, in which there is no narrow groove on the lateral pronotum, and the upper border of the hind tibia is not arched.

HOLOTYPE.—♂; "Zanderij Savanna," Surinam, Malaise trap, 27/30-VII-1964 (D. C. Geijskes) (RNH).

MALE.—Front with punctures of first-degree density except on an upper median area about as large as ocellar triangle; secondaries, confined to lower half. Antennal flagellum 1.23 times as long as head width (3 measured were 1.25, 1.24, 1.20). Head width 2.0 times least distance between eyes (5 measured were 1.9, 2.0, 2.0, 2.0, 2.0). Cheek wider than antennal fossa. Mandible without preapical denticle.

Dorsum of pronotum with complete, sharp-crested transverse carina; bordering sulcus with only a few obscure cross ridges at humeral angle. Lateral pronotum with anterior process sharp-crested to ventral angle; a conspicuous groove across middle disc. Mesopleuron on outer disc with small primary punctures separated in most directions by more than their average diameters; minute interspersed secondaries abundant on upper half; subtegular area with patch of dense microsetae as wide as tegula. Legs, except fore and mid tarsi and inside of fore tibia black. Hind tibia sometimes moderately ridged on inner face, with an elongate linear sensorium about half as long as joint. Tegula with outer and posterior margins roundly right-angled with a fine marginal groove about outer apical angle. Forewing with radial cell equal to second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:20:16:20.

Dorsal propodeum with area outside areola chiefly very faintly shagreened; areola keystone-shaped usually one-fourth longer than basal width and one and one-half times apical width, median carina usually reduced to knob or short triangle. Tergum 1 without anterior transverse carina; preapical band a single irregular row of slightly impressed punctures most of which are separated by less than their average diameter, band separated from apex by about 4 times diameter of largest punctures. Intermediate terga

with moderate-sized punctures, relatively uniform in size and distribution. Sternum 5 without lateral denticle.

Length 6.5 to 8.5 mm.

ALLOTYPE.—♀; same locality as holotype, Malaise trap, 10/13-VIII-1964 (D. C. Geijskes) (RNH).

FEMALE.—Coarse primary punctures of first- or second-degree density over entire front to level of lowest ocellus except for a narrow median vitta. Mandible uniformly tapered to a sharp point.

Dorsal pronotum with a weakly developed transverse carina usually interrupted at middle; punctate part with coarse primaries rather uniformly distributed and of first-degree density except on lateral discal areas. Lateral pronotum free of coarse sculpturing except for small punctures bordering anterior process, and a narrow, linear groove across middle disc. Mesopleuron on outer disc with numerous coarse primary punctures largely of first- or second-degree density and a very few coarse secondaries; subtegular area with patch of microsetae much wider than tegula. Scutum with anteromedian escarpment and notauli usually connected. Legs black except middle and hind tibiae which are faintly rufous. Hind tibia with sensorium flush with surrounding area; inner face not carinate, or angular in cross section, upper margin strongly arched. Hind basitarsus with deep groove scarcely longer than apical width of joint. Tegula with outer and posterior borders roundly right-angled; with a fine marginal groove about apical angle; without shagreening. Forewing only slightly infuscate; radius without spur either on its first section or at its terminus; stigma slender, separated by not more than its length from basal vein.

Dorsal propodeum obscurely shagreened with sparse, faint minute punctures; areola slightly convergent apically, more abruptly so near base, about two and one-half times as long as apical width. Lateral propodeum on upper part with rugulae rather fine but not numerous or closely spaced, often obsolescent on caudal third; lower part with almost no microsetae. Tergum 1 without anterior transverse carina; preapical band not impressed, consisting of an irregular series about two punctures wide. Intermediate terga without encircling escarpments; with punctures relatively uniform in size and distribution except for small, nearly impunctate areas on terga 3 and 4. Pygidium with rugose punctate part of basal three-

fifths continued apically to near tip as fine, close rugulae.

Length 8.2 to 11.3 mm.

PARATYPES. — 41 ♂♂, 8 ♀♀, at same locality as holotype, at different dates, mid-July to early September 1964, Malaise trap (D. C. Geijskes) (RNH). 1 ♂; same locality as holotype, 22-XI-1964 (D. C. Geijskes) (RNH). 1 ♂; Valencia, Venezuela, November 1929 (H. T. Osborn) (USNM). 1 ♂; Caracas, Venezuela, No. 6127 (S. Moritz) (ZMB). 1 ♂; Colombia No. 6128 (Moritz) (ZMB).

10. *Tiphia (Tiphia) boxi*, new species

FIGURES 7, 45

T. boxi belongs to a small group in which the males have such undistinguished characters as the first tergum without an anterior transverse carina, a radial cell at most only slightly exceeded by the second cubital cell, the absence of a lateral denticle on the fifth sternum and an orbicular tegula. It does have a groove on the outer margin of the tegula which brings it in the key to the same couplet as *T. geijskesi*, but the shape of the tegula differs. This species is known only from the holotype and one paratype taken at the same locality.

HOLOTYPE. — ♂; La Vega, near Caracas, Venezuela, 27-I-1927 (H. E. Box) (USNM).

MALE.—Front with primary punctures of first-degree density except for a narrow interspace on median line and another interspace below lowest ocellus, numerous secondaries on lower half. Head width 1.9 times least distance between eyes. (2 measured were 1.9, 2.0). Cheek wider than antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with a high transverse carina conspicuously buttressed its entire length with short cross ridges; punctures in most areas of punctate part of moderate size and of first-degree density. Lateral pronotum with an obscure crescent-shaped escarpment. Mesopleuron on anterior slope broadly bipunctate with secondaries large and more numerous than primaries. Inner face of fore tibia and much of tarsal surface yellowish. Hind tibia with a broad naked stripe on inner face, within which (under high power) sensorium is visible as a threadlike streak. Tegula orbicular, not shagreened; with a fine groove about outer apical angle. Forewing (Figure 45) with hyaline membrane; radial cell short and equal to or

only slightly exceeding second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:24:17:24.

Dorsal propodeum (Figure 7) on its discs with a broad area of fine reticulum resembling fish scales; areola keystone-shaped, about one and one-half times as long as apical width, median carina a raised triangle on basal third. Tergum 1 without anterior transverse carina; preapical band a single row of coarse, closely adjacent punctures, not impressed. Intermediate terga with sparse, median-sized punctures exceptionally uniform in size and distribution. Sternum 5 without lateral denticle.

Length 5.8 to 6.1 mm.

FEMALE. — Unknown.

PARATYPE. — 1; same data as holotype except collected on 28-I-1927 (USNM).

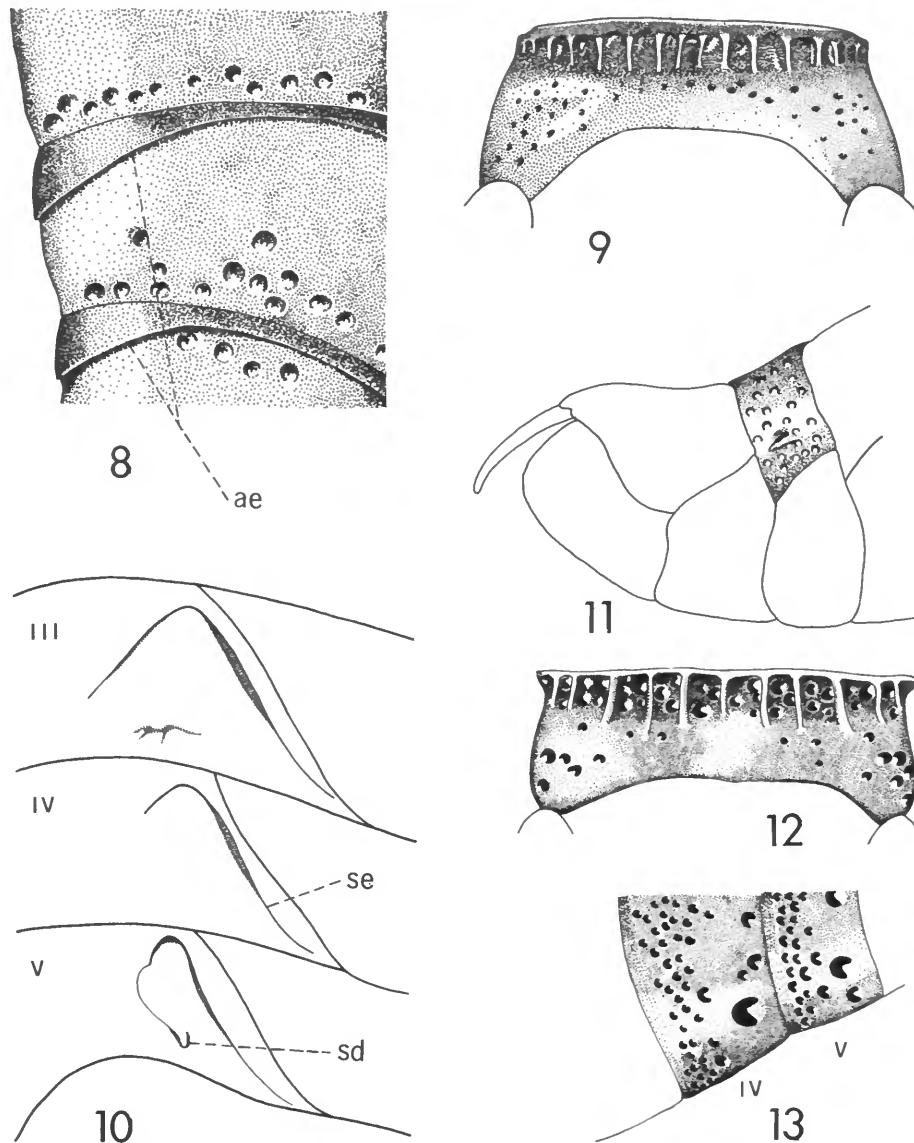
11. *Tiphia (Tiphia) savanna*, new species

FIGURE 8

This species is characterized by the unusual feature of encircling escarpments on the anterior part of the intermediate terga, which in the male are so much elevated that they serve to lift conspicuously the apices of the preceding segments. This character also occurs in *T. insueta*, and in *T. vincenta* from Southern Brazil, but unlike the latter two, the male of *T. savanna* has no lateral U-shaped escarpments nor lateral denticles on the sterna. In the female the transverse escarpment of the intermediate terga are present only as a slight incision which may be completely concealed when the segments are telescoped. The female does not deviate in any significant way from other species of *Tiphia*, hence I see no valid reason to consider the species a representative of a new genus. All the specimens enumerated are from Surinam, and all but one from the collection of the Rijksmuseum. Paratypes have been deposited at the United States National Museum and the Academy of Natural Sciences of Philadelphia.

HOLOTYPE. — ♂; "Zanderij Savanne," 27/30-VII-1964, Malaise trap (D. C. Geijskes).

MALE. — Front with punctures on upper third of second- and third-degree density with numerous interspersed minutes. Head width 2.3 times least distance between eyes (five measured were 2.3, 2.3, 2.3, 2.4, 2.1). Cheek narrower than antennal fossa. Eye frequently mottled, sometimes faintly iridescent. Mandible without preapical cusp.



FIGURES 8-13.—8, Male of *Tiphia savanna*, new species, from "Zanderij Savanne," Surinam, showing elevated anterior escarpments of intermediate sterna. 9-10, male of *Tiphia insueta*, new species, from Paramaribo, Surinam: 9, dorsal pronotum; 10, section of sternal area showing U-shaped escarpments and lateral denticle. 11, male of *Tiphia rossi*, new species, from near Fresno, Tolima, Colombia, showing denticle on sternum 5. 12-13, male of *Tiphia ramara*, new species, from Paramaribo, Surinam: 12, dorsal pronotum showing heavily buttressed transverse carina; 13, section of intermediate terga. (*ae*=anterior escarpment, *sd*=sternal denticle, *se*=sternal escarpment.)

Dorsal pronotum with strong, complete transverse carina; bordering sulcus free of cross ridges. Side of pronotum usually with weak rugulae in ventral corner and sometimes a poorly defined escarpment across its middle disc. Mesopleuron on outer disc with moderate-sized primary punctures of third-degree density and with minute secondaries more numerous than primaries; subtegular patch of dense microsetae as wide as tegula. Legs except tarsi usually black. Hind tibia with ridge on inner face complete to friction plate, sensorium oval or short clavate. Tegula without groove on outer margin. Forewing with radial cell slightly exceeding cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:29:20:27 (mean of 2).

Dorsal propodeum outside areola only faintly sculptured; areola strongly tapered, its length slightly exceeding basal width but about one and one-half times apical width, median carina triangular. Tergum 1 usually with a weak transverse carina; dorsal area almost devoid of punctures; preapical band a single irregular row of impressed punctures most of which are separated from each other by less than, and from apex by slightly more than, their average diameter. Intermediate terga (Figure 8) largely polished impunctate with several greatly enlarged punctures near apices; anterior part at point of articulation with preceding segment conspicuously elevated by an escarpment. Sterna laterally without inverted U-shaped escarpments. Fifth sternum without lateral denticle.

Length 5.2 to 8.2 mm.

ALLOTYPE.—♀; "Zanderij Savanne," 2/6-VIII-1964, Malaise trap (D. C. Geijskes).

FEMALE.—Front with deep, coarse punctures, on upper one-third largely of second-degree density and of varying sizes without interspaces wider than an ocellus. Mandible smoothly tapered without preapical denticle.

Dorsal pronotum with a low, irregular carina sometimes complete over middle section. Lateral pronotum with conspicuous rugulae in ventral corner bordered above by prominent discal escarpment. Mesopleuron on outer disc with medium-sized punctures of third-degree density interspersed with about an equal number of very large secondaries; subtegular patch of dense microsetae wider than tegula and terminating abruptly above prepectal angle. Scutum with antero-median escarpment not connected with notaulices. Legs black. Hind femur of above average stoutness.

Hind tibia in cross section slightly angulate on inner face, with upper margin not strongly arched. Hind basitarsus grooved. Tegula broadly and conspicuously shagreened; without groove on outer margin. Forewing with stigma separated by at least its length from basal vein; radius without backward directed spur on first section, or terminal spur.

Dorsal propodeum without conspicuous sculpturing; areola nearly rectangular, about two and one-half times as long as wide. Lateral propodeum on upper part with many rugulae, very closely spaced; on lower part with dense, brushlike micropile confined to narrow border of metacoxal cavity. Tergum 1 without anterior transverse carina. Terga 3 and 4 broadly polished impunctate anteriorly, with a band of coarse punctures widely separated from posterior border; with a faint escarpment encircling anterior part. Pygidium closely elongate puncture on basal half; impunctate half wrinkled and faintly shagreened to near apex.

Length 9 to 12 mm.

PARATYPES.—15 ♂♂; "Zanderij Savanne," 21-VII to 16-VIII-1964, Malaise trap (D. C. Geijskes) (RNH). 2 ♂♂; Paramaribo, "Fernandes Rd.," 28-VII-1963 (D. C. Geijskes) (RNH). 2 ♂♂; Paramaribo, "Charlesburg," 10/21-I-1964, Malaise trap (D. C. Geijskes) (RNH). 1 ♂; Paramaribo, "Blauwgrond," 27-IV-1963, on *Belicocca bijuga* (J. v.d. Vecht) (RNH). 1 ♂; Paramaribo, "Cultuurtuin," 28-VII-1963 (J. v.d. Vecht) (RNH). 1 ♀; Paramaribo, "Cultuurtuin," 2-VII-1963 (J. v.d. Vecht) (RNH). 2 ♀♀; Paramaribo, "Charlesburg," 15-V-1963, Malaise trap (J. v.d. Vecht) (RNH). 1 ♀; Meerzorg, 15-V-1963 (J. v.d. Vecht, P. H. v. Doesburg, Jr.) (RNH). 3 ♂♂; 8 km east of Meerzorg, 15-V-1963 (J. v.d. Vecht) (RNH). 3 ♀♀; "Zanderij" kreekbos, 22-VI to 14-VII, 1964, Malaise trap (D. C. Geijskes) (RNH). 1 ♂; Paramaribo, Surinam, 28-I-1920 (Bollow) (ZMB).

12. *Tiphia (Tiphia) intermedia* Malloch

Tiphia intermedia Malloch, 1918:21 (for more complete list of references see Allen 1966b:302).

The descriptive notes below are based on male specimens in the United States National Museum. They were identified from the following localities; Agudulce, Panama; Chiriqui, Panama; "El Consejo," near Victoria, Venezuela; Puerto Cabello, Caracas,

Venezuela; San Esteban, Venezuela. It seems unlikely that a small species of *Tiphia* supposedly restricted to only a few *Phyllophaga* hosts would occur from south-eastern Canada to northern South America. However, I am unable to separate the South American specimens from the common species of the eastern United States.

MALE.—Head with punctures of uniform first-degree density on lower half, of second- or third-degree on upper half. Cheek slightly wider than an antennal fossa. Mandible without preapical cusp. Dorsal pronotum with a strong transverse carina; bordering sulcus with inconspicuous, short cross ridges at humeral angle. Lateral pronotum without groove or escarpment across its middle disc. Mesopleuron on its anterior aspect with only moderate numbers of small punctures usually separated by at least their average diameter, and fine secondaries more numerous than the primaries, at least on upper half. Hind coxa usually with ridge between inner and lower faces. Hind tibia on inner face strongly ridged. Tegula polished, outer margin orbicular, without marginal groove. Forewing slightly infumated; radial cell equal to second cubital cell in lateral extension. Dorsal propodeum with lateral discs without strong sculpturing. Tergum 1 without anterior transverse carina; preapical band a single row of deeply impressed punctures. Intermediate terga with moderate-sized punctures fairly evenly distributed, the posterior ones moderately enlarged; apices with a faint microscopic groove. Sternum 5 without lateral denticle.

Length 5.6 to 6.9 mm.

13. *Tiphia (Tiphia) insueta*, new species

FIGURES 9, 10

T. insueta is an unusual species described from the male. The radial cell moderately exceeds the second cubital cell in lateral extension, the first tergum has an anterior transverse carina, and terga 3 and 4 each has a high escarpment encircling the anterior part. These characters associate it in the key with *T. savanna*. It differs from *T. savanna* in possessing peculiar lateral, inverted U-shaped escarpments on the abdominal sterna and in other characters. It is apparently much more closely related to *T. vincenta* described from Sao Vincent in southern Brazil, which also possesses the peculiar inverted U-shaped escarpments of the abdominal sterna and a strong lateral denticle on

sternum 5. *T. insueta* differs from *T. vincenta* in lacking the peculiar infolded escarpment terminating the first tergum.

HOLOTYPE.—♂; Paramaribo, "Clevia," Surinam, 23-V-1963 (J. v.d. Vecht) (RNH).

MALE.—Front with punctures of close first-degree density on lower half and along eye orbits to level of lower ocellus, much sparser in middle area of upper front but without interspaces as wide as an ocellus; secondary punctures confined to lower half. Head width 2.0 (3 measured were 2.0, 2.0, 2.0) times least distance between eyes. Cheek slightly wider than an antennal fossa. Mandible with a strong preapical denticle.

Dorsal pronotum (Figure 9) with an exceptionally high transverse carina buttressed over entire length by many long, high ridges. Lateral pronotum with high, sharp-crested anterior process; disc dominated by a polished lunate depression limited on ventral side by an arclike escarpment. Mesopleuron on outer slope with moderate-sized primary punctures of third-degree density interspersed with secondaries that are slightly more numerous than the primaries; without subtegular patch of microsetae. Legs largely black. Hind tibia on inner face strongly carinate. Tegula glossy, without shagreening or groove on outer margin. Forewing strongly infusate; apical extension of radial cell moderately exceeds that of second cubital cell; sectors of second cubital cell in terms of inner sector (itob) are 10:26:16:24.

Dorsal propodeum with lateral areas slightly reticulate with enclosing carinae strongly buttressed; areola rectangular, about one and one-fourth times as long as wide, with complete, slenderly triangular median carina. Lateral propodeum on upper part with very strong, widely spaced rugulae. Tergum 1 with a high, regular transverse carina buttressed its entire length caudally by scalariform rugulae; preapical band not impressed, rather poorly defined from other dorsal punctures, 1 to 2 punctures wide, punctures medium-sized, irregularly placed, without terminal infolded escarpment. Terga 2 to 5 elevated terminally above the succeeding tergum; punctures of these terga extremely small and widely scattered, the terminal ones of each tergum scarcely extending beyond the middle. Sterna 3, 4, and 5 (Figure 10) with inverted U-shaped escarpment. Sternum 5 with an appressed polished denticle.

Length 6.5 to 7.3 mm.

FEMALE. — Unknown.

PARATYPES. — Both same locality as holotype. 1; 23-V-1963 (P. H. v. Doesburg, Jr.) (RNH). 1; 1-V-1963 (v.d. Vecht) (RNH).

14. *Tiphia (Tiphia) rossi*, new species

FIGURES 11, 46

T. rossi is a large, slender species with black wings. It differs from most species of the northern South American countries in having a short radial cell not exceeding the second cubital cell in lateral extension. In the key it runs to the couplet with *T. insueta* from which it differs in having black wings and in lacking the peculiar inverted U-shaped escarpments on the intermediate sterna.

HOLOTYPE. — ♂; 14 miles west of Fresno, Tolima, Colombia, 2,330 m, 16-III-1955 (E. I. Schlinger and E. S. Ross) (CAS).

MALE. — Entire front and vertex with coarse, uniform-sized, closely contiguous punctures; minutes abundant on lower half. Head width 1.8 least distance between eyes (3 measured were 1.7, 1.8, 1.8). Cheek wider than an antennal fossa. Mandible with a poorly defined preapical denticle.

Dorsal pronotum with sharp-crested transverse carina, bordered by deep sulcus completely scalariform from side to side; punctures coarse and deep, generally contiguous. Lateral pronotum with short, obscure rugulae in echelon across middle disc. Mesopleuron with punctures on anterior slope coarse, generally of first-degree density, tending to short rows, sometimes with minute secondaries nearly as numerous as primaries; subtegular patch of dense micropunctures lacking. Legs entirely black and very slender. Hind tibia 4.2 times as long as greatest width; without ridge on inner face; sensorium in a conspicuous, sunken, clavate groove about half as long as joint. Forewing (Figure 46) iridescent black with black veins; radial cell scarcely equaling second cubital cell in lateral extension; radius with bend and rudimentary spur two-fifths distance from stigma to intercubitus; second cubital cell much elongated, its sectors in relation to inner sector (itob) are 10:35:21:36.

Dorsal propodeum lateral to areola obscurely fine rugulae and coarse punctate; areola wider at apex than at base, with concave sides, and about twice as long as wide. Lateral propodeum with rugulae on upper part closely spaced and relatively weak me-

dially; lower part with long, erect microsetae on anterior three-fourths, and sparsely coarse punctate. First abdominal segment unusually elongate, as measured laterally, 1.3 times as long as wide. Tergum 1 with smooth, well-defined transverse carina; preapical band not impressed nor sharply defined, in middle 1 to 2 punctures wide, the punctures coarse and separated by less than their average diameter. Sternum 2 with conspicuous, keel-like callosity. Intermediate terga with moderately coarse punctures varying greatly in size, some on tergum 3 moderately enlarged and dimpled. Sternum 5 (Figure 11) with a very small, spinelike lateral denticle.

Length 9.8 to 11.7 mm.

FEMALE. — Unknown.

PARATYPES. — 2; same data as holotype (CAS).

15. *Tiphia (Tiphia) bogota*, new species

T. bogota has been described from a single male specimen from Bogota, Colombia. It runs in the key to the couplet with *T. savanna* from Surinam. It differs from that species in lacking iridescent eyes, or numerous minute punctures on the front or mesopleuron, and in having less conspicuous escarpments encircling the anterior parts of the intermediate terga.

HOLOTYPE. — ♂; Bogota (S. Lindig) no. 19898 (ZMB).

Head with very coarse punctures, contiguous on lower half, of first- or second-degree density on upper half, without interspaces as wide as an ocellus; secondaries absent. Eye mottled but not iridescent. Head width 2.3 times least distance between eyes. Cheek narrower than antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with strong transverse carina bordered by narrow sulcus and buttressed its entire length by short cross ridges. Lateral pronotum without groove across its disc. Mesopleuron on outer disc with medium-sized primary punctures generally of third-degree density although in some places separated by distances less than an average puncture diameter; with secondaries minute and much less numerous than primaries. Legs black. Hind tibia on inner face with a high carina for its entire length; sensorium very small, elongate oval. Tegula broadly shagreened; without groove on outer margin. Forewing with radial cell greatly exceeding second cubital cell in lateral

extension; sectors of second cubital cell in terms of inner sector (itob) are 10:28:18:27.

Dorsal propodeum shining and irregularly reticulate; areola keystone-shaped, only slightly longer than apical width. Tergum 1 with anterior transverse carina rudimentary, represented by 2 short, puncture-bordered escarpments broadly separated medially; preapical band a single row of coarse contiguous punctures without a bordering anterior escarpment. Intermediate terga each with an anterior encircling escarpment only moderately elevated; punctures coarse but not greatly enlarged. Sternum 5 without lateral denticles.

Length 10.4 mm.

FEMALE. — Unknown.

16. *Tiphia (Tiphia) ramara*, new species

FIGURES 12, 13

Described from a single female from which the abdomen became detached while in the author's possession. It has several characters not commonly encountered in South American *Tiphia*. These include the bright red legs, the enormously strong pronotal carina with the long, strong buttressing ridges, and the very coarse punctures of the mesopleuron.

HOLOTYPE. — ♂; Paramaribo, "Ma Retraite," 1964, Malaise trap (D. C. Geijskes) (RNH).

MALE. — Front on lower half and along eyes to level of ocellar triangle with very coarse, shallow, contiguous punctures, on upper half medially largely of second-degree density without interspaces as wide as an ocellus; without secondaries. Head width 2.4 times least distance between eyes. Cheek narrower than antennal fossa. Clypeal extension strongly bidentate. Mandible with obscure preapical denticle.

Dorsal pronotum (Figure 12) with an exceptionally high transverse carina buttressed by many long high ridges which extend in medium section halfway to posterior margin; punctures absent medially. Side of pronotum with anterior process exceptionally high and sharp crested; without groove across disc. Mesopleuron on anterior slope with its punctures closely contiguous and exceptionally large without secondaries. Legs from coxae to tips of tarsi brightly rufous. Tibia on inner face with narrow, naked carina. Tegula glossy, without groove on outer apical margin. Forewing with radial cell greatly exceeding second cubital

cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:26:18:19.

Dorsal propodeum with lateral discs coarsely reticulate; areola with convergent, slightly concave sides, its length equal to basal width and slightly exceeding apical width. Tergum 1 with a strong regular transverse carina obscurely buttressed; preapical band a single row of very coarse contiguous punctures, impressed only on anterior margin. Terga 3, 4, and 5 (Figure 13) each with several large, dimpled punctures mixed with much more numerous smaller ones. Sternum 5 without preapical denticle.

Length 5.0 mm.

FEMALE. — Unknown.

17. *Tiphia (Tiphia) pacoza* Allen

FIGURE 47

Tiphia pacoza Allen, 1964:1.—Allen 1971 (complete).

Tiphia williamsi Allen, 1965:77.—Allen 1971 (complete).

This species, known only from the male, has been identified from as far north as Durango, Mexico, the Panama Canal Zone, Venezuela, and Colombia. In Colombia it was taken at altitudes ranging from 920 to 1,630 meters. Its principal diagnostic characters are a cheek much narrower than an antennal fossa, a radial cell much exceeding the second cubital cell in lateral extension, a well-developed transverse carina on the first tergum, and no escarpment encircling the anterior part of the intermediate terga. In the key it runs to the couplet with *T. ramara* from which it is distinguished by having a dorsal pronotum having only a moderately strong carina with short buttressing ridges back of which there are numerous punctures. In addition to the holotypes, there are numerous paratypes from the Panama Canal Zone.

HOLOTYPE. — ♂; Barro Colorado, Canal Zone, Panama, 16-VI-1956 (C. W. and M. E. Rettenmyer) (USNM).

MALE. — Head width 2.3 times least distance between eyes. Cheek not wider than an antennal fossa. Transverse carina of pronotum not heavily buttressed. Hind tibia on inside with high, narrow carina. Tegula without well-developed groove on lateral margin. Forewing (Figure 47) with radial cell greatly exceeding second cubital cell in lateral extension. Tergum 1 with an obscure, crooked transverse carina flanked with coarse, shallow punctures. Terga 2 to 4 not abruptly elevated at junction with succeeding tergum:

with enlarged middle punctures much larger than those in front and behind. Fifth sternum without lateral denticle. Length 6.9 to 11 mm.

This species has also been identified from the following South American localities: COLOMBIA: Bogota (ZMB); near Cali (CAS); "Fusagasuga," Cundinamarca (USNM); "La Sierra" (USNM); 32 miles north of Pasto, Narino (CAS); near Villavicencio (CAS). VENEZUELA: Caracas (USNM); "La Vega," near Caracas (USNM).

18. *Tiphia (Tiphia) vandervechti*, new species

T. vandervechti is one of several metallic-colored species of *Tiphia* described from Northern South America or the Amazon Valley. These species have no structural characters alien to *Tiphia* and do not seem closely related to each other. They are very rare in collections. *T. vandervechti* is known only from the holotype specimen. It differs from *T. caerulea*, also from northern South America, in having a much elongated tegula. It resembles *T. chalybea* of the Amazon Valley in having a much elongated tegula, but differs from that species in having only a rudimentary transverse carina of the dorsal pronotum, and in having a distinct anteromedian escarpment on the scutum.

HOLOTYPE.—♀; "Raleigh Falls," Coppename River, Surinam, 17-V-1963 (E. v.d. Vecht) (RNH).

FEMALE.—Body entirely metallic dark green.

Front with irregularly coalesced punctures on lower third and in a row along inner eye orbits; medially on upper front with an irregularly distributed cluster of 15 exceptionally large punctures and several large secondaries; with 2 interspaces as wide as an ocellus. Antennal flagellum uniformly brown. Mandible with a conspicuous, sharply pointed preapical denticle. Mouth parts typical of *Tiphia*.

Dorsal pronotum with very coarse primary punctures, medially confined to anterior two-fifths, transverse carina present except on a narrow median gap. Lateral pronotum with a conspicuous, narrow groove across middle disc. Scutum with short anteromedian escarpment well-separated from notaulices, medially with plaque of punctures of first-degree density. Mesopleuron on outer disc with large primary punctures generally of third-degree density but with some rows of second-degree, and with a few widely scattered secondaries; subtegular area without dense microsetae. Legs except tarsi dark metallic green. Tibia with a

strong ridge on inner face; sensorium ovoid, about twice as long as wide and not more than a seventh width of joint. Hind basitarsus not grooved. Tegula about twice as long as wide with apical margin truncate; broadly but faintly shagreened. Fore and hind wing black. Forewing with stigma separated by more than its length from basal vein; radius with a conspicuous bend in its first section without backward-directed spur; radial cell 4.0 times as long as wide.

Dorsal propodeum outside areola strongly sculptured with a combination of faint rugulae and punctures fading laterally to faint shagreening; areola less than twice as long as apical width, with concave sides, broader at apex than at base, with ladder-like rugulae on each side of triangular median carina. Lateral propodeum on upper part with rugulae coarse and widely separated; lower part with narrow belt of dense microsetae on ventral border. Tergum 1 with a smooth, regular transverse carina not bordered with punctures or short ridges; preapical band an irregular belt of coarse punctures, not impressed and one or two punctures wide. Intermediate terga sparsely punctate with very small punctures, the apical row on terga 3 and 4 separated from apices by 6 to 8 times diameter of largest punctures. Sternum 2 with a perceptible anteromedian callosity. Pygidium finely punctate on basal half; impunctate part glossy and almost free of wrinkles or shagreening.

Length 12.5 mm.

MALE.—Unknown.

19. *Tiphia (Tiphia) caerulea*, new species

T. caerulea has been described from the holotype specimen, somewhat damaged, lacking tarsi of middle and hind legs, and most of both antennae. It can be distinguished at once from two other species of metallic-colored *Tiphia* from South America, since it has short, obicular tegulae. It has been grouped in the key with *T. vandervechti* because of the metallic body color. Actually the two species do not appear to be closely related. According to a letter from L. L. Pechuman of Cornell University, Naiguata is a locality in the Distrito Federal, Venezuela.

HOLOTYPE.—♀; "Los Canales," Naiguata, D.F., Venezuela, "F 20 mts;" 24-VII-1939 (V. Berthier) (CU).

FEMALE.—Body completely and uniformly dark blue and with only short, sparse, inconspicuous hairs.

Front with punctures on lower half of well-separated first-degree density, sparser on upper half but without interspaces wider than an ocellus. Clypeal extension definitely bidentate; lateral carina strongly overhanging the lateral pit. Area ventral to oral openings deeply depressed. Mandible stout, very short, terminating almost on median line, without preapical cusp.

Dorsal pronotum with transverse carina complete with a sharp, regular crest; punctures uniformly distributed in a pattern of second-degree density. Lateral pronotum with a well-defined escarpment across disc. Scutum with median plaque of punctures of first-degree density and anteromedian escarpment not connected with notaulices. Mesopleuron with coarse punctures largely of first-degree density on anterior slope; subtegular patch of micropunctures narrower than tegula. Hind tibia not inflated nor arched on upper margin, angular in cross section with broadly triangular sensorium flush with surrounding area. Hind basitarsus missing. Tegula very faintly shagreened without marginal grooves. Both wings deeply infumate. Forewing with radius sharply bent two-fifths distance to intercubitus and terminating in long, outwardly directed spur; stigma separated by less than its length from basal vein.

Dorsal propodeum with rectangular areola slightly more than 3 times as long as wide. Lateral propodeum with rugulae on upper part not numerous and widely separated.

Tergum 1 with anterior transverse carina; dorsum laterally with coarsely punctate areas; preapical band reduced to an irregular line of about 8 punctures, not impressed. Sternum 2 with perceptible anteromedian callosity. Intermediate terga with punctures ranging in size from minutes to coarse, with the largest on tergum 3 shallow and dimpled. Pygidium punctate on basal half; apical half not wrinkled or shagreened.

Length 8.6 mm.

MALE.—Unknown.

20. *Tiphia (Tiphia) colombiana*, new species

This is another South American *Tiphia* with a metallic-colored body. As with the other 3 described species, there are no characters not occurring in other *Tiphia*. Oddly, none of the 4 appear closely related. *T. colombiana* lacks the much elongated tegulae of *T. vander-*

vechti and *T. chalybea*, and the anterior transverse carina of the first tergum found in the *caerulea*. It attains nearly the maximum size for the genus *Tiphia* of over 20 millimeters.

HOLOTYPE.—♀; Bogota (S. Lindig) (ZMB).

FEMALE.—Body and legs uniformly metallic blue.

Entire front and vertex set with coarse, closely contiguous punctures. Antennal flagellum slender, first 3 joints 3.3 times as long as wide. Clypeus with its median extension scarcely wider than an antennal fossa; lateral carina very long and sharply defined. Mandible with a strong preapical cusp.

Dorsal pronotum with a low, complete transverse carina, not buttressed; punctures of first-degree density, and of uniform size and distribution. Lateral pronotum with a poorly defined groove across its disc. Scutum with its anteromedian escarpment not connected with notaulices. Mesopleuron on anterior slope uniformly set with coarse punctures of first-degree density, and an occasional secondary puncture; no fine microsetae in subtegular area or on upper part of posterior slope. Hind tibia on inner face sharply carinate; sensorium broadly triangular and at least a third as wide as joint. Hind basitarsus without groove. Tegula only slightly longer than wide, without groove on outer margin, very obscurely shagreened. Forewing deeply infumate; stigma separated by more than its length from basal vein; first section of radius with backward directed spur, which is sometimes long and sclerotized; radius without terminal spur.

Dorsal propodeum outside areola very faintly shagreened; areola with concave sides, apex as wide as base, carinae very weak, length about two and one-half times apical width. Lateral propodeum with coarse rugulae, widely separated; lower part almost free of fine microsetae. Tergum 1 without anterior transverse carina; preapical band not impressed and very poorly defined, in middle represented by only a few fine, widely separated punctures. Intermediate terga with numerous very fine punctures separated into anterior and posterior concentrations; at apices with a row of closely spaced micropunctures interrupted medially on terga 2 and 3. Pygidium finely punctate on basal three fifths; apex not wrinkled and entirely shagreened.

Length 16.9 to 20.5 mm.

MALE.—Unknown.

PARATYPES.—2; same data as holotype (ZMB). 1; Colombia (Moritz) (ZMB).

21. *Tiphia (Tiphia) huallaga*, new species

The holotype of this species is from Peru. For detailed description see *Tiphia* from the Peru-Ecuador-Bolivia area. Paratypes are from Colombia and Venezuela.

22. *Tiphia (Tiphia) wosuna*, new species

T. wosuna is described from a single female. In the key it runs to the same couplet as *geijskesi*. It differs from the female of the latter in lacking a slender groove across the disc of the lateral pronotum, or a groove on the outer margin of the tegula, and the upper margin of the hind tibia is not strongly arched. It can be distinguished from specimens of *savanna* in which the anterior encircling escarpments of the terga are concealed, by the much finer, more numerous, and uniform-sized puncturation of the abdominal terga.

HOLOTYPE.—♀; Paramaribo, "Zorgen Hoop, Wasuna Terr.," Surinam, 1/5-II-1965 (D.C. Geijskes) (RNH).

FEMALE.—Front with moderate-sized punctures of first-degree density on lower third and irregularly on median area almost to level of lowest ocellus, elsewhere of second-degree without interspaces as wide as an ocellus. Mandible with rudimentary preapical denticle.

Dorsal pronotum with a low, complete transverse carina; with moderate-sized punctures denser in band at apex of punctate part. Lateral pronotum without groove across middle of disc; faint parallel rugulae in ventral corner. Mesopleuron with subtegular patch of dense microsetae as wide as tegula. Legs black. Hind femur not unusually stout. Hind tibia with inner face moderately carinate, upper border not arched, with small oval sensorium flush with surrounding surface and scarcely one-seventh width of joint. Hind basitarsus grooved. Tegula glossy without shagreening; without groove about outer margin. Forewing moderately infumate; stigma separated by its length from basal vein; radius without inwardly directed spur on its first section and without terminal spur; radial cell 3.1 times as long as wide.

Dorsal propodeum with lateral discs glossy with extremely faint shagreening; areola slightly tapered, its length about 2 times its apical width. Lateral propodeum with rugulae strong and on anterior half widely separated: lower part posteriorly with only short inconspicuous microsetae. Tergum without anterior

transverse carina; preapical band a single slightly impressed row of fine punctures; in middle separated by slightly more than their average diameter. Intermediate terga with numerous medium-sized punctures fairly uniformly distributed except for small, nearly impunctate areas on terga 3 and 4. Pygidium closely fine punctate on basal half; impunctate apex wrinkled near punctate part but not shagreened.

Length 12.0 mm.

MALE.—Unknown.

23. *Tiphia (Tiphia) oblonga* Smith

Tiphia oblonga Smith, 1879: 187.—Allen 1962: 70.

The holotype from Colombia in the British Museum, originally described in 1879, and more fully re-described by Allen in 1962, is the only identified representative of this species. Its most distinguishing character is the complete median carina on the posterior aspect of the propodeum, not commonly occurring among American species. Other distinguishing characters are the wide impunctate interspaces of the upper front, the ungrooved hind basitarsus, the elongate radial cell of the forewing, the absence of an anterior transverse carina on the first tergum and of enlarged punctures on the intermediate terga.

FEMALE.—Front on upper half with several interspaces as wide as an ocellus. Mandible without preapical cusp. Dorsal pronotum with transverse carina lacking over median third or more. Lateral pronotum flat and without conspicuous sculpturing. Mesopleuron on outer disc with primary punctures fine and of third-degree density. Scutum with anteromedian escarpment not connected with notaulices. Legs black. Hind tibia on inner face sharply carinate. Hind basitarsus without groove. Tegula obscurely shagreened, without marginal grooves. Forewing heavily infumate; radius with a sharp bend in first section and terminating in an outwardly directed spur; radial cell 4.1 times as long as wide. Dorsal propodeum with its lateral discs smooth; lateral sulcus well-developed, without an inside carina; areola rectangular, about three and one-fourth times as long as apical width. Posterior aspect of propodeum with a narrow, complete median carina. Tergum 1 without transverse carina; dorsum with only scattered inconspicuous punctures except the preapical band which is a single row of very coarse, deep punctures not impressed, and coalesced for only a short distance in middle. Terga 3 and 4 with broad

impunctate areas; the impunctate apices are broad ribbons more than twice diameter of an ocellus. Pygidium shallowly punctate on basal half; impunctate apex wrinkled, and broadly shagreened to near tip.

Length 11.5 mm.

MALE.—Unknown.

24. *Tiphia (Tiphia) silvae*, new species

Described from the holotype and one paratype female taken from the same locality in Surinam. This species shares most of the same characters with *T. surinam*. It differs from that species in having a more poorly defined groove on the lateral pronotum, finer and more closely spaced rugulae on the lateral propodeum, and a somewhat denser and broader band of punctures on the intermediate terga.

HOLOTYPE.—♀; Paramaribo, "Ma Retraite," swamp forest, Malaise trap, 18/23-II-1964 (D.C. Geijskes) (RNH).

FEMALE.—Front on lower third with moderate-sized punctures of first-degree density; elsewhere more widely dispersed, but without interspaces as wide as an ocellus.

Dorsal pronotum without transverse carina except obscurely at humeral angle; punctures more concentrated in band at apex of punctate part. Lateral pronotum with a poorly defined gash across middle disc. Scutum with anteromedian escarpment and notaulices sometimes connected. Mesopleuron on anterior face with moderate-sized punctures of first- or second-degree density; secondaries lacking; subtegular patch of dense microsetae slightly narrower than tegula. Legs black. Hind femur not exceptionally stout. Hind tibia on inner face with strong carina and pyriform sensorium flush with surrounding surface and about one-seventh as wide as joint. Hind basitarsus without groove. Tegula glossy, without shagreening or groove on outer margin. Forewing densely infumate; stigma separated by nearly its length from basal vein; radius on first section without inwardly directed spur; with an outwardly directed spur on terminal section; length of radial cell 3.2 times its width.

Dorsal propodeum on lateral discs with sparse minute punctures and very fine shagreening. Lateral propodeum on upper part with extremely fine, closely spaced rugulae not sharply delimited from lower, finely aciculate part; microsetae absent. Tergum 1 with low, regular transverse carina not flanked with

cross ridges or punctures. Intermediate terga without anterior encircling escarpments; set with dense punctures of moderate and approximately uniform size and distribution. Pygidium rugose punctate on basal three-fifths, impunctate apex glossy and almost free of wrinkles.

Length 8.7 to 11.3 mm.

MALE.—Unknown.

PARATYPE.—1; same locality as holotype, 20/22-I-1964 Malaise trap (D. C. Geijskes) (RNH).

25. *Tiphia (Tiphia) surinam*, new species

This species is distinguished from most other female *Tiphia* from northern South America by the absence of a basitarsal groove and the presence of a transverse carina on the first tergum. A very distinctive character which separates it at once from *T. silvae*, is the anterior transverse escarpments of the intermediate terga. Unfortunately, this character is concealed by the preceding terga except in those specimens in which the abdomen is fully extended. *T. surinam*, is described from the holotype and 3 paratype specimens from Surinam.

HOLOTYPE.—♀; Paramaribo, "Clevia," Surinam, 23-V-1963 (J. v.d. Vecht) (RNH).

FEMALE.—Front with punctures of first-degree density on lower half, of third-degree on much of upper half without interspaces wider than an ocellus. Clypeal extension not broadly arcuate.

Dorsal pronotum without transverse carina; punctures fairly uniform in size and distribution. Lateral pronotum with anterior process sharp-crested to ventral angle; with a broad, shining, well-defined groove across middle disc. Mesopleuron with primary punctures principally of first-degree density; with a few large secondaries; subtegular patch of dense microsetae scarcely as wide as tegula. Scutum with anteromedian escarpment usually not connected with notaulices. Legs black. Hind femur at least twice as long as greatest width. Hind tibia with inner face carinate to friction plate; upper margin not arched; sensorium pyriform, flush with surrounding surface, about one-fourth as wide as joint. Hind basitarsus not grooved. Tegula glossy, not shagreened, without groove on outer margin. Forewing moderately infumated; stigma separated by distance equal to its own length from basal vein; radius without trace of spur on first section but terminating in an outwardly directed spur.

Propodeum outside areola very faintly shagreened with shallow, scattered minute punctures; areola slightly tapered to rectangular, two and one-fourth to two and one-half times as long as wide, middle carina linear and almost complete. Lateral propodeum on upper part with coarse, widely separated rugulae; lower part on posterior half with patch of relatively short, sparse microsetae. Tergum 1 with a low, regular transverse carina not flanked with punctures or strong cross ridges; preapical band in middle somewhat irregular and about 2 punctures wide, not impressed. Terga 3, 4, and 5 each with weak anterior transverse escarpments, with punctures coarse, of nearly uniform size, and generally of first-degree density; terga 2, 3, and 4 terminating in broad, polished, impunctate ribbons. Pygidium on basal three-fifths closely rugose punctate; impunctate apex faintly wrinkled and shagreened; bristles very dark.

Length 8.5 to 9.4 mm.

MALE.—Unknown.

PARATYPES.—1; same data as holotype (RNH). 1; same locality as type, 1-V-1963 (P. H. V. Doesburg Jr.) (RNH). 1; "Marcerburg," Surinam, 23-VI-1963 (J. v.d. Vecht) (RNH).

26. *Tiphia (Tiphia) aguacatal*, new species

This species known only from the holotype specimen. The absence of a hind basitarsal groove and of a carina on the hind basitarsus limits this species to a relatively small group. Its other outstanding characters are the widely impunctate interspaces of the front, the strong transverse carina of the dorsal pronotum, the strong connection between the anteromedian escarpment and the notaulices of the scutum, and the fine punctures of the mesopleuron and the abdominal terga.

HOLOTYPE.—♀; with the following information on its labels: "Rio Aguacatal/Colomb. W. Codr./2000 m /coll. Fassl." (ZMB).

FEMALE.—Front with a mixture of moderately coarse punctures and large secondaries, principally of third-degree density, with many interspaces wider than an ocellus. Antennal flagellum with first 3 joints 3.3 times as long as wide. Mandible without preapical cusp.

Dorsal pronotum with transverse carina complete and regularly aligned, bordered by a shallow, very narrow, and faintly crossridged sulcus. Primaries

chiefly of 2 sizes and concentrated in a transverse band, anterior to which are wide impunctate areas. Lateral pronotum with a narrow groove extending part way across disc. Scutum with anteromedian escarpment and notaulices strongly connected. Mesopleuron on anterior face with only a very few primary punctures, and many more secondaries, interspaces generally several times diameter of the larger punctures; subtegular patch of micropunctures about as wide as tegula. Legs black. Hind leg stout. Hind tibia on inner face slightly ridged; sensorium an equilateral triangle nearly one-third width of joint. Hind basitarsus not grooved. Tegula broadly, but faintly shagreened; without groove on outer margin. Forewing with stigma separated by slightly more than its length from basal vein; radial cell without apical spur.

Dorsal propodeum very finely and faintly shagreened; areola slender, tapered, more than 4 times as long as apical width. Lateral propodeum with strong but numerous closely spaced rugulae; lower part with only a few inconspicuous microsetae. Tergum 1 without anterior transverse carina; punctures except for preapical band reduced to sparse, widely separated minutes; preapical band not impressed on either border and consisting of coarse, closely set primaries. Sternum 2 without anterior median callosity. Terga 3 and 4 with very small punctures grouped around broad impunctate areas. Pygidium punctate on basal half; impunctate part not wrinkled, shagreened almost to apex.

Length 12.5 mm.

MALE.—Unknown.

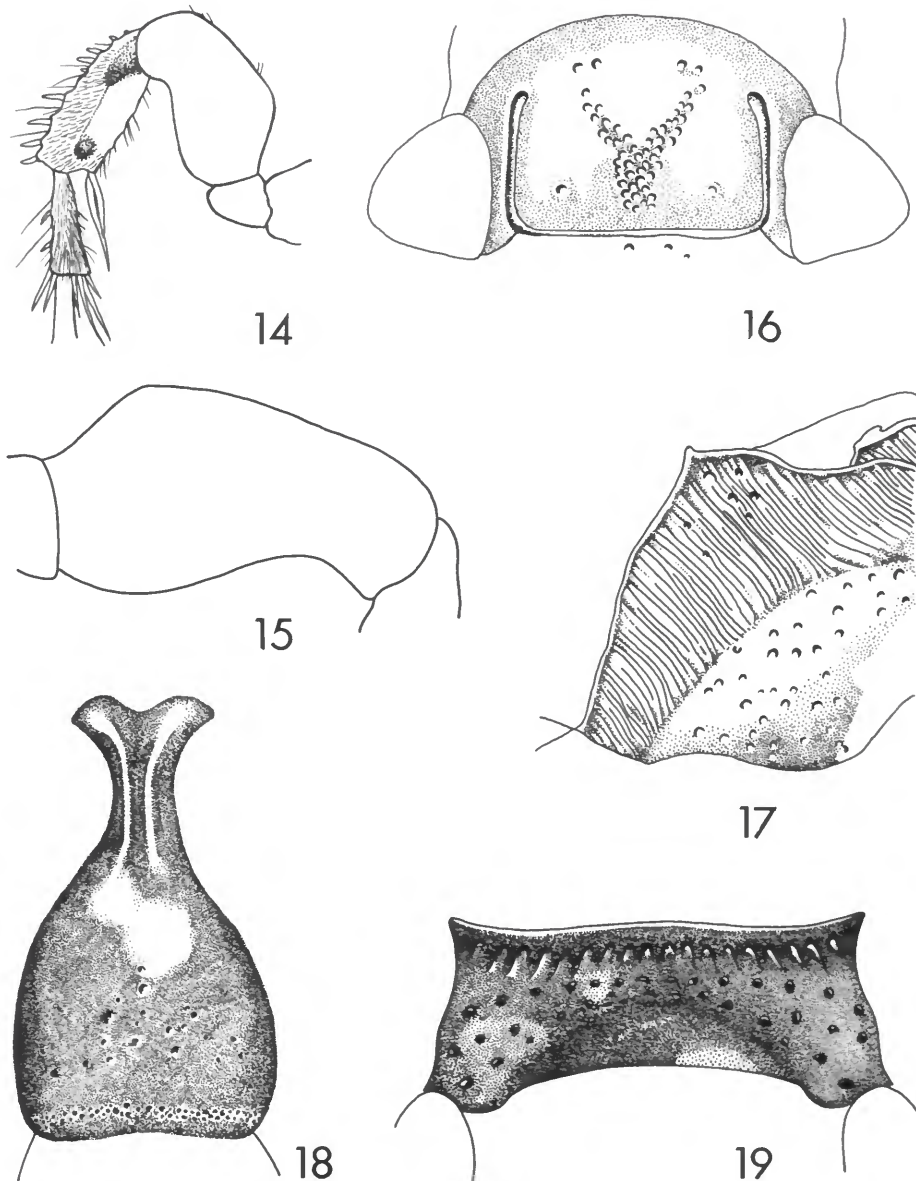
27. *Tiphia (Tiphia) bartica*, new species

FIGURE 14

T. bartica has been described from the holotype female and 2 female paratypes from British Guiana. The species has few exceptional characters. It has no groove on the hind basitarsus, no anterior transverse carina on the first tergum, there are several impunctate spaces on the upper front as wide as an ocellus and the rugulae of lateral propodeum are numerous and closely spaced. It differs from *T. phedra* in having rufous legs and tegula, and in possessing much shorter, stouter legs.

HOLOTYPE.—Bartica, British Guiana, 17-V-1901 (ANSP).

FEMALE.—Front with punctures sparse, on upper two-thirds of third- or second-degree density with several interspaces wider than an ocellus.



FIGURES 14-19.—14, Female, leg of *Tiphia bartica*, new species, from Bartica, British Guiana. 15, female, leg of *Tiphia phedra*, new species, from Coppename River, Surinam. 16-17, female of *Tiphia huallaga*, new species, from "Anduza" Venezuela: 16, scutum showing absence of anteromedian escarpment; 17, lateral propodeum showing punctures on lower part. 18, male of *Tiphia hodgesi*, new species, from near Al'Oag Pichincha, Equador, showing elongated tergum 1. 19, male of *Tiphia pallisteri*, new species, from Moyobama, San Martín, Peru, showing heavily buttressed transverse carina of pronotum.

Dorsal pronotum with a faint line of scallops in the usual position of the transverse carina; punctures of variable density. Lateral pronotum without rugulae in ventral corner, or escarpment across middle disc. Mesopleuron on anterior slopes with only a few large primary punctures which are separated by more than their average diameter, and about an equal number of large secondaries; subtegular patch of dense secondaries about as wide as tegula. Scutum with a median plaque of coarse, contiguous punctures; anteromedian escarpment not connected with notaulices. Legs and tegula red to castaneous. Hind leg (Figure 14) with femur, tibia, and basitarsus unusually short and stout; hind femur less than 2.0 times as long as greatest width. Hind tibia on inner face with a median ridge; sensorium almost circular, about one-sixth width of joint and flush with surrounding surface. Hind basitarsus without groove. Tegula without trace of shagreening, or marginal grooves. Forewing with a very small stigma separated by much more than its length from basal vein; radius with first section not sharply bent, terminating in a long outwardly direct spur; area of first cubital cell 39.5 times that of stigma.

Dorsal propodeum with area lateral to areola smooth, with dense minute punctures; areola very slender with nearly straight sides, about 4 to 5 times as long as apical width. Lateral propodeum on upper part with many closely spaced rugulae. Tergum 1 without patch of dense micropunctures on anterior aspect; without transverse carina; lateral dorsum with an area of dense, coarse punctures which narrow into a preapical band medially one puncture wide, moderately impressed, with an escarpment on anterior margin, punctures separated by less than their average diameter. Terga 3, 4, and 5 with punctures generally of close first-degree density, with none exceptionally enlarged; with broad, polished, ribbon-like apices. Pygidium punctate on apical three-fifths, impunctate apex not wrinkled or shagreened.

Length 8.5 to 9.4 mm.

MALE.—Unknown.

PARATYPES.—2; Bartica, British Guiana, 24-II-1913 (CU).

28. *Tiphia (Tiphia) phedra*, new species

FIGURE 15

As represented by the holotype female and 4 paratype females, this species contains a somewhat heterogenous

series from Surinam in which the basitarsus is not grooved, the first tergum has no anterior transverse carina, the lateral propodeum has numerous closely spaced rugulae, the preapical band on the first tergum is usually sharply depressed on the anterior border, and there are not anterior transverse escarpments on the intermediate terga. It differs from *T. bartica* in having black legs with more slender hind femora.

HOLOTYPE.—♀; "Phedra," Surinam, 14/20-XII-1964 (D. C. Geijskes) (RNH).

FEMALE.—Front with punctures of first-degree density on lowest third, elsewhere of second- or third-degree with one or two interspaces about as wide as an ocellus. Mandible without preapical cusp.

Dorsal pronotum usually without transverse carina. Lateral pronotum without a well-defined groove across its disc or rugulae in ventral corner. Scutum with anteromedian escarpment and notaulices usually not connected. Mesopleuron on anterior slope with fine primary punctures separated in most directions by much more than their average diameter, about an equal number of large secondaries, and with dense microsetae extending downward from broad subtegular patch along prepectal carina almost to ventral aspect. Legs chiefly black. Hind femur (Figure 15) not exceptionally stout. Hind tibia on inner face with a longitudinal carina; sensorium flush with surrounding area. Hind basitarsus without groove. Tegula glossy, not shagreened, without groove on outer margin. Forewing moderately infumate; stigma separated by much more than its length from basal vein; radius without spur at bend of first section, with outwardly directed spur at its terminus; length of radial cell to end of spur 3.5 times its width.

Dorsal propodeum with its lateral discs essentially unsculptured; areola with sides slightly concave and slightly convergent, its length more than 3 times its apical width. Lateral propodeum on upper part with rugulae very fine and closely spaced; lower part with narrow band of dense microsetae bordering metacoxal cavity. Posterior aspect of propodeum without median carina. Tergum 1 without transverse carina; preapical band abruptly impressed on upper border, and consisting of a single row of small, widely separated punctures. Terga without anterior transverse escarpments; with median-sized punctures of approximately the same size, those on terga 2 and 3 tending toward transverse bands, on terga 3 and 4 medially separated from apex by about 3 times diameter of larger punc-

tures. Pygidium punctate on basal half; usually faintly shagreened near punctate part.

Length 7.8 to 10.1 mm.

MALE.—Unknown.

PARATYPES.—1; "Phedra," 16/22-XI-1964 (D. C. Geijskes) (RNH). 1; Coppename River, "VOLTZ Mountain," Surinam, 14-VII-1963 (J. v.d. Vecht) (RNH). 1; "Zanderij" kreekbos, Surinam, 14/17-1964, Malaise trap (D. C. Geijskes) (RNH). 1; Coppename River, "Raleigh Falls," Surinam, 13/18-VII-1963 (J. v.d. Vecht) (RNH).

Tropical Brazil

The only *Tiphia* I have seen from tropical Brazil are 5 species from far up the Amazon at a locality now known as Teffé. These species appear to be distinct from those described from the countries to the north and west of Brazil, and from those of southern Brazil and Argentina. The types of these Amazonian species in the British Museum of Natural History have all been described in detail by the author. Synopses of these descriptions appear below.

Key to Males: Tropical Brazil

- | | |
|--|-------------------------------|
| 1. Sternum 5 without lateral denticles; tergum 1 with preapical moderate-sized impressed punctures | 29. <i>T. campanula</i> Smith |
| Sternum 5 with lateral denticles; tergum 1 with preapical band obsolete | 30. <i>T. solitaria</i> Smith |

Key to Females: Tropical Brazil

- | | |
|---|--------------------------------|
| 1. Hind basitarsus on inner face with vestigial longitudinal groove | 31. <i>T. salutatrix</i> Smith |
| Hind basitarsus on inner face without longitudinal groove | 2 |
| 2. Body metallic blue | 32. <i>T. chalybea</i> Smith |
| Body black or partly reddish | 33. <i>T. parallela</i> Smith |

29. *Tiphia (Tiphia) campanula* Smith

Tiphia campanula Smith, 1879:186.—Allen 1962:62.

The most distinctive characters are the narrow cheeks, the complete row of buttressing ridges of the dorsal pronotum, the lack of transverse carina on the first tergum and of sternal denticles, and the brush of fine hairs on the sixth sternum.

MALE.—Front on upper part without interspaces as wide as an ocellus. Cheek narrower than antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with a high transverse carina buttressed its entire length with many distinguishable cross ridges. Mesopleuron with primary punctures on its disc widely spaced with only a few interspaced minute secondaries. Hind tibia with a conspicuous carina on its inner face. Tegula not elongated, without shagreening or marginal groove. Forewing nearly hyaline; radial cell greatly exceeding second cubital cell in lateral extension.

Dorsal propodeum lateral of areola without strong sculpturing. Posterior aspect of propodeum without median carina. Tergum 1 without transverse carina; preapical band a single narrow row of punctures

deeply impressed, the punctures coalesced. Terga 3 and 4 with punctures near middle much larger and sparser than those anterior to them. Sternum 5 without lateral denticles. Sternum 6 medially with a conspicuous brush of yellowish hairs.

Length 6 mm.

FEMALE.—Unknown.

Known only from the designated type specimen in the British Museum from Teffé, Brazil.

30. *Tiphia (Tiphia) solitaria* Smith

Tiphia solitaria Smith, 1879:185.—Allen 1962:63.

T. solitaria differs from most South American species of *Tiphia* in having a conspicuous denticle on the fifth sternum, and from an even larger number by the absence of a preapical band of punctures on the first tergum. The absence of a transverse carina on tergum 1 and the presence of a much elongated radial cell are traits it has in common with numerous other South American species.

MALE.—Front width coarse contiguous punctures except in small area anterior to ocellar triangle where

there are interspaces as wide as an ocellus. Cheek slightly wider than an antennal fossa. Mandible without preapical cusp.

Dorsal pronotum with transverse carina strongly buttressed with short ridges for its entire length. Lateral pronotum with its anterior process massive and broadly rounded, bordered by an excavation crossed by 5 ridges buttressing anterior process, and in addition a fairly distinct curved groove across lower part of disc. Mesopleuron without punctures on outer disc. Legs black, piceous apically. Hind coxa with a prominent carina between inner and ventral faces. Hind tibia without carina or naked streak on inner face. Tegula black to piceous, slightly longer than wide, broadly but faintly shagreened, without marginal grooves. Forewing moderately infumated; radial cell greatly exceeds second cubital cell in lateral extension.

Dorsal propodeum with sculpturing of area lateral to areola limited to sparse micropunctures; areola twice as long as apical width, later four-fifths basal width, median carina narrowly triangular. Tergum 1 without anterior transverse carina; punctures on anterior and dorsal aspects very fine, sparse; without preapical band of punctures. Fifth sternum with a well-developed lateral denticle having a longitudinal axis and a bordering excavation on inner margin.

Length 11 mm.

FEMALE.—Unknown.

This species is known only from the type specimen from Teffé, Brazil, in the British Museum.

31. *Tiphia (Tiphia) salutatrix* Smith

Tiphia salutatrix Smith, 1879:186.—Allen 1962:64.

T. salutatrix is one of 3 species from tropical Brazil described from the female sex. It differs from the other two in having a groove on the basitarsus. It also differs from *T. chalybea* in not having a metallic-colored body. It is much smaller than *T. parallela* and differs from it in lacking any trace of transdiscal groove on lateral pronotum.

FEMALE.—Front with punctures chiefly of first-degree density on upper half.

Dorsal pronotum without transverse carina, with a impunctate area posterior to humeral angle. Lateral pronotum without ventral rugulae or groove across disc. Legs, except coxae, red. Hind tibia with a sharp carina on inner face. Hind basitarsus with shallow, vestigial groove. Tegula thinly translucent, red, glossy,

not longer than broad, without marginal grooves. Radial cell 3.3 times as long as wide, with a well-developed outward directed spur.

Areola of dorsal propodeum about 3 times as long as apical width, latter three-fourths times basal width, sides straight. Tergum 1 without anterior transverse carina; entire face of anterior slope and dorsal aspect almost impunctate; in the usual locale of the preapical band of punctures there is a linear depression marked anteriorly by a sharply impressed line. Terga 3, 4, and 5 each with a ribbon-like terminal belt, about 2 ocellar-diameters wide. Pygidium punctate on basal half but not closely so, with a broad impunctate emargination; impunctate part glossy, devoid of wrinkles or shagreening.

Length 6.5 mm.

MALE.—Unknown.

This species is represented by the single type specimen from Teffé, Brazil, in the British Museum.

32. *Tiphia (Tiphia) chalybea* Smith

Tiphia chalybea Smith, 1855:84.—Allen 1962:66.

This species has the usual structural characters of the genus *Tiphia* but differs from most species in having a dark blue metallic body, bright pink ocelli, and wings (both fore and hind) that are opaque black. *T. chalybea* differs from *T. caerulea* in having a conspicuously elongated tegula, about twice as long as wide. It is certainly a close relative of *T. vandervechti* but differs in having no anteromedian escarpment or medial plaque of coarse punctures on the scutum, a tegula which is strongly shagreened, a cubital cell of the forewing which is shorter than that of *T. vandervechti*, and an intercubital spur as in *Paratiphia*.

FEMALE.—Front with coarse punctures widely scattered on upper part except for contiguous row along inner eye orbit. Mandible with conspicuous preapical cusp.

Dorsal pronotum with a high, erect carina complete from side to side and well-buttressed laterally. Lateral pronotum with a complete groove across middle of disc. Scutum without trace of anteromedian escarpment or median plaque of coarse, contiguous punctures. Hind basitarsus without groove. Tegula slightly less than twice as long as wide, strongly shagreened. Forewing and hind wing black. Forewing with partially developed first intercubitus as in *Paratiphia* but extending less than halfway across cell; radius at its

apex with a well-developed spur; radial cell 3.2 times as long as wide.

Areola of dorsal propodeum with sides concave and apex as broad as base, length about one and one-half times apical width, median carina broadly expanded. Posterior aspect of propodeum without median carina. Tergum 1 with strong transverse carina; preapical band one puncture wide, abruptly impressed on anterior border and separated from apex by one-third distance from apex to transverse carina. Pygidium coarsely rugose on basal three-fourths; narrow apex polished, dark orange, without shagreening.

Length 14 mm.

MALE.—Unknown.

Known only from the designated type in the British Museum from Teffé, Brazil.

33. *Tiphia (Tiphia) parallela* Smith

T. parallela Smith, 1879:185.—Brèthes 1910:253.—Allen 1970:252.

During 1913 and for several years following notes appeared in the literature on the biology of a species of *Tiphia* called *T. parallela* Smith. A *Tiphia* identified as this species was reported from Barbados, Antigua, Venezuela and Guyana, and was exported to Mauritius to aid in the control of root-feeding grubs on sugar cane. Since *T. parallela* was described from a single female specimen taken at Teffé, far up the Amazon, in a Tiphine fauna not continued into the countries to the north or west, it is most unlikely that it occurs nat-

urally in the West Indies (Allen 1970). Unfortunately the species is based on a single female which possesses no outstanding characters. As previously shown by Allen, *T. gaumeri* Cameron from Mexico is a valid species not synonymous with *T. parallela*.

FEMALE.—Front with coarse punctures on upper half, chiefly of second-degree density, without interspaces as wide as an ocellus.

Dorsal pronotum with its transverse carina reduced to an obscure, crenulated ridge. Lateral pronotum with aciculations in ventral corner and a fairly distinct narrow groove across half the disc. Scutum with anteromedian escarpment and notaulices not continuous. Legs black. Hind tibia with ridge on inner face, sensorium very small and concolorous with surrounding area. Hind basitarsus not grooved. Tegula translucent piceous without shagreening or marginal grooves. Forewing strongly infumate; radial cell with outwardly directed stump at its apex, 3.9 times as long as wide; cubitus with very long terminal spur.

Areola of dorsal propodeum with parallel sides, less than twice as long as wide, median carina expanded. Tergum 1 without anterior transverse carina; preapical band on middle three-fifths an irregular single row of slightly impressed punctures. Pygidium finely rugose punctate on basal three-fifths; apex wrinkled and part near punctures obscurely shagreened.

Length 12 mm.

MALE.—Unknown.

Known only from the type specimen in the British Museum from Teffé, Brazil.

Peru-Ecuador-Bolivia Area

Key to Males: Peru-Ecuador-Bolivia Area

- | | |
|--|--|
| 1. Very slender species; first tergum 1.6 times as long as wide | 34. <i>T. hodgesi</i> , new species |
| Not usually slender species, tergum 1 at most only slightly longer than wide | 2 |
| 2. Tergum 1 without anterior transverse carina | 3 |
| Tergum 1 with anterior transverse carina | 7 |
| 3. Radial cell greatly exceeding second cubital cell in lateral extension | 4 |
| Radial cell at most only slightly exceeding second cubital cell in lateral extension | 5 |
| 4. Buttressing ridges of transverse carina of dorsal pronotum long and massive | 35. <i>T. pallisteri</i> , new species |
| Buttressing ridges of transverse carina of dorsal pronotum short and vestigial | 36. <i>T. penai</i> , new species |
| 5. Transverse carina of dorsal pronotum buttressed its entire length by strong cross ridges; radial cell about equal to second cubital cell in lateral extension | 37. <i>T. fulvitaris</i> Rohrer |
| Transverse carina of dorsal pronotum at most with only faint buttressing ridges near humeral angle | 6 |

6. Head width 1.8 to 1.9 times least distance between eyes 38. *T. lima* new species
 Head width 2.1 times least distance between eyes 39. *T. pastaza* new species
7. Some of punctures on terga 3 and 4 enlarged and dimpled 8
 None of punctures of terga 3 and 4 enlarged and dimpled 9
8. Transverse carina of tergum 1 high and buttressed; lateral areas of dorsal propodeum coarsely reticulate 40. *T. ancha*, new species
 Transverse carina of tergum 1 faint and rudimentary; lateral areas of dorsal propodeum relatively unsculptured 9
9. Transverse carina of dorsal pronotum buttressed by numerous short cross ridges; vitta of sternum 6 narrow with parallel sides 41. *T. delta*, new species
 Transverse carina of dorsal pronotum not buttressed by cross ridges; vitta of sternum 6 an inverted V bordered by dense bristly hairs 42. *T. cuzcoa*, new species
10. Preapical band of tergum 1 not impressed, broad, about 3 punctures wide; area of dorsal propodeum outside areola not sculptured 43. *T. maria*, new species
 Preapical band of tergum 1 abruptly impressed at least on anterior border; area of dorsal propodeum outside areola coarsely sculptured, with some scalelike shagreening 44. *T. monsona*, new species

Key to Females: Peru-Ecuador-Bolivia Area

1. Basitarsus grooved 2
 Basitarsus not grooved 5
2. Scutum without an anteromedian escarpment 3
 Scutum with an anteromedian escarpment 4
3. Scutum with numerous punctures on anterior half medially arranged as a compact plaque 44. *T. monsona*, new species
 Scutum with only a few punctures on anterior half arranged in V-shaped pattern 21. *T. huallaga*, new species
4. Posterior propodeum with a slender median carina 45. *T. manni*, new species
 Posterior propodeum without trace of median carina 46. *T. browni*, new species
5. Dorsal pronotum with a high, sharp-crested transverse carina buttressed by many prominent cross ridges 47. *T. scalariformis*, new species
 Dorsal pronotum at most with vestigial transverse carina 6
6. Tergum 1 with an anterior transverse carina 7
 Tergum 1 without an anterior transverse carina 10
7. Tergum 1 with transverse carina obscure; notaulices and anteromedian escarpment strongly connected; a conspicuous pit on each side of prosternum 48. *T. quincemila*, new species
 Tergum 1 with transverse carina strong; notaulices and anteromedian escarpment not connected; no pits on side of prosternum 8
8. Tergum 1 with preapical band a single row of punctures 49. *T. iquitosa*, new species
 Tergum 1 with preapical band more than one row of punctures wide 9
9. Punctures of entire front contiguous except for a narrow median vitta; tegula broadly shagreened; rugulae of lateral propodeum strong and widely separated 50. *T. perubra*, new species
 A broad area of upper front with punctures of second- or third-degree density; tegula not shagreened; rugulae of lateral propodeum weak and closely spaced 51. *T. putumayoa*, new species
10. Legs bright red 52. *T. gilvapennis*, new species
 Legs largely black 11
11. Sternum 2 with anteromedian callosity; tegula broadly shagreened 53. *T. academae*, new species
 Sternum 2 without anteromedian callosity; tegula not shagreened 54. *T. bassleri*, new species

21. *Tiphia (Tiphia) huallaga*, new species

FIGURES 16, 17, 49

T. huallaga is known only in the female. It is nearly the largest known species of *Tiphia*, exceeding 20 millimeters in length. The present known distribution from Venezuela to Peru spans two regional areas discussed in this paper. It differs from other species in the Peru-Ecuador-Bolivia area except *T. monsona* in having a complete anterior transverse carina on the dorsal pronotum, no anterior escarpment on the scutum, and a grooved hind basitarsus. It is much larger than *T. monsona*, has a V-shaped configuration of the punctures on the scutum, a much less prominent carina on the dorsal pronotum, and has numerous broadly dispersed punctures on the lower part of the lateral propodeum.

HOLOTYPE.—♀; Upper Rio Huallaga, Peru, 29-X-1925, F6141 (H. Bassleri) (UK).

FEMALE.—Front with contiguous punctures to above level of lowest ocellus. Mandible with apex slenderly tapered.

Dorsal pronotum with anterior transverse carina complete, high and regular; uniformly coarsely and closely punctate on anterior half. Lateral pronotum without groove across disc. Scutum (Figure 16) without anteromedian escarpment, or dense median patch of punctures, anterior half impunctate except for a V-shaped configuration of punctures. Mesopleuron on anterior aspect densely close punctate with punctures of first- or second-degree density, larger secondaries numerous and not sharply distinguished from the primaries; subtegular patch of dense micropunctures absent. Legs entirely black. Hind tibia with inner face not angular in cross section without ridge or naked stripe on inner face; sensorial area concave, pyriform, more than twice as long as wide and as wide as proximal part of basitarsus. Hind basitarsus grooved. Tegula not shagreened and without groove on outer margin. Forewing (Figure 49) densely infumate; stigma separated by more than its length from basal vein; radius terminating in an outwardly directed stump; radial cell elongate, being 4.1 times as long as wide; area of first cubital cell 18 times that of stigma.

Dorsal propodeum with sides of areola slightly concave, its apex wider than its base, and its length more than 3 times its apical width. Lateral propodeum (Figure 17) on upper part with fine, more or less evanescent and closely spaced rugulae; lower part entirely and densely microsetulose, with many widely separated

punctures. First tergum 0.85 times as long as wide; without transverse carina or patch of micropunctures on anterior face; preapical band not impressed and consisting of an irregular array of fine, well-separated punctures, 1 to 2 punctures wide. Sternum 2 with an obscure anteromedian callosity. Intermediate terga dorsally with exceptionally fine punctures concentrated in front of and behind broad impunctate spaces. Pygidium rugose-punctate on basal half; impunctate apex wrinkled and obscurely shagreened to near apex.

Length 18.3 to 21.3 mm.

MALE.—Unknown.

PARATYPES.—1; "Anduze" Venezuela (CU). 1; Colombia (Moritz) 6142 (ZMB).

34. *Tiphia (Tiphia) hodgesi*, new species

FIGURE 18

The unusual slenderness of this species serves to separate it at once from all other males of the Peru-Ecuador-Bolivia area. Aside from its extreme slenderness all other characters appear typical of the genus *Tiphia*. Two other very slender species are known in the South American fauna. One is *T. elongata* described from a single female from southern Brazil many hundreds of miles from the type locality of *T. hodgesi*, and not likely to be conspecific. The other is *T. nariensis*, described from a male from Colombia which is as strikingly slender as *T. hodgesi* but differs in numerous outstanding characters. The single specimen representing *T. hodgesi* lacks tarsi on one middle and both hind legs, and also the femur and tibia of the left hind leg. However, the significant diagnostic characters are present.

HOLOTYPE.—♂; 12 km. west of Al'oag, Pichincha Province, Ecuador, 10,500 ft. (3200 m), 2-II-1958 (R. H. Hodges) (CU).

MALE.—Front with punctures on lower half very small and closely contiguous, on upper half abruptly much larger, of first- or second-degree density without interspaces as wide as an ocellus. Head width 1.7 times least distance between eyes. Cheek much wider than an antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with sharp-crested carina bordered by shallow sulcus and buttressed its entire length by inconspicuous cross ridges, punctate part with moderate-sized punctures regularly distributed, the intervals ranging from less than to slightly more than an

average puncture diameter. Lateral pronotum broadly coarse rugose, without a well-developed discal groove. Mesopleuron on anterior face with very small primary punctures separated in one or more directions by several times an average puncture diameter; everywhere interspersed with secondaries that are more numerous than primaries; subtegular patch of dense microsetae at least anteriorly much wider than tegula. Legs entirely black and exceptionally slender; hind tibia 5 times as long as greatest width without trace of ridge or sensorial area on inner face. Tegula glossy, without shagreening or marginal grooves. Forewing with its membrane hyaline; radial cell exceeded in lateral extension by second cubital cell; second cubital cell unusually large, its sectors in terms of inner sector (itob) are 10:32:20:27.

Propodeum very long, from base of areola to apex of posterior slope 1.2 times as long as greatest width. Dorsal propodeum including areola completely and deeply reticulate; areola about half as wide at apex as at base and 3 times as long as apical width. Lateral propodeum on upper part with rugulae obsolete on caudal two-fifths. First abdominal segment (Figure 18) extremely slender, (as measured on sternum) 1.5 times as long as wide. Tergum 1 without transverse carina; preapical band not abruptly impressed and consisting of punctures of first-degree density and about 3 punctures wide. Terga 3 to 6 strongly shagreened with golden bristles; punctures small, shallow, relatively sparse, and not varying greatly in size or distribution. Sternum 5 without lateral denticle.

Length 10.4 mm.

FEMALE.—Unknown.

35. *Tiphia (Tiphia) pallisteri*, new species

FIGURE 19

There are only a few male *Tiphia* from the Peru-Ecuador-Bolivia area in which there is no anterior transverse carina of the first tergum. Two of these, *T. pallisteri* and *T. penai*, have the radial cell greatly exceeding the second cubital cell in lateral extension. *T. pallisteri* differs from *T. penai* in having long, high ridges buttressing the transverse carina of the dorsal pronotum, in strongly reticulate lateral areas of the dorsal propodeum and in possessing a lateral denticle on sternum 5.

HOLOTYPE.—♂; Moyobamba, San Martin, Peru, 1,800 ft. (550 m), 19-XII-1946 (J. C. Pallister) (AMNH).

MALE.—Front with punctures largely of second-degree density with polished impunctate interspaces twice as wide as an ocellus. Head 2.1 times as wide as least distance between eyes. Cheek slightly wider than an antennal fossa. Mandible without preapical denticle.

Dorsal pronotum (Figure 19) with transverse carina exceptionally high, and buttressed by a complete transverse series of long, high cross ridges, primary punctures reduced to about 20 and these are chiefly on the sides. Lateral pronotum conspicuously dished with a broad polished area at its center. Mesopleuron with conspicuous scalariform prepectal ridge; upper anterior slope with a total of less than 10 large primary punctures located near the suture and about an equal number of small, widely separated ones near crest of slope. Legs black. Hind tibia with a longitudinal ridge on inner face; no apparent sensorium. Tegula without shagreening or groove on outer margin. Forewing with membrane moderately infumate; radial cell greatly exceeding second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:22:17:18.

Dorsal propodeum rugulose to reticulate both on lateral discs and within areola; areola rectangular, almost twice as long as wide; posterior aspect of propodeum moderately reticulopunctate. Tergum 1 without anterior transverse carina; dorsum broadly and very coarsely punctate; preapical band abruptly impressed only on anterior border and consisting of a row of coarse, elongate, irregularly-shaped punctures separated by much less than their average diameter. Terga 3 and 4 with punctures relatively sparse, moderately coarse, and relatively uniform in size and distribution; intermediate terga without microscopic apical grooves in middle area. Sternum 5 with a small, appressed lateral denticle.

Length 5.2 mm.

FEMALE.—Unknown.

36. *Tiphia (Tiphia) penai*, new species

I have seen only 2 species of males from the Peru-Ecuador-Bolivia area in which there is no transverse carina on the anterior dorsum of the first tergum and in which the radial cell greatly exceeds the second cubital and in lateral extension. *T. penai* differs from *T. pallisteri* in lacking the strong buttressing rugulae of the dorsal pronotum, coarse punctures on the medial part of tergum 1, and in having a smooth dorsal

pronotum free of reticulations lateral to the areola. It is known only from the holotype male.

HOLOTYPE.—Avispas, 156 km from Puerto Maldonado, Madre de Dios, Peru, 10/30-IX-1962 (L. E. Pena) (AMNH).

MALE.—Front with punctures relatively sparse on upper two-thirds where they are of third-degree density except narrowly beside eyes, with impunctate interspaces as wide as an ocellus, without secondaries. Head 2.3 times as wide as least distance between eyes. Cheek slightly narrower than an antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with its transverse carina bordered by a shallow sulcus and buttressed by only obscure cross ridges, punctures very small, uniformly distributed and separated everywhere by several times their average diameter. Lateral pronotum without groove or escarpment across disc. Mesopleuron on anterior slope with only a few small punctures separated in most directions by many times their average diameter. Legs black. Tibia on inner face with no trace of a carina; sensorium reduced to an obscure papilla. Tegula not shagreened and without marginal groove on outer margin. Forewing with radial cell greatly exceeding second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:26:16:19.

Dorsal propodeum with lateral discs smooth, glossy; areola long, slender, with strongly converging, concave sides, length about 3 times apical width. Tergum 1 without anterior transverse carina; preapical band abruptly depressed only on anterior border and consisting of a single row of coarse punctures. Terga 3 with some punctures shallow, moderately enlarged, dimpled, terga 4 and 5 without enlarged and dimpled punctures; terga 3, 4, and 5 each with microscopic apical groove. Sternum 5 with preapical denticles.

Length 6.2 mm.

FEMALE.—Unknown.

37. *Tiphia (Tiphia) fulvitaris* Rohwer

Tiphia fulvitaris Rohwer, 1912; 454.

This species has been redescribed from the type kindly lent by the United States National Museum, and from several identified specimens from Peru. Among the 3 species of male *Tiphia* from the Peru-Ecuador-Bolivia area in which there is no transverse carina on the first tergum, and the radial cell at most only slightly ex-

ceeds the second cubital cell in lateral extension, *T. fulvitaris* can be immediately distinguished by the presence of a heavily buttressed transverse carina on the dorsal pronotum. Its cheek is narrower than that of *T. lima* and unlike *T. lima* and *T. pastaza* its legs are broadly infused with red. I have redescribed it from the holotype and several identified males from Peru.

HOLOTYPE.—♂; Piura, Peru, 1-XI-1910 (C. H. T. Townsend) (USNM Type No. 14142).

MALE.—Front on upper half with punctures ranging from first-degree density at sides to third-degree medially; with numerous secondaries on lower half. Head width 2.2 times least distance between eyes (3 measured were 2.1, 2.2, 2.2). Cheek as wide as antennal fossa. Mandible without preapical cusp.

Dorsal pronotum with high transverse carina supported its entire length by many strong buttressing ridges; punctures of moderate size and fairly uniform in size and distribution. Lateral pronotum sometimes with obscure transverse escarpment. Mesopleuron with punctures on outer disc smaller and more widely spaced than those in front, of third-degree density; minute secondaries about as numerous as primaries. All tarsi and tibiae except on outer face of hind tibia are yellowish red. Tegula with a very fine groove about outer apical margin. Forewing with membrane nearly hyaline; radial cell slightly exceeding second cubital in lateral extension.

Dorsal propodeum with area lateral to areola smooth; areola keystone-shaped, only slightly longer than basal width, base about one and one-eighth times apical width. Tergum 1 without anterior transverse carina; preapical, band in shallow groove and consisting of a single row of coarse, discrete punctures. Intermediate terga with punctures relatively fine, numerous, and relatively uniform in size and distribution; no microscopic apical grooves over middles of terga. Sternum 5 without lateral denticle.

Length 4.9 to 6.0 mm.

FEMALE.—Unknown.

Identified specimens are as follows:

1; 5 miles south of Chiclayo, Lambayeque, Peru, 20 m, 17-I-1955 (E. I. Schlinger and E. S. Ross) (CAS). 1; Pacasmayo, Peru, corn field, 9-XII-1930 (H. A. Jaynes) (USNM). 1; Talara, Peru, 27-VII-1952, Coralvine (A. Fischer) (UK).

38. *Tiphia (Tiphia) lima*, new species

There are only a few male *Tiphia* from the Peru-Ecuador-Bolivia area in which there is no anterior transverse carina on the first tergum. Two of these, *T. pallisteri* and *T. penai*, have a radial cell greatly exceeding second cubital cell in lateral extension. *T. lima* differs from *T. pastaza* in having a cheek wider than the antennal fossa; a radial cell exceeded by the second cubital cell in lateral extension; in its keystone-shaped areola with straight sides, and apex much narrower than base; and in the preapical band of tergum 1 which consists of very fine, closely spaced punctures. The type series consists of the type and one paratype taken in different localities.

HOLOTYPE.—♂; Lima, Peru, 2-V-1920. Cornell University Expedition Lot 607 (CU).

MALE.—Front with punctures generally of first-degree density except for a small narrow vitta below middle ocellus, a few secondaries extending into lower half. Head width 1.9 times least distance between eyes. Cheek wider than an antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with transverse carina high, sharp-crested, buttressed only obscurely at humeral angle; punctate part with primaries of moderate size and generally of first-degree density. Lateral pronotum flat, without groove or escarpment across its disc. Mesopleuron on anterior slope with small primary punctures generally of second- or third-degree and minute secondaries everywhere much more numerous than the primaries; with subtegular patch of dense microsetae almost as wide as tegula. Hind tibia with a long, strong carina on inner face. Tegula not shagreened and without marginal grooves. Forewing with its radial cell slightly exceeded in lateral extension by second cubital cell; area of second cubital cell almost equal to that of first cubital cell; sectors of second cubital cell in terms of inner sector (itob) are 10:25:20:25.

Dorsal propodeum on lateral discs only slightly roughened; areola strongly tapered, its sides slightly incurved at base, slightly longer than basal width and about twice as long as apical width. Tergum 1 without anterior transverse carina; preapical band a single regular row of minute, closely spaced punctures at bottom of broad V-shaped depression. Intermediate terga of moderately large punctures relatively uniform in size and distribution; apices without microscopic grooves over middles. Sternum 5 without lateral denticles.

Length 7.4 mm.

FEMALE.—Unknown.

PARATYPE.—1; Chancay, Peru, river valley, 15-III-1951 (Ross & Michelbacher) (CAS).

39. *Tiphia (Tiphia) pastaza*, new species

In the key, *T. pastaza* is grouped with 2 other species having no traces of transverse carina on the first tergum, and a radial cell at most only slightly exceeding the second cubital cell. In *T. pastaza* the distance between the eyes is less than in *T. lima*, and the cross ridges buttressing the transverse carina of the pronotum are much weaker than those of *T. fulvitaris*. In *T. pastaza* the area covered by contiguous punctures includes the entire front, but on *T. fulvitaris* it is somewhat less than that. *T. pastaza* is known only from the holotype.

HOLOTYPE.—♂; Rio Pastaza, Ecuador, 19-III-1939 (F. M. Brown) (AMNH).

MALE.—Front completely set with coarse, contiguous punctures; without secondaries. Head width 2.1 times least distance between eyes. Cheek slightly narrower than antennal fossa. Clypeal extension almost truncate. Mandible without preapical denticle.

Dorsal pronotum with a high, sharp-crested transverse carina bordered by a deep sulcus which is crossed by a few weak ridges; with coarse punctures of first-degree density laterally and third-degree apicomedialely. Lateral pronotum with anterior process sharp-crested to ventral terminus; without well-defined groove across middle disc. Mesopleuron on anterior slope away from prepectal area with small primary punctures separated in one or more directions by much more than average diameter; secondaries minute and everywhere much more numerous than the primaries; subtegular patch of microsetae not well-defined. Legs black. Hind tibia on inner face obscurely carinate. Tegula without shagreening, or groove on outer margin. Forewing with radial cell slightly exceeding second cubital in lateral extension, with a sharp bend in apical section. Sectors of second cubital cell in terms of inner sector (itob) are 10:31:19:24.

Dorsal propodeum with surface not coarsely sculptured; areola with concave sides and apex nearly as wide as base, about twice as long as apical width. Lateral propodeum on upper part with several strong, widely separated rugulae. First abdominal segment unusually elongate, 1.1 times as long as wide. Tergum

1 without anterior transverse carina; preapical band a single row of large punctures ranging from widely separated to coalesced, in a narrow depression with anterior margin much higher. Terga 2, 3, and 4 with moderately enlarged, dimpled punctures much larger and less numerous than those on anterior part of the segments, terga 3 and 4 terminating an obscure apical row of small punctures. Sternum 5 without lateral denticle.

Length 9.6 mm.

FEMALE.—Unknown.

40. *Tiphia (Tiphia) ancha*, new species

FIGURE 20

T. ancha was described from the holotype specimen. In the key to males from the Peru-Ecuador-Bolivia area the presence of an anterior transverse carina on the first tergum, and conspicuously enlarged, dimpled punctures on the intermediate terga place it in couplet with *T. delta*. In *T. ancha* the first tergal carina is high, complete, and buttressed, while in *T. delta* it is somewhat obscure and rudimentary.

HOLOTYPE.—♂; "Cl. Anchamayo," Peru, (Rosenberg) (USNM).

MALE.—Entire front with primary punctures coarse and contiguous except for small area below ocellar triangle and about as large; secondaries scarce. Head width 2.1 times least distance between eyes. Cheek about as wide as antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with high sharp-crested transverse carina; bordering sulcus crossed for its entire length by prominent cross ridges; punctate part includes all of sclerite except a narrow apical fringe, the posterior punctures larger and more widely separated than those bordering sulcus. Lateral pronotum aciculate, with a broad gouge in middle area which is crossed by a decreasing series of rugulae. Mesopleuron on upper part of anterior slope with small primary punctures separated in most directions by much more than their average diameter; secondaries minute and not numerous; without subtegular patch of microsetae. Legs black. Hind tibia on inner face strongly ridged. Tegula glossy without groove on outer margin. Forewing with membrane moderately infumated, radial cell in lateral extension greatly exceeds second cubital cell; sectors of second cubital cell in terms of inner sector (itob) are 10:26:20:21.

Dorsal propodeum with its lateral discs and areola coarsely and strongly reticulate; areola nearly rectangular, about one and one-fourth times as long as wide. Tergum 1 (Figure 20) with a high transverse carina buttressed by a complete series of cross ridges; preapical band one irregular row of coarse, coalesced punctures in a narrow trench. Terga 2 to 5 with enlarged, dimpled punctures lying between an anterior band and a posterior row of much smaller ones, none of the enlarged dimpled punctures arranged in transverse rows. Sternum 5 without lateral denticles.

Length. 8.0 mm.

FEMALE.—Unknown.

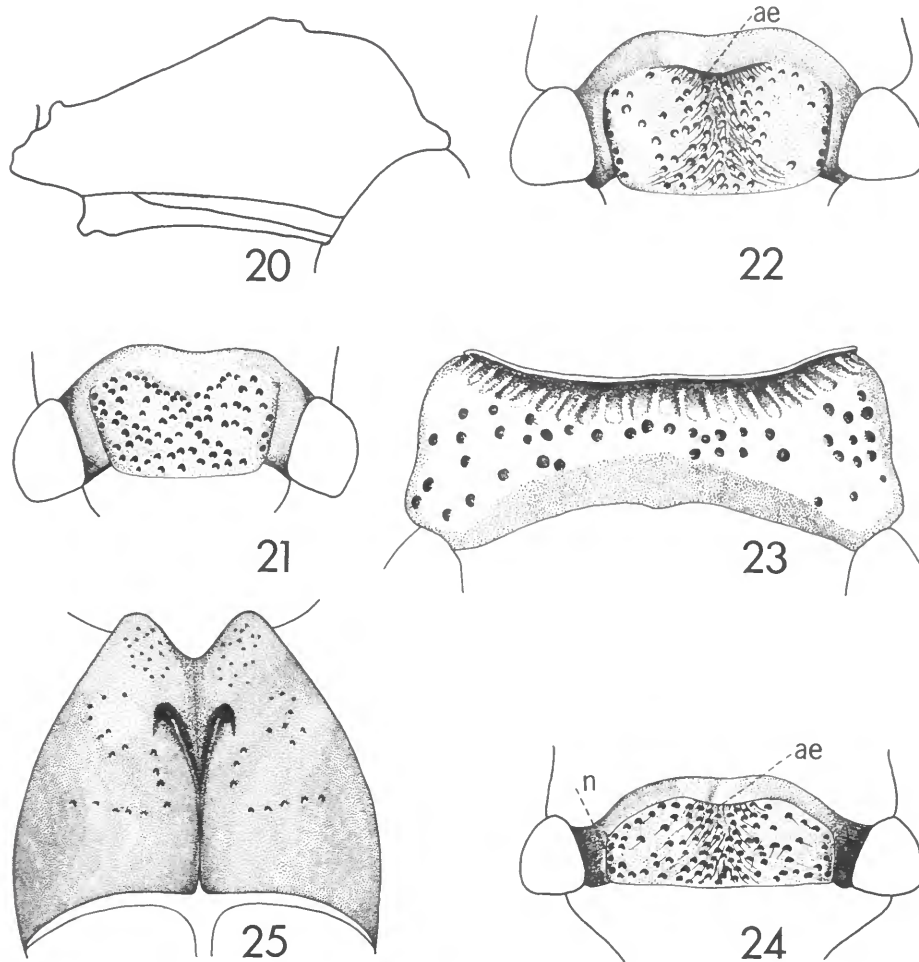
41. *Tiphia (Tiphia) delta*, new species

This species was described from 2 specimens taken at the same locality but on different dates. The paratype has a preapical mandibular denticle which is much smaller than that of the holotype. *T. delta* runs in the key to the same couplet as *T. ancha*, and like it has a transverse carina on the first tergum, a much elongated radial cell, and enlarged, dimpled punctures on the intermediate terga. It differs in having the dorsal propodeum free of reticulations, and in possessing a more rudimentary transverse carina on the first tergum.

HOLOTYPE.—♂; Monson Valley, Tingo Maria, Peru, 23-IX-1954 (E. I. Schlinger and E. S. Ross) (CAS).

MALE.—Front with punctures coarse and deep, on upper half largely of second-degree density; without secondaries above lower third. Head width 2.2 times least distance between eyes (2 measured were 2.2, 2.3). Cheek narrower than an antennal fossa. Mandible with preapical denticle.

Dorsal pronotum with a high-crested transverse carina buttressed by a complete series of strong ridges; punctures coarse and ranging from first- to third-degree density. Lateral pronotum flat with irregular aciculations in ventral corner bounded above by a crescent-shaped escarpment. Mesopleuron on outer aspect of anterior slope with moderate-sized punctures of second- or third-degree density, mixed with minute secondaries which are somewhat more numerous than the primaries; subtegular area with dense micropunctures which extend down along prepectus to its angle. Legs entirely black. Hind tibia on inner face with an elongate ridge. Tegula not shagreened, without groove



FIGURES 20-25.—20, Male of *Tiphia ancha*, new species, from Anchamayo, Peru, showing lateral outline of tergum 1. 21, female of *Tiphia monsona*, new species, from Monson Valley, Peru, showing absence of anteromedian escarpment. 22, female of *Tiphia browni*, new species, from Rio Pastaza, Ecuador, dorsal scutum showing anteromedian escarpment. 23, female of *Tiphia scalariformis* from Monson Valley, Peru, showing heavily buttressed transverse carina of dorsal pronotum. 24-25, female of *Tiphia quincemila* from Quincemil, Peru: 24, scutum showing anteromedian escarpment and notaulices connected; 25, prosternum showing pits near median line. (*ae*=anteromedian escarpment, *n*=notaulice.)

on outer margin. Forewing with its membrane slightly infumate; radial cell in lateral extension greatly exceeding second cubital cell; sectors of second cubital cell in terms of inner sector (*itob*) are 10:33:20:26.

Dorsal propodeum lateral to areola largely polished without sculpturing; areola rectangular about one and

one-half times as long as apical width. Tergum 1 with a short, obscure, rudimentary transverse carina; pre-apical band in a narrow groove and consisting of coarse punctures separated by much less than their average diameter. Intermediate terga, particularly terga 3 and 4 with punctures varying greatly in size, the

largest being dimpled and as much as a fifth or a sixth as wide as the abdominal segment. Sternum 5 without lateral denticles.

Length 6.5 to 7.3 mm.

FEMALE.—Unknown.

PARATYPE.—1; collected 21-X-1954, other data same as holotype. (CAS).

42. *Tiphia (Tiphia) cuzcoa*, new species

T. cuzcoa known only from holotype specimen taken at Machu Picchu, presumably close to 20,000 feet (6,100 m) elevation, and far higher than the previous highest altitudes I have seen recorded. It runs in the key to the couplet with *T. delta*. Both have an obscure and rudimentary anterior transverse carina on the first tergum as well as an absence of enlarged punctures on the intermediate terga. *T. cuzcoa* differs from *T. delta* in not having a conspicuous scalariform sulcus on the dorsal pronotum, or an escarpment across the middle disc of the lateral pronotum, but possessing a broadly V-shaped vitta on the sixth sternum which is bordered by a coarse, half-erect brush of bristly hairs.

HOLOTYPE.—♂; Machu Picchu, Cuzco, Peru, 1-II-1964, (USNM).

MALE.—Front with punctures contiguous on lower half and along eyes, thinning in area below ocellar triangle to second- or third-degree density without interspaces as wide as an ocellus; secondaries numerous on lower half. Head width 2.3 times as great at least distance between eyes. Cheek slightly narrower than antennal fossa. Mandible without well-defined preapical cusp.

Dorsal pronotum with its transverse carina high and sharp-crested but nowhere buttressed by short ridges; punctures coarse and of uniform size, ranging uniformly from first-degree density anteromedially to third- or second-degree on lateral discs. Lateral pronotum without groove or escarpment across middle disc. Mesopleuron with coarse punctures ranging from first-degree density near prepectal ridge to third-degree on small area of outer disc; plaque of dense micropunctures scarcely as wide as tegula in area next to it but extending in thinning array along prepectus to below its angle. Hind tibia narrowly carinate on inner face, scarcely expanded about minute, slitlike sensorium. Tegula not shagreened; without groove on outer margin. Forewing with membrane heavily infumate; radial cell greatly exceeding second cubital cell in lateral

extension; sectors of second cubital cell in terms of inner sector (itob) are 10:29:16:23.

Dorsal propodeum with area lateral to propodeum strongly aciculate, without coarse sculpturing; areola slightly tapered; more than twice as long as apical width, with complete median carina. Lateral propodeum on upper part with rugulae numerous and closely spaced. Tergum 1 of more than normal length, about 1.1 times as long as wide; with an obscure crooked anterior transverse carina confined to middle disc; preapical band a single row of coarse, coalesced punctures sharply impressed but without a bordering anterior escarpment. Intermediate terga very coarsely punctate with some of the punctures of terga 3, 4, and 5 enlarged and dimpled. Sternum 5 without lateral denticle. Sternum 6 with impunctate vitta an inverted V-shaped terminal expansion, bordered with semi-erect coarse, brown, bristly hairs.

Length 10.4 mm.

FEMALE.—Unknown.

43. *Tiphia (Tiphia) maria*, new species

T. maria is known only from the holotype male. Because of the transverse carina on tergum 1, the lack of enlarged and dimpled punctures on the intermediate terga, it runs to the same couplet in the key to males of the Peru-Ecuador-Bolivia area as *T. monsonia*. It differs from that species in many characters including the lack of a transverse carina on the back edge of the vertex, a more diffuse dispersion of punctures on the upper front, the smoother dorsal propodeum, and the more slender apical cell.

HOLOTYPE.—♂; Monson Valley, Tingo Maria, Peru, 11-XII-1954 (E. I. Schlinger and E. S. Ross) (CAS).

MALE.—Front with punctures of first-degree density on lower third and bordering eyes to level of lowest ocellus, upper middle of third-degree density without spaces as wide as an ocellus. Head width 2.2 times least distance between eyes. Cheek about as wide as an antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with a high, sharp-crested transverse carina; bordering sulcus with a few obscure cross ridges; punctures of uniform size and distribution, generally of third-degree density. Lateral pronotum without escarpment across middle disc. Mesopleuron with small primary punctures generally of third-degree

density, with very numerous fine, very long microsetae on most of anterior slope above middle and continuous over subtegular area. Legs black. Hind tibia without carina on inner face. Tegula shagreened on outer slope, without groove on outer margin. Forewing with slightly infumate membrane; radial cell 3.2 times as long as wide and greatly exceeding second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:29:16:21.

Dorsal propodeum polished except for faint aciculations; areola widest near base, its length 2 times and its base about one and two-thirds apical width. Tergum 1 with a faint transverse carina; preapical band not impressed and consisting of punctures separated by less than their average diameter and 2 to 3 punctures wide. Abdominal terga with punctures relatively uniform in size and distribution; apices over middles without microgrooves. Sternum 5 without lateral denticle.

Length 9.9 mm.

FEMALE.—Unknown.

44. *Tiphia (Tiphia) monsona*, new species

FIGURES 21, 50

T. monsona belongs to a small group from the Peru-Ecuador-Bolivia area in which the male has a strong anterior transverse carina on the first tergum, and the radial cell of the forewing greatly exceeds the second cubital cell in lateral extension. It is coupled in the key with *T. maria* from which it can be readily distinguished by the peculiar carina on the posterior edge of the front, the presence of an anterior escarpment to the preapical band of the first tergum, and the peculiar shagreening resembling fish scales on the dorsal propodeum. A female, apparently the same species, was taken at the same time and place as the holotype.

The female is one of only 2 species from the Peru-Ecuador-Bolivia area which possesses a groove on the hind basitarsus and no anteromedian escarpment on the scutum. *T. monsona* is a much smaller species than the exceptionally large *T. huallaga*, it has a strong transverse pronotal carina lacking in *T. huallaga*, the median plaque of punctures on the scutum is farther forward and lacks the forward diverging arms, and the first tergum of the abdomen is not as elongate.

HOLOTYPE.—♂; Monson Valley, Tingo Maria, Peru, 2-XII-1954 (E. I. Schlinger and E. S. Ross) (CAS).

MALE.—Vertex outlined caudally with a distinct transverse ridge. Front with punctures of first-degree density on lower half and along eyes to level of lowest ocellus, on upper half medially of second-degree density without interspaces as wide as an ocellus; secondaries numerous on lower half. Antennal flagellum slender, 1.35 times head width. Head width 2.2 times least distance between eyes (4 measured were 2.1, 2.2, 2.2, 2.1). Cheek almost as wide as antennal fossa. Clypeal extension bilobate. Mandible without well-defined denticle.

Dorsal pronotum with a sharp, high carina buttressed by numerous strong cross ridges. Lateral pronotum with anterior process carinate near humeral angle but broadly rounded at ventral corner; with only short fine rugulae at ventral corner and a conspicuous lanceolate or crescent-shaped depression on disc. Mesopleuron on outer disc with coarse punctures separated in some directions by less than their average diameter, becoming much coarser and denser at prepectal angle; secondaries minute, sparse. Hind tibia with well defined ridge on inner face. Tegula polished without groove on outer margin. Forewing with membrane faintly infumate and densely set with microsetae; lateral extension of radial cell greatly exceeding that of second cubital cell; sectors of second cubital cell in terms of inner sector (itob) are 10:28:20:19.

Dorsal propodeum with strong buttressed ridges arising from the areola and posterior transverse carina, lateral area with conspicuous fishscale-like shagreening; areola almost rectangular, only slightly longer than broad. Tergum 1 with high, complete transverse carina buttressed with many short, strong ridges; preapical band consists of coarse, coalesced row of punctures deeply impressed and bordered by an escarpment, and an irregular row of well-separated punctures not impressed. Intermediate terga polished, with shallow punctures among which none are greatly enlarged; with no microscopic apical groove over middles. Sternum 5 without lateral denticle.

Length 6.4 mm.

ALLOTYPE.—♀; same data as holotype (CAS).

FEMALE.—Front with punctures very coarse and closely contiguous from eye to eye above level of lowest ocellus.

Dorsal pronotum with punctuate part also everywhere set with coarse, closely contiguous punctures; transverse carina unusually high and sharp-crested; buttressed by many short ridges; lateral pronotum ex-

tensively bipunctate on upper half, irregularly aciculate in ventral corner. Scutum (Figure 21) without an anteromedian escarpment, but with an anteromedian cluster of coarse punctures of first-degree density. Mesopleuron broadly shagreened; anterior slope with coarse punctures, generally of first-degree density, without secondaries; subtegular patch of microsetae as broad as tegula. Hind tibia with upper margin not arched, slightly angular in cross section; sensorium small, elongate ovate, flush with surrounding area. Hind basitarsus grooved. Tegula broadly and conspicuously shagreened, without groove on outer margin. Forewing (Figure 50) strongly infumate with stigma separated by less than its length from basal vein; radius with first section sharply bent, terminating (one wing only) in an outwardly directed spur; area of first cubital cell 10.0 times that of stigma.

Dorsal propodeum broadly coriaceous; areola rectangular and not more than one and one-half times as long as wide. Lateral propodeum on upper half with rugulae of medium height and spacing; lower part broadly aciculate, with microsetae present over much of area but fine and inconspicuous. Tergum 1 without transverse carina; 0.6 times as long as wide, dorsal area entirely irregularly punctate with preapical band not impressed and poorly defined; about 3 punctures wide. Terga 3 and 4 with punctures varying only moderately in size, surrounding poorly defined and nearly impunctate areas; terga 3, 4, and 5 each with a clearly defined apical row of microscopic gouges over middle. Pygidium coarsely and closely rugulose on basal three-fifths; impunctate apex not shagreened.

Length 11.3 mm.

PARATYPES.—1 ♂; collected 10-XII-1954, other data as for holotype (CAS). 1 ♂; Tingo Maria, Huanuco, Peru, 2,200 ft. (670 m), 12-X-1945 (J. C. Pallister) (AMNH). 1 ♂; "Avispas," 156 km from Puerto Maldonado, Madre de Dios, Peru, 1/15-X-1962 (L. E. Pena) (AMNH).

45. *Tiphia (Tiphia) manni*, new species

T. manni is known only from the holotype specimen. It is not a sharply defined species. Its chief distinguishing characters are the grooved hind basitarsus, a complete pronotal carina, a large mat of microsetae on the lower propodeum, an absence of a median callosity on sternum 2, and presence of a narrow median carina on posterior propodeum.

HOLOTYPE.—♀; Tumupasa, Bolivia, December 1921. (W. M. Mann) (USNM).

FEMALE.—Front very coarsely punctate with punctures of first-degree density except for a narrow, irregular median vitta.

Dorsal pronotum with low, complete transverse carina; punctures coarse, of uniform size and distribution and of first-degree density. Lateral pronotum with numerous well-developed rugulae in ventral corner. Scutum with anteromedian escarpment, and median patch of coarse punctures of first-degree density; notaulices and escarpment not connected. Mesopleuron on anterior slope with principal punctures generally of third-degree density with coarse secondaries less numerous than primaries; subtegular area of dense microsetae as wide as tegula. Legs black. Hind femur moderately stout, 1.7 times as long as wide. Hind tibia on inner face with strong ridge; sensorium black, concolorous with surrounding area, at least twice as long as wide and about a fourth width of joint. Hind basitarsus with groove. Tegula not shagreened, and without groove on outer margin. Forewing strongly infuscated; stigma separated by a distance equal to its length from basal vein; radius with a rudimentary spur on its first section, and terminating in a very short outwardly directed spur; area of first cubital cell 25.0 times that of stigma.

Dorsal propodeum largely glossy; areola with concave sides, about two and one-half times as long as apical width; lateral propodeum on upper half with many closely spaced rugulae; lower half completely covered with a conspicuous mat of dense microsetae; posterior propodeum with a linear median carina on lower half. Tergum 1 with preapical band of small punctures irregularly and widely dispersed and not impressed. Sternum 2 without median callosity. Terga 3 and 4 with large impunctate areas between anterior and posterior concentrations of punctures. Pygidium rugose punctate on basal two-thirds; apex faintly shagreened at juncture with punctate part.

Length 14.6 mm.

MALE.—Unknown.

46. *Tiphia (Tiphia) browni*, new species

FIGURES 22, 51

T. browni belongs to a small group in which the female has a grooved hind basitarsus. There are few distinctive features. The hind tibia has a very small,

nearly round, white sensorium which is scarcely one-eighth the width of the joint, and the micropile of the lateral propodeum is sparse and inconspicuous. In addition to the holotype, I have seen 4 other specimens taken in 1921-1922 by Dr. Mann in Bolivia which resemble the type of *T. browni* closely but lack the small white spot in the tarsal sensorium. They have been tentatively assigned to this species.

HOLOTYPE.—♀; Rio Pastaza, Ecuador, 19-II-1937 (F. M. Brown) (AMNH).

FEMALE.—Front with coarse punctures, contiguous on lower half and along eyes, of more dispersed first- or second-degree density elsewhere; without interspaces as wide as an ocellus. Mandible normal.

Dorsal pronotum with faint traces of transverse carina on lateral third; punctures coarse and of irregular first-degree density. Lateral pronotum faintly aciculate in ventral corner; without groove across its disc. Scutum (Figure 22) with anteromedian escarpment and notaulices not connected. Mesopleuron on anterior slope with coarse punctures generally of first-degree density; subtegular patch of microsetae about as wide as tegula. Legs entirely black. Hind tibia on inner face with a strong median ridge; a small but distinct ivory-white spot in the sensorial area (both legs). Hind basitarsus grooved. Tegula very faintly shagreened on part of its surface, with faint crease on outer anterior margin. Forewing (Figure 51) with membrane moderately fuscous; stigma separated by more than its length from basal vein; radius with rudimentary spur on its first section, and with outwardly directed terminal spur; first cubital cell 16 times area of stigma.

Dorsal propodeum laterally only faintly etched; areola slightly tapered, not quite 3 times as long as apical width. Lateral propodeum on upper part with rugulae which are coarse and widely separated; lower part broadly fine aciculate with microsetae very fine, short, inconspicuous. Tergum 1 without transverse carina; preapical band slightly impressed and consisting of a single row of moderate-sized punctures, somewhat irregular in size, spacing, and alignment. Terga 3 and 4 with punctures not varying greatly in size and surrounding small, nearly impunctate areas, terminating medially far before apices of segments. Pygidium elongate punctate on basal half, with a median emargination; impunctate apex finely shagreened on at least its basal half; ovipositor valves not shagreened.

Length 9.5 mm.

MALE.—Unknown.

PARATYPES.—3; Cachucia Esperanza, Beni, Bolivia, 1921-1922 (W. M. Mann) (USNM). 1; Riberalta, Bolivia, 1921-1922 (W. M. Mann) (USNM).

47. *Tiphia (Tiphia) scalariformis*, new species

FIGURES 23, 52

The massive transverse carina of the dorsal pronotum is most unusual in females, and the broad polished apical bands on the terga are rarely found among any species of *Tiphia*. This unusual species possesses several characters always found in *Neotiphia* including the wide polished, ribbon-like apices of the terga, the pronotal transverse carina not common in female *Tiphia*, and the strongly concave sensorium of the hind tibia. However, it lacks the elongated mouthparts and the triangular shagreened stripe on the sixth sternum possessed by all described species of *Neotiphia* and in other respects is more like *Tiphia* than *Neotiphia*.

HOLOTYPE.—Monson Valley, Tingo Maria, Peru, 15-X-1954 (E. I. Schlinger and E. S. Ross) (CAS).

FEMALE.—Front broadly shagreened with coarse, shallow punctures generally of first-degree density on lower half, on upper half with a broad middle area of third-degree, but without interspaces as wide as an ocellus. Clypeal extension very narrow and conspicuously bidentate. Mandible with a large, pointed preapical denticle.

Dorsal pronotum (Figure 23) with a high, sharp-crested transverse carina; bordering sulcus conspicuously scalariform for its entire length; punctures of first-degree density, of uniform size and distribution. Lateral pronotum dish-shaped with scanty sculpturing ranging from several round punctures to a few widely separated gouges, with a broad groove across its middle. Scutum, scutellum and metanotum uniformly set with coarse, shallow punctures; scutum without trace of anteromedian escarpment. Mesopleuron on anterior face with shallow, round punctures everywhere of slightly irregular first-degree density; no subtegular patch of dense microsetae. Legs black. Hind tibia on inner face with a strong ridge; sensorium an elongate oval in a shallow pit. Hind basitarsus without groove. Tegula broadly shagreened, without groove on outer margin. Forewing (Figure 52) densely infumate; stigma separated by its length from basal vein; radial cell terminating in a short spur outwardly and upwardly

directed; area of first cubital cell 14.0 times that of stigma.

Dorsal propodeum with areola rectangular, scarcely twice as long as wide. Lateral propodeum on upper part with strong rugulae moderately well separated; lower part with only a few microsetae close to hind coxal cavity. Tergum 1 with a strong transverse carina; preapical band over middle narrowed to a slightly impressed single row irregular in alignment and spacing. Terga 2, 3, and 4 with punctures of moderate size and relatively uniform distribution, but terminating in a close-spaced row forming the anterior border of polished ribbon-like apices. Pygidium finely rugose punctate on basal half with a broad median emargination; impunctate apex faintly shagreened and wrinkled near punctate part. Terminal sternum without shagreened median stripe.

Length 10.9 mm.

MALE.—Unknown.

48. *Tiphia (Tiphia) quincemila*, new species

FIGURES 24, 25, 53

Known only from the holotype specimen. This species while it has the generalized characters of the genus *Tiphia*, also possesses several exceptional characters. Some of these are the unusual pits bordering the prosternum, the polished impunctate bands of the abdominal terga, the golden abdominal bristles, and the narrow impunctate apex of the pygidium.

HOLOTYPE.—♀; Quincemil, on branch of Rio Manu, Madre Dios, Peru, 14/31-VIII-1962 (L. E. Pena) (AMNH).

FEMALE.—Front on upper three-fourths with punctures of third- or second-degree density, with several interspaces wider than an ocellus. Mandible minutely notched near apex.

Dorsal pronotum without transverse carina; punctures of moderate size, generally separated in some directions by more than an average puncture diameter and on lateral discs, in every direction. Lateral pronotum dished, without groove across disc. Ventrally with a large, unusual pit on each side of prosternum (Figure 25). Scutum (Figure 24) with median cluster of close punctures mixed with a few secondaries; notaulices and anteromedian escarpment strongly connected. Mesopleuron on outer disc with a mixture of small primary punctures and large secondaries

separated in most directions by more than an average puncture diameter; punctures much coarser and denser along prepectal ridge. Subtegular patch of dense microsetae as wide as tegula. Legs black and stout. Hind femur 1.7 times as long as wide. Hind tibia on inner face with a strong, complete carina; sensorial area red, nearly half as wide as joint but scarcely longer than wide, shallowly depressed. Hind basitarsus without groove. Tegula without shagreening or marginal grooves. Forewing (Figure 53) with membrane yellowish brown; stigma very small, but separated by only slightly more than its length from basal vein; radius without inwardly directed spur on first section; terminating in an outwardly and anteriorly directed spur; area of the first cubital cell is 32.0 times that of stigma.

Dorsal propodeum on its sides finely shagreened with scattered minute punctures; innermost margin of lateral groove equal to outer carina; areola slightly tapered, its length slightly more than twice apical width. Lateral propodeum on upper part with fine closely spaced rugulae; lower part with microsetae in close mat only on border of hind coxa. Tergum 1 with an obsolete and crooked trace of an anterior transverse carina; preapical band bordered anteriorly by a low escarpment, not otherwise impressed, irregular, 2 to 3 punctures wide medially. Terga and punctate part of pygidium with long, conspicuous, golden bristly hairs, terga 3 to 5 with broad, yellow membranous fringes; terminal punctures scarcely more than their average diameter from non-membranous apices. Pygidium with basal three-fourths coarsely elongate punctate; impunctate apex a narrow wrinkled band of about same width throughout.

Length, 9.5 mm.

MALE.—Unknown.

49. *Tiphia (Tiphia) iquitos*, new species

FIGURE 54

T. iquitos is known only from two specimens. It belongs to the group in which there is no pronotal transverse carina or basitarsal groove but which has an anterior transverse carina on the first tergum. In the key it runs to the same couplet with *T. perubra* from which it differs in having a more sparsely punctate front and a more densely punctate abdomen.

HOLOTYPE.—♀; Iquitos, Peru, 27-VII to 7-VIII, 1920, Cornell University Expedition Lot 569 (CU).

FEMALE.—Front on upper half with very coarse punctures generally of second-degree density without interspaces as wide as an ocellus. Cheek with mat of conspicuous white pile. Mandible without preapical denticle.

Dorsal pronotum without a transverse carina, with punctures coarse, of first-degree density, tending toward contiguous rows. Lateral pronotum with anterior process carinate only at humeral angle; with rugulae in ventral corner and a short, obscure transdiscal groove. Scutum with anteromedian escarpment and median patch of dense, coarse punctures. Mesopleuron on outer disc shagreened, with coarse punctures of first-degree density; subtegular patch of dense microsetae as wide as tegula. Hind tibia on inner face strongly ridged; with sensorium black, stoutly clavate, about a third as wide as joint. Hind basitarsus without groove. Tegula broadly shagreened without groove on outer margin. Forewing (Figure 54) densely infumate; stigma separated by more than its length from basal vein; area of first cubital cell 28.5 times that of stigma.

Areola of dorsal propodeum broadest caudad of base, its length slightly more than twice apical width. Tergum 1 with a strong transverse carina; preapical band not impressed, a single straight row of large punctures separated by less than their average diameter. Terga 4 and 5 medially with coarse punctures relatively uniform in size and distribution. Pygidium finely elongate punctate on basal half; impunctate part shagreened to near apex.

Length 14.8 mm.

MALE.—Unknown.

PARATYPE.—1; Iquitos, Peru, 19-III-1924, F6062 (H. Bassler) (AMNH).

50. *Tiphia (Tiphia) perubra*, new species

This species which possesses a strong transverse carina on the first tergum, and lacks a transverse carina on the dorsal pronotum and a groove on the hind basitarsus, runs in the key to the couplet with *T. iquitosa*. It differs from *T. iquitosa* in having a much more closely punctate front and dorsal pronotum, and a more sparsely punctate abdomen.

HOLOTYPE.—♀; Peru-Brazil frontier, 14-II-1928, F 6007 (H. Bassler) (AMNH).

FEMALE.—Front to level of lowest ocellus with contiguous punctures separated only by narrow ridges.

Cheek with mat of coarse, white hair. Mandible without preapical denticle.

Dorsal pronotum with only trace of transverse carina at humeral angle; punctures everywhere as closely spaced as those of front. Scutum with anteromedian escarpment not connected with notaulices. Mesopleuron broadly shagreened, with coarse punctures of first-degree density; subtegular patch of microsetae as wide as tegula. Hind tibia on inner face strongly ridged. Hind basitarsus without groove. Tegula broadly shagreened; without groove on outer margin. Forewing densely infuscate; stigma separated by more than its length from basal vein; radius with rudimentary spur on first section, but without terminal spur; the area of the first cubital cell is 17.0 times that of the stigma.

Areola of dorsal propodeum with its sides slightly sigmoid and convergent, its length about 3 times apical width. Tergum 1 with double-arc'd transverse carina, not defining a coarsely sculptured area; preapical band of very small, widely separated punctures, not impressed, poorly defined and about 2 punctures wide. Terga 3 and 4 sparsely and irregularly punctate, with broad impunctate apices which are medially about 6 times diameter of adjacent punctures. Pygidium on basal half; impunctate apex scarcely wrinkled and shagreened almost to its tip.

Length 12.2 mm.

MALE.—Unknown.

51. *Tiphia (Tiphia) putumayoa*, new species

FIGURE 55

T. putumayoa is described from a single type specimen in which the locality label is not clearly legible. In the key it is paired with *T. perubra* from which it differs in having sparse punctation on the upper front, and rugulae of the lateral propodeum which are much weaker and more closely spaced.

HOLOTYPE.—♀; "La Chorarra" (?), Putumayo District, Peru, 17/23-VIII-1930, Cornell University Expedition (CU).

FEMALE.—Front with coarse primary punctures of first-degree density on lower half, on upper half largely of second- or third-degree without interspaces as wide as an ocellus. Mandible with a small preapical notch.

Dorsal pronotum without transverse carina; punctures of nearly uniform overall density which is of first- and second-degrees. Lateral pronotum with the

most conspicuous sculpturing a faint groove across disc; ventral angle aciculate. Scutum with antero-medial escarpment and notaulices not connected. Mesopleuron with relatively large primary punctures separated by distances about equal to average diameter of punctures; long, dense microsetae covering entire mesopleuron except on ventral aspect and a small supra-spiracular callosity. Hind tibia only slightly angular in cross section, upper margin not arched. Hind basitarsus not grooved. Tegula without shagreening or marginal grooves. Forewing (Figure 55) densely infumate; stigma separated by much more than its length from basal vein; radius terminating in a strong outwardly directed spur; the area of the first cubital cell is 40.0 times that of the stigma.

Dorsal propodeum with its areola nearly rectangular and not more than two and one-half as long as wide. Lateral propodeum on upper part with extremely fine, closely spaced rugulae becoming evanescent on border of lower part; latter with tuft of curly microsetae on border of metacoxal cavity. Tergum 1 with well-developed transverse carina, not doubly arched, and with minute buttressing ridges; preapical band of small punctures irregularly distributed, separated by more than their average diameters, not well differentiated from other dorsal punctures, and about 2 punctures wide. Intermediate terga with punctures of moderate size and of relatively uniform size and distribution; bristles white. Pygidium uniformly punctate on basal three-fifths, with dark yellow bristles; impunctate apex not shagreened.

Length 10.4 mm.

MALE.—Unknown.

52. *Tiphia (Tiphia) gilvapennis*, new species

T. gilvapennis is described from a single type specimen. Species of *Tiphia* with bright red legs and yellow wings are uncommon in either South or North America. Its bright colors alone would probably serve to separate this species from other described species in the Peru-Ecuador-Bolivia area. In the key it runs to the group that has no basitarsal groove and no transverse carina on the first tergum. None of the other species in this group are brightly colored. I have seen one other specimen somewhat doubtfully included as a paratype. It was taken in Matto Grosso, Brazil, and differs from the holotype in having somewhat blackish legs, of which the hind tibia is not carinate on the

inner face and is slightly arched on the upper margin, the anterior carina of the pronotum is complete and well-developed. Other characters of head, tegula, lateral propodeum, and first tergum closely resemble those of the holotype.

HOLOTYPE.—♀; Monson Valley, Tingo Maria, Peru, 29-XI-1954 (E. I. Schlinger and E. S. Ross) (CAS).

FEMALE.—Basal joints of antenna, mandibles, impunctate apex of dorsal pronotum, all legs distal to coxae, tegula and apex of pygidium, bright red. Front with small punctures of first-degree density not above lower third, of second-degree along eyes with large middle area of upper two-thirds having interspaces as much as two times width of an ocellus. Head width 1.9 times least distance between eyes.

Dorsal pronotum with transverse carina barely traceable on lateral one-third; punctate part with small primaries largely of second-degree density, and a few secondaries medially. Lateral pronotum with a short, crescent-shaped escarpment on middle without ventral rugulae. Mesopleuron on anterior slope with very small primary punctures separated on average by much more than their diameters; subtegular patch of dense microsetae wider than tegula. Scutum with antero-medial escarpment not connected with notaulices. Hind tibia on inside with a prominent ridge and an obscure sensorium flush with surrounding surface. Hind basitarsus without groove. Tegula without shagreening or groove on outer margin. Forewing with membrane pale yellow; stigma separated by slightly less than its length from basal vein; radial cell short, 2.9 times as long as wide; radius without spur in first section but terminating in short spur directed forward and outward.

Dorsal propodeum with lateral discal areas glossy, bearing a few punctures near areola; areola narrowly keystone-shaped, more than 3 times as long as apical width. Lateral propodeum on upper part with a very large number of fine and closely spaced rugulae; lower part with microsetae limited to small sparse tuft on posterior fifth. Tergum 1 without transverse carina; preapical band modified into a narrow polished groove in which there is only an occasional obscure puncture. Intermediate terga with moderate-sized punctures of relatively uniform size and distribution; third and fourth terga medially with impunctate apices about 4 to 5 times diameter of largest adjacent punctures.

Pygidium punctate on basal half; impunctate apex not wrinkled or shagreened.

Length 6.4 mm.

MALE.—Unknown.

PARATYPE.—Rio Caraguata, Matto Grosso, Brazil, III-1953 (F. Plaumann) (UK).

53. *Tiphia (Tiphia) acadamae*, new species

FIGURE 56

This species runs in the key to species which have no groove in the hind basitarsus and no anterior transverse carina on the first tergum. It differs from *santacruzae* in having a prominent anteromedian callosity on sternum 2 and in lacking shagreening on the tegula. A paratype, collected at the same locality and in the same year as the holotype, differs from it in not having a detectable groove on the lateral pronotum, in lacking terminal rows of micropunctures over the middle of the terga, in a different cubital-cell-stigma ratio, and in not having the preapical band as clearly defined. Despite these differences it resembles the holotype in so many other respects that I have included it in the same species.

HOLOTYPE.—♀; Monson Valley, Tingo Maria, Peru, 2-XII-1954 (E. I. Schlinger and E. S. Ross) (CAS).

Female.—Front with its punctures coarse, deep, contiguous. Hair of cheek not masking underlying structure. Mandible without preapical denticle.

Dorsal pronotum except for narrow impunctate median vitta with punctures on anterior part everywhere of close first-degree density; transverse carina lacking. Lateral pronotum with a narrow groove across disc; ventral corner with fine aciculations. Scutum with anteromedian escarpment not connected with notaulices. Mesopleuron on outer disc with large primary punctures largely of second-degree density and widely scattered minute secondaries; subtegular patch of dense microsetae wider than tegula. Legs black. Hind tibia with inner face strongly ridged, its sensorium stubbily clavate, about one-fifth width of joint, flush with surrounding surface. Hind basitarsus without groove. Tegula not shagreened and without groove on outer margin. Forewing (Figure 56) with its membrane strongly infumated; stigma separated by about its length from basal vein; radius with sharp bend in its first section one-third distance

to intercubitus, its apex almost without spur; the area of the first cubital cell is 27.5 times that of the stigma.

Dorsal propodeum free of punctures or prominent sculpturing; areola with slightly sigmoid sides, scarcely converging, length about twice apical width. Lateral propodeum on upper part with rugulae strong and widely spaced; lower part posteriorly with a conspicuous brush of dense, fine, short, curly microsetae. Tergum 1 without anterior transverse carina, preapical band narrowing over middle to a single row of punctures which are small, not impressed with ranging in intervals up to about 2 puncture diameters. Sternum 2 with keellike callosity. Intermediate terga with moderate-sized punctures of relatively uniform size and distribution, those of tergum 3 over middle separated from apex by 4 to 5 times diameter of largest adjacent punctures; apices of terga 2 and 3 with an obscure row of micropunctures. Pygidium on basal half closely rugose punctate, the punctures irregularly separated from the impunctate apex; apical half faintly shagreened basally.

Length 12.2 to 13.0 mm.

MALE.—Unknown.

PARATYPE.—1; same locality as holotype, 3-X-1954 (E. I. Schlinger and E. S. Ross) (CAS).

54. *Tiphia (Tiphia) bassleri*, new species

FIGURE 57

This species is characterized by the absence of a groove on the hind basitarsus, no transverse carina on the anterior part of tergum 1 or median callosity on the second sternum. The tibial sensorium is large, short and reddish, the tegula is broadly shagreened, and there is usually at least a median section of a transverse carina on the dorsal pronotum. One specimen which has been listed as a paratype was not collected at the type locality. This has most of the characters of the holotype but has a low, complete transverse carina on the dorsal pronotum and has distinct rugulae in the ventral angle of the lateral pronotum.

HOLOTYPE.—♀; "Achinamiza," Peru, 9-I-1926, F 6007 (H. Bassler) (AMNH).

FEMALE.—Front on upper half with punctures generally of second-degree density without interspaces as wide as an ocellus. Hair of cheeks short and fine,

not masking underlying area. Mandible without preapical denticle.

Dorsal pronotum with faint transverse carina in middle section but absent at humeral angle; punctures largely of first-degree density but somewhat irregularly distributed. Lateral pronotum without transdiscal groove, with scattered punctures and without rugulae. Scutum with a plaque of contiguous punctures, lacking interspersed secondaries; antero-median escarpment not connected with notaulices. Mesopleuron on outer disc with moderate-sized punctures largely of second- or first-degree density with widely scattered secondaries; subtegular patch of dense microsetae broader than tegula. Legs black to piceous. Hind tibia with carinate inner face; sensorium reddish, triangular, about one-fourth as wide as joint and only slightly longer than wide, flush with surrounding surface. Hind basitarsus without groove. Tegula broadly fine shagreened without groove on outer margin. Forewing (Figure 57) with its membrane deeply infuscate; stigma very small and separated by much more than its length from basal vein;

radius with obscure spur on first section and rudimentary outwardly directed terminal stump; first cubital cell with an area 27.5 times that of stigma.

Dorsal propodeum beside areola without any coarse sculpturing; areola with straight sides, slightly tapered, 3 times as long as apical width. Lateral propodeum on more than half of lower part with conspicuous mat of microsetae. Tergum 1 without anterior transverse carina; preapical band not impressed and consisting of a single row of coarse punctures separated by much less than their average diameter. Intermediate terga with punctures of somewhat variable size and distribution, at middles with impunctate apices several times diameters of largest adjacent punctures. Sternum 2 without anteromedian callosity. Terga 2 and 3 without apical rows of micropunctures. Pygidium elongate punctate on basal half; impunctate part conspicuously shagreened to near apex.

Length 13.8 to 14.9 mm.

PARATYPE.—Tumupasa, Bolivia, XII-1921 (W. M. Mann) (USNM).

Southern South America

Key to Males: Southern South America

1. Sternum 5 with lateral denticles 2
Sternum 5 without lateral denticles 9
2. Tergum 1 with anterior transverse carina 3
Tergum without anterior transverse carina 5
3. Sterna 3 and 4 each with inverted U-shaped escarpments laterally
55. *T. vincenta*, new species
Sterna 3 and 4 without lateral U-shaped escarpments 4
4. Terga 2 and 3 with a conspicuous row of moderate-sized, preapical punctures connected on their anterior margins by an escarpment which is not crooked or infolded
56. *T. cosquina*, new species
Terga 2 and 3 with a conspicuous infolded preapical incision, at places curved around anterior margins of very coarse, shallow punctures 57. *T. jujuya*, new species
5. Terga 3, 4, and 5 each with a conspicuous transverse row of very coarse punctures which are dimpled and expanded laterally 58. *T. teutonia*, new species
Terga 3, 4, and 5 with relatively small punctures of nearly uniform size 6
6. Dorsal pronotum without transverse carina; radial cell in lateral extension greatly exceeded by second cubital cell 59. *T. jonesi* Turner
Dorsal pronotum with complete transverse carina 7
7. Radial cell of forewing greatly exceeded in lateral extension by second cubital cell
60. *T. sierra*, new species
Radial cell of forewing exceeding second cubital cell in lateral extension 8
8. Mesopleuron on anterior face with very numerous secondary punctures; inner face of hind tibia prominently carinate 61. *T. alpha*, new species
Mesopleuron on anterior face with only a few scattered secondary punctures; inner face of hind tibia not carinate 62. *T. gamma*, new species

9. Tergum 1 with anterior transverse carina 10
 Tergum 1 without anterior transverse carina 16
10. Terga 3, 4 and 5 each with a well-defined escarpment around anterior part 11
 Terga 3, 4 and 5 without anterior encircling escarpments 12
11. Radial cell of forewing equal to or only slightly exceeding second cubital cell in lateral extension; middle area of terga 3 and 4 with numerous punctures, none of which are greatly enlarged 63. *T. parkeri*, new species
 Radial cell of forewing greatly exceeds second cubital in lateral extension; middle area of terga 3 and 4 with punctures greatly reduced in numbers and greatly enlarged
 64. *T. plaumanni*, new species
12. Cheek narrower than an antennal fossa 65. *T. colalao*, new species
 Cheek as wide or wider than antennal fossa 13
13. Intermediate terga terminating in belts of dense, white bristles; their punctures not enlarged and of uniform size 66. *T. walzi*, new species
 Intermediate terga at apices at most with a single terminal row of widely spaced bristles 14
14. Dorsal propodeum outside areola coarsely reticulate with crooked rugulae converging from areola and the very high transverse carina toward spiracular cavity
 67. *T. arnau*, new species
 Dorsal propodeum outside areola not coarsely reticulate or rugulose 15
15. Head width 2.1 to 2.2 times least distance between eyes 68. *T. beta*, new species
 Head width 1.8 and 1.9 times least distance between eyes 69. *T. catarina*, new species
16. Several punctures of terga 3 and 4 greatly enlarged and dimpled 17
 None of punctures of terga 3 and 4 much larger than their neighboring punctures 19
17. Terga 3, 4, and 5 without an escarpment on anterior border of punctate part, but each with a belt of short, erect microscopic bristles 70. *T. saopaula*, new species
 Terga 3, 4, and 5 with an escarpment on anterior border of punctate part, without belts of microscopic bristles 18
18. Escarpment on anterior border of terga 3, 4, and 5 strongly developed; preapical band of tergum 1 a deep groove without punctures 71. *T. lassana*, new species
 Escarpment on anterior border of 3, 4, and 5 weakly developed; preapical band of tergum 1 not deeply impressed and consisting of well-separated punctures
 72. *T. cornelliana*, new species
19. Preapical band of tergum 1 abruptly impressed on anterior border 20
 Preapical band of tergum 1 not impressed 21
20. Lateral propodeum with widely spaced rugulae; transverse carina of pronotum buttressed its entire length with cross ridges 73. *T. diamantina*, new species
 Lateral propodeum with many closely spaced rugulae; transverse carina of pronotum not buttressed with cross ridges 74. *T. cumana*, new species
21. Radial cell of forewing greatly exceeds second cubital cell in lateral extension
 75. *T. uruuma*, new species
 Radial cell of forewing equal to second cell in lateral extension 76. *T. sankutei*, new species

Key to Females: Southern South America

1. Hind basitarsus on inner face with longitudinal groove 2
 Hind basitarsus on inner face without groove 6
2. Tergum 1 with anterior transverse carina 3
 Tergum 1 without anterior transverse carina 4
3. Mandible with sharp-pointed preapical denticle; rugulae of upper lateral propodeum coarse and widely separated 62. *T. parkeri*, new species
 Mandible without preapical denticle; rugulae on upper lateral propodeum fine and closely spaced 77. *T. meridionalis*, Turner
4. Mitral-shaped enclosure of dorsal propodeum obsolete; pygidium impunctate on not more than apical third; rugulae of lateral propodeum numerous and closely spaced
 78. *T. makdona*, new species
 Mitral-shaped enclosure of dorsal propodeum clearly outlined; pygidium impunctate on apical half; rugulae on anterior half of lateral propodeum widely separated 5

- 5. Median-sized species; second sternum with perceptible median callosity; upper front and anterior dorsal pronotum without interspaces as wide as an ocellus; lateral pronotum without trace of groove across disc; impunctate apex of pygidium without rugulae or longitudinal wrinkles 79. *T. margareta*, new species
- Large species: second sternum without median callosity; upper front and anterior dorsal pronotum with interspaces as wide as an ocellus; lateral pronotum usually with narrow groove across disc; impunctate apex of pygidium with longitudinal wrinkles or ridges... 80. *T. gigantea* Turner
- 6. Exceptionally slender species with propodeum 1.4 times as long as wide 81. *T. elongata* Turner
- Species not exceptionally slender; propodeum rarely longer than wide 7
- 7. Tergum 1 with an anterior transverse carina; scutum without anteromedian escarpment... 9
- Tergum 1 without an anterior transverse carina 10
- 8. Scutum with an anteromedian escarpment 82. *T. selloi*, new species
- Scutum without anteromedian escarpment 9
- 9. Terga with dense apical bands of white bristles; preapical band of tergum 1 not bordered anteriorly by an escarpment 65. *T. walzi*, new species
- Terga without dense apical bands of bristles; preapical band of tergum 1 bordered anteriorly by an escarpment 83. *T. cordoba*, new species
- 10. Preapical band on tergum 1 bordered on anterior margin by an escarpment 11
- Preapical band of tergum 1 without escarpment on anterior border 13
- 11. Tibiae conspicuously inflated on outer face 84. *T. michelbacheri*, new species
- Tibiae not inflated on outer face 12
- 12. Propodeal areola unusually slender, about 4 times as long as apical width; rugulae of lateral propodeum very numerous and closely spaced; micropunctures of anterior mesopleuron not continued below angle of prepectal ridge 85. *T. parana*, new species
- Propodeal areola much less than 3 times as long as apical width; rugulae of lateral propodeum coarse and widely spaced; micropunctures of anterior mesopleuron continued ventrally far below angle of prepectal ridge 86. *T. shannoni*, new species
- 13. Sensorium of hind tibia an abruptly and deeply sunken pit... 87. *T. tucumanae*, new species
- Sensorium of hind tibia not abruptly or deeply sunk below surrounding area 14
- 14. Very large species with mesopleuron almost devoid of primary punctures 88. *T. malleri*, new species
- Small to medium-sized species with numerous punctures on upper part of mesopleuron ... 15
- 15. Sternum 2 with a strong anteromedian callosity 89. *T. inusitata*, new species
- Sternum 2 without anteromedian callosity 16
- 16. Transverse carina of dorsal pronotum incomplete 90. *T. annabella*, new species
- Transverse carina of dorsal pronotum complete 17
- 17. Impunctate apex of pygidium broadly and coarsely shagreened; areola of dorsal propodeum less than 3 times as long as apical width 91. *T. corumba*, new species
- Impunctate apex of pygidium polished; areola of dorsal propodeum very slender, about 4 times as long as apical width 92. *T. tonia*, new species

55. *Tiphia (Tiphia) vincenta*, new species

FIGURE 26

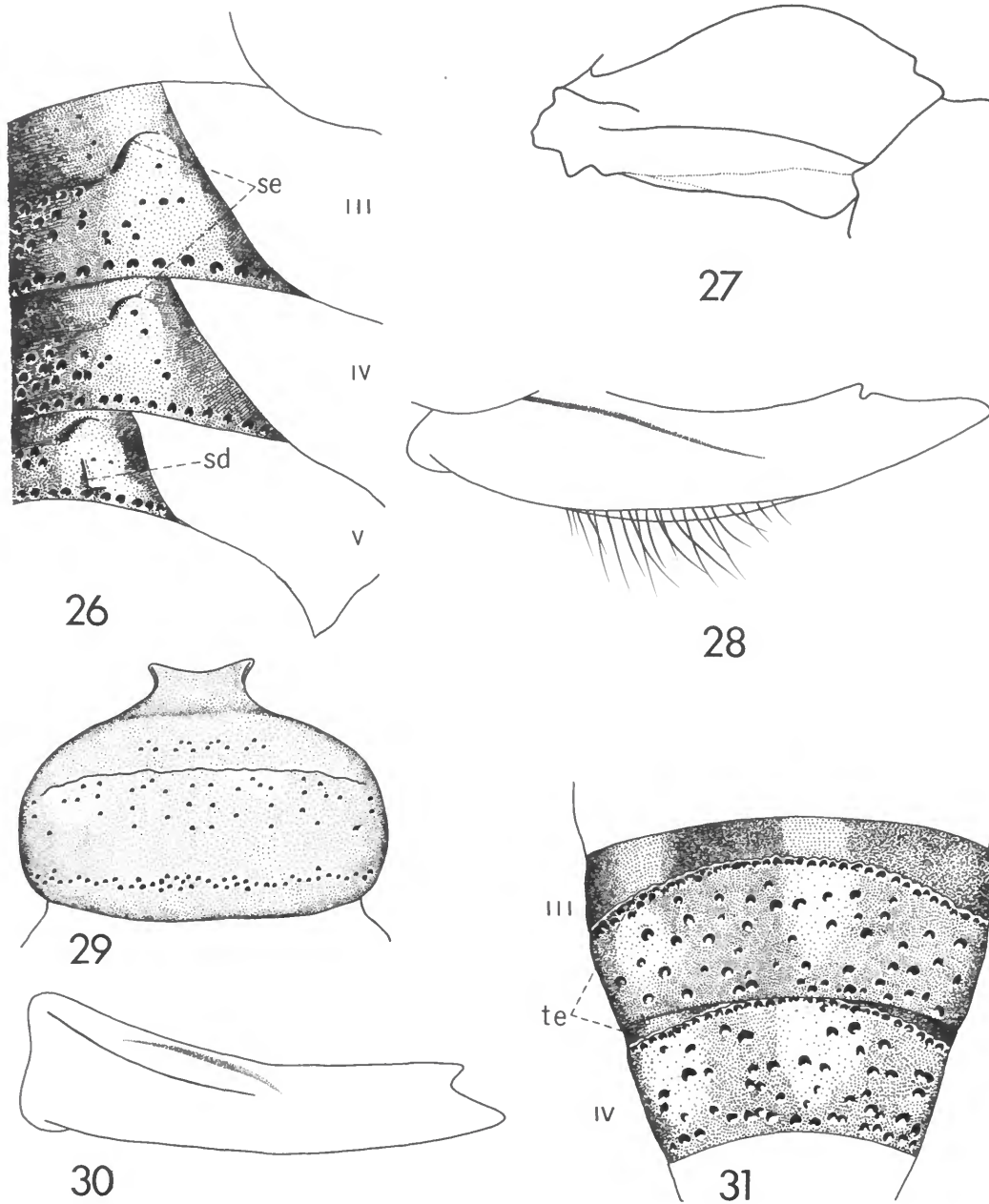
This species has been described from a single male specimen. I have seen no other species from the Americas, Asia, or Africa having the peculiar U-shaped escarpments of the sterna found in this species.

HOLOTYPE.—♂; Sao Vincenti, Sao Paulo, Brazil, IV-1954 (R. N. H. Kraus) (USNM).

MALE.—Front with coarse, contiguous punctures on lower half with a few interspersed secondaries, upper half sparsely punctate with numerous inter-

spaces wider than an ocellus. Head 2.1 times as wide as least distance between eyes. Cheek about as wide as an antennal fossa. Mandible with a rudimentary preapical denticle.

Dorsal pronotum with high transverse carina strongly buttressed from side to side, with much elongated cross ridges; laterally with a small cluster of coarse punctures, over middle area with only about 30 small and widely separated punctures. Lateral pronotum with anterior process sharp-crested to ventral terminus; with fine rugulae in ventral corner, and a crescent-shaped escarpment across middle disc. Meso-



FIGURES 26-31.—26, Male of *Tiphia vincenta*, new species, from Sao Vincent, Brazil, sterna showing U-shaped escarpments and denticle. 27, male of *Tiphia teutonia* from "Nova" Teutonia, Brazil, showing lateral view of tergum 1. 28-31, male and female of *Tiphia parkeri*, new species, from Sao Paulo, Brazil: 28, female mandible. 29, female tergum 1 showing transverse carina; 30, male mandible; 31, male terga showing transverse escarpment anterior to punctures. (*sd*=sternal denticle. *se*=sternal escarpment, *te*=transverse escarpment.)

pleuron with anterior slope bearing small primaries of third-degree density and secondaries that are less numerous than primaries except on subtegular slope; subtegular area with patch of microsetae much narrower than tegula. Fore and middle legs largely piceous. Hind tibia on inner face sharply carinate, the carina not expanded about slitlike sensorium. Tegula glossy, without marginal grooves. Forewing with hyaline membrane; radial cell slightly exceeding second cubital cell in lateral extension; sectors of second cubital cell in relation to inner sector (itob) are 10:28:18:24.

Dorsal propodeum lateral to areola polished except on rugulose upper third; areola keystone-shaped, about one and one-half times as long as apical width; median carina arborescent. Lateral propodeum with middle rugulae very widely spaced. Tergum 1 with high transverse carina buttressed with cross ridges from side to side; preapical band irregular, diffuse, not impressed, 2 to 3 punctures wide, the punctures separated by much more than their average diameter. Abdominal terga with punctures very sparse and small, generally separated by much more than their average diameter, on terga 2 to 5 terminating in transverse rows near middles of exposed part of terga. Sterna 3, 4, and 5 (Figure 26) with paired inverted U-shaped escarpments. Sternum 5 with a broad appressed lateral denticle.

Length 5.5 mm.

FEMALE.—Unknown.

56. *Tiphia (Tiphia) cosquina*, new species

This species has several unusual characters which include the extremely coarse punctures of head, dorsal pronotum, scutum and mesopleuron, and also the tergal escarpments linking the terminal rows of punctures. It is also numbered among the few South American species having denticles on sternum 5.

HOLOTYPE.—♂; "Cosquin, Sierra de Cordoba," Argentina, 1/9-III-1920 (Harris) (CU).

MALE.—Front with conspicuously coarse primary punctures contiguous on lower front and broadly so along eye orbits, sparse on a small area of middle upper front without interspaces as wide as an ocellus; secondaries absent. Head width 2.0 times least distance between eyes. Cheek slightly wider than an antennal fossa.

Dorsal pronotum with an exceptionally high transverse carina, buttressed by many elongate cross ridges which are almost half as long as median length of pronotum; medially with only one row of punctures posterior to buttressing ridges. Lateral pronotum with an obscure crescent-shaped escarpment on middle disc. Scutum completely coarse punctate with interspaces reduced to high reticulum. Mesopleuron with exceptionally coarse contiguous punctures covering all slopes except the ventral; without secondary punctures or subtegular microsetae. Legs largely black. Hind tibia with inner face strongly carinate; sensorium elongate oval and sunk slightly below level of narrow surrounding ridges. Tegula very faintly shagreened dorsally, without groove on outer margin. Forewing deeply infumate; radial cell very slightly exceeding second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:30:21:27.

Dorsal propodeum with lateral discs coarsely reticulate; areola tapered not over one-fourth longer than apical width, median carina a narrow triangle connected with lateral carinae by strong, straight cross ridges. Posterior aspect of propodeum dorsally with many strongly anastomosing rugulae merging to finely reticulate apically. Tergum 1 with a strong transverse carina bordered by a row of irregularly contiguous punctures; preapical band a single row of punctures separated usually by distances about equal to their average diameter, not impressed apically but with an irregular escarpment linking their anterior margins. Terga 2 to 6 with punctures increasing in size from base to apex of each segment without any grossly enlarged, dimpled primaries; terminal row of each segment connected by a conspicuous escarpment. Sterna with similar apical transverse escarpments. Sternum 5 with a small, appressed, broadly triangular lateral denticle.

Length 9.0 mm.

FEMALE.—Unknown.

Described from a single specimen mounted in two pieces. The abdomen was detached and remounted by the author while attempting to repair the loose original mounting.

57. *Tiphia (Tiphia) jujuya*, new species

Only 6 described species of male *Tiphia* from southern South America have sternal denticles. One other

species, *T. cosquina*, has a transverse carina on tergum 1. In *T. jujuya* the preapical escarpments on the abdominal terga are stronger, at places infolded, and wind in and out around the anterior margins of adjacent, greatly enlarged preapical punctures. Known only from the holotype specimen.

HOLOTYPE.—♂; "San Juancito," Jujuy, Argentina, 27-II-1920 (CU).

MALE.—Front with median-sized primary punctures of well-separated first-degree density, except on a small area anterior to ocellar triangle; lower half with numerous secondaries. Head width 1.9 times least distance between eyes. Antennal flagellum 1.19 times head width. Cheek wider than an antennal fossa. (One mandible defective).

Dorsal pronotum with high, sharp transverse carina flanked by sulcus which is crossed by numerous short ridges. Lateral pronotum with a deep, slenderly crescent-shaped excavation across middle disc. Mesopleuron on outer disc with median-sized primary punctures separated in some directions by intervals exceeding their average diameter; interspersed secondaries minute and much more numerous than primaries. Legs partly piceous. Hind tibia obscurely carinate on inner face. Tegula without shagreening or groove about outer margin. Forewing with membrane moderately infumated; radial cell much exceeding second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector are (itob) 10:28:17:25.

Dorsal propodeum with area beside areola only faintly sculptured; areola keystone-shaped, only slightly longer than apical width. Tergum 1 with high transverse carina extending evenly all the way across dorsum and bordered by a narrow, obscurely scalariform sulcus; preapical band a single row of coarse, more or less coalesced punctures, impressed, with trace of escarpment on anterior border. Terga 2, 3, and 4 with conspicuous, more or less infolded preapical escarpment, curving in and out about anterior border of very large, subobsolete punctures, and followed by a distinct apical row of much smaller punctures. Sternum 5 with lateral denticle terminating in small, conical, elevated point. Sternum 4 with a much smaller lateral denticle.

Length 8.2 mm.

FEMALE.—Unknown.

58. *Tiphia (Tiphia) teutonia*, new species

FIGURE 27

This species which has a rudimentary transverse incision of tergum 1 in the region of the preapical band, is in that respect similar to the Asiatic subgenus *Jaynesia*, but there is no close resemblance in other characters. The peculiar enlarged punctation of the abdominal terga is similar to that found in *jujuya* but unlike that species it has no trace of a transverse carina on tergum 1.

HOLOTYPE.—♂; "Nova" Teutonia, Brazil 27°11'S by 52°23'W, 300-500 m, February 1965 (Fritz Plaumann) (CNC).

MALE.—Front with coarse deep punctures of first-degree density on lower half and along eyes, but of third-degree medially on upper half with several interspaces as wide as an ocellus; without secondaries on upper half; head width 2.3 times least distance between eyes; cheek not wider than an antennal fossa. Clypeal extension strongly bidentate. Mandible with a rudimentary preapical cusp.

Dorsal pronotum with a high, prominent transverse carina; its bordering sulcus with only obscure cross ridges; punctures large, sparsely distributed, with many interspaces exceeding diameter of largest punctures. Lateral pronotum with anterior process low and broadly rounded ventrally; disc aciculate and irregularly rugulose without well-defined transdiscal groove. Legs entirely black. Hind coxa without ridge between inner and ventral faces. Hind tibia on inner face without carina or naked stripe; sensorium minute, slitlike. Tegula without marginal grooves. Forewing with membrane moderately infumate; lateral extension of radial cell greatly exceeding that of second cubital cell; sectors of second cubital cell in terms of inner sector (itob) are 10:23:17:18.

Dorsal propodeum beside areola smooth and glossy; areola strongly tapered, its length twice, and its base almost twice apical width. Tergum 1 (Figure 27) with dorsum very sparsely punctate; preapical band consisting of a single row of deeply impressed, coalesced punctures bordered anteriorly by a sharp-crested, overhanging transverse carina. Terga 2 and 3 in middles with an anterior transverse band of fine punctures separated from a preapical row of irregular-shaped, very large dimpled punctures, and on terga 3 with an apical row of much smaller punctures. Pygidium without lateral groove and carina border-

ing punctate part. Sternum 5 with small, spinose, decumbent lateral denticles.

Length 7.0 to 7.8 mm.

FEMALE.—Unknown.

PARATYPES.—2; same data as holotype (CNC).

59. *Tiphia (Tiphia) jonesii* Turner

Tiphia jonesii Turner, 1908:130.—Allen 1962:67.

Turner described this species from southern Brazil. He stated that his description was based on 2 specimens and that the type was in the British Museum. The author redescribed a specimen in the British Museum labeled as B.M. Hymenoptera Type No. 15.1176. Since there seemed to be some uncertainty as to whether Turner designated a holotype, Allen designated as lectotype this specimen from Castro, Parana, Brazil, collected in 1905 by E. D. Jones. This species belongs to a relatively small group of southern South American species in which there is, in the male, a denticle on the fifth sternum, relatively small tergal punctures and no transverse carina on tergum 1. The possession of a very short radial cell much exceeded in lateral extension by the second cubital cell is unusual.

LECTOTYPE.—♂; Castro, Parana, Brazil, 1905, E. D. Jones, British Museum Type No. 15.1176.

MALE.—Front on upper half with interspaces as wide as an ocellus; secondary punctures continued into upper half. Cheek at least one and one-half times as wide as antennal fossa. Mandible obscurely cusped.

Dorsal pronotum with its transverse carina lacking except at humeral angle. Lateral pronotum without groove across its disc. Mesopleuron on its outer disc with primary punctures largely of third-degree density and interspersed secondaries much more numerous than primaries. Legs largely black. Hind tibia on inner face with naked longitudinal stripe. Tegula with outer and posterior margins somewhat angular; without shagreening or groove on outer margin. Forewing with membrane hyaline; radial cell in lateral extension much exceeded by second cubital cell in which the apical section is sloped inward toward costal margin.

Dorsal propodeum with areola keystone shaped; length about twice apical width. Posterior aspect of propodeum without conspicuous sculpturing. Tergum 1 without transverse carina; preapical band shallowly impressed, in middle half with discrete punctures about

2 punctures wide. Intermediate terga with punctures of nearly equal size, uniformly distributed. Fifth sternum with low, transverse lateral denticle.

This species is known to the author only from the lectotype specimen. The above descriptive notes were derived from my redescription (Allen 1962). The whereabouts of the second specimen mentioned by Turner is unknown to me.

60. *Tiphia (Tiphia) sierra*, new species

FIGURE 48

Tiphia sierra is similar to *T. jonesii* in having radial cell terminating far mesad of second cubital cell, in the presence of lateral denticles on the fifth sternum, and absence of a transverse carina on the first tergum. It differs in having a complete pronotal carina, coarse primary punctures and no secondaries on the anterior mesopleuron, and in the strongly sculptured dorsal propodeum.

HOLOTYPE.—♂; "Cosquin, Sierra de Cordoba," Argentina, 1/9-III-1920 (CU).

MALE.—Front with punctures of first-degree density except for small area anterior to ocellar triangle where they are of third-degree; no secondaries on upper half. Antennal flagellum stout, 1.48 times as long as head width. Head width 1.9 least distance between eyes. Cheek wider than antennal fossa. Mandible without preapical cusp.

Dorsal pronotum with low, but complete, transverse carina; without bordering sulcus. Lateral pronotum finely aciculate, without groove across its disc. Mesopleuron on entire anterior slope except near tegula with very close, contiguous punctures, and almost no secondaries. Legs with inner faces of fore and hind tibiae somewhat reddish. Hind tibia on inner face with a naked stripe broadened about clavate sensorium. Tegula without shagreening, or groove about outer margin. Forewing (Figure 48) with membrane almost hyaline; radial cell much exceeded by second cubital cell, the anterior margins of these 2 cells strongly sloped inward toward costal margin. Sectors in terms of inner sector (itob) are 10:26:-21:32.

Dorsal propodeum with areas lateral to areola strongly reticulopunctate; areola with strongly convergent sides, its length more than 2 times, and its base nearly 2 times apical width. Posterior aspect of pro-

podeum not strongly sculptured. Tergum 1 without anterior transverse carina; dorsal area with numerous large, shallow, widely separated punctures; preapical band in shallow depression and consisting of a single row of large, shallow, well-separated punctures. Intermediate terga with coarse, shallow punctures, none of which are conspicuously enlarged, but which are rather evenly distributed. Sternum 5 with appressed, crescent-shaped lateral denticle.

Length 6.5 mm.

FEMALE.—Unknown.

Known only from the holotype specimen.

61. *Tiphia (Tiphia) alpha*, new species

T. alpha resembles *T. gamma* in having a denticle on the fifth sternum, no carina on tergum 1, and no enlarged punctures on the intermediate terga. It differs in having numerous secondary punctures on the anterior mesopleuron, a much shorter areola, and a carinate inner face of the tibia. There are other minor differences.

HOLOTYPE.—♂; "Bello Horizonte," Brazil (M. Gerais) 1-XI-1919 (CU).

MALE.—Front with punctures of close first-degree density on lower third and along inner eye, of third-degree elsewhere with 1 or 2 interspaces as wide as an ocellus. Head width 2.4 times least distance between eyes (2 measured were 2.3, 2.4). Cheek narrower than antennal fossa. Mandible without preapical cusp.

Dorsal pronotum with complete, high transverse carina; bordering sulcus crossed by numerous short, buttressing ridges; punctures largely of third-degree density. Lateral pronotum without groove on middle disc. Mesopleuron with greater part of anterior slope having small, widely separated primary punctures, and much more numerous secondaries. Legs somewhat reddish on inner surfaces and at joints. Hind tibia on inner face strongly carinate. Tegula not shagreened; with shallow groove on apical margin continued a short distance about outer apical angle. Forewing with membrane almost hyaline; radial cell much exceeding second cubital cell in lateral extension. Sectors of second cubital cell in terms of inner sector (itob) are 10:25:18:17.

Dorsal propodeum with area bordering areola only faintly sculptured; areola keystone-shaped, its length 2 times, and its base only slightly wider than, apical

width. Tergum 1 without anterior transverse carina; preapical band abruptly impressed on anterior border and consisting of single row of coarse punctures which are much compressed laterally. Intermediate terga of medium-sized punctures none of which are conspicuously enlarged. Sternum 5 with small, appressed lateral denticle.

Length 6.8 to 7.3 mm.

FEMALE.—Unknown.

PARATYPE.—1; same data as holotype. (CU).

62. *Tiphia (Tiphia) gamma*, new species

This small species has denticles on the fifth sternum, no transverse carina on the first tergum, only fine punctures on the intermediate terga, and a radial cell exceeding the second cubital cell in lateral extension. It differs from *T. alpha* in having only sparse secondary punctures on the anterior face of the mesopleuron, and a longer areola with a narrower apex.

HOLOTYPE.—♂; "Nova" Teutonia, Brazil, 27°11'B, 52°23'W, 300-500 m, 14-VIII-1962 (Fritz Plaumann) (CNC).

MALE.—Front on lower half with many punctures separated by distances greater than their average diameter; on upper half with interspaces wider than an ocellus; secondaries confined to lower third. Antennal flagellum 1.31 times as long as head width. Head width 2.2 times least distance between eyes. Cheek slightly narrower than antennal fossa. Mandible without preapical cusp.

Dorsal pronotum with sharp, high carina; bordering sulcus traversed by many moderately distinct cross ridges; lateral discs of punctate part with fine punctures separated by several times their average diameter. Lateral pronotum with anterior process low and broadly rounded for its entire length; without groove across middle disc. Mesopleuron on outer disc with only a few small and very widely scattered punctures separated by several times their average diameter; no interspersed secondaries; subtegular patch of microsetae obsolete. Legs piceous. Hind tibia on inner face without trace of carina or naked streak. Tegula with outer margin orbicular; without marginal grooves. Forewing with membrane moderately infumate; radial cell greatly exceeding second cubital cell in lateral extension; second cubital cell much elongated, its sectors in terms of inner sector (itob) are 10:25:15:19.

Dorsal propodeum beside areola not rugose or reticulate; areola elongate, tapered, its length more than 3 times and base almost 2 times apical width. Tergum 1 without transverse carina; preapical band of large, shallow, irregular punctures, 1 puncture wide and abruptly impressed only on anterior border. Intermediate terga with only small primary punctures of nearly uniform size. Sternum 5 with an appressed lateral denticle lunate on inner edge. Sternum 6 with only short, sparse, decumbent hairs.

Length 4.8 to 6.1 mm.

FEMALE.—Unknown.

PARATYPES.—2; "Nova" Teutonia, Santa Catarina, Brazil, 3-XI-1955 and 28-XI-1956 (F. Plaumann) (CU).

63. *Tiphia (Tiphia) parkeri*, new species

FIGURES 28, 29, 30, 31

This is one of the few described species of *Tiphia* from South America represented by an adequate series, and the only one linked by rearing from a known host. The female is selected as the holotype because of the unusual occurrence in that sex of a cusped mandible and an anterior transverse carina on tergum 1. The male is unusual in possessing strong preapical mandibular denticles and encircling escarpments anterior to the punctures on the intermediate abdominal terga.

HOLOTYPE.—♀; Sao Paulo, Brazil, host *D. rugifrons*, no. 802, 24-V-1943 (Parker) (USNM).

FEMALE.—Front with coarse, deep punctures of first-degree density everywhere except for small strip anterior to lowest ocellus; secondaries lacking. Clypeal extension bilobate on front shorter than antennal base line. Mandible (Figure 28) slender, with a small but distinct preapical notch.

Dorsal pronotum without trace of transverse carina; punctures coarse, deep, and of first-degree density medially and in transverse band. Lateral pronotum with series of rugulae in ventral corner; without groove across middle disc. Mesopleuron on anterior slope with coarse, round punctures, principally of first-degree density, and almost free of secondaries; subtegular patch of dense microsetae broader than tegula. Scutum with anteromedian escarpment and notaulices not connected. Legs black. Hind tibia on inner face with carina complete; sensorium small,

clavate, flush with surrounding area. Hind basitarsus grooved. Tegula sometimes lacking shagreening, sometimes faintly but broadly shagreened; without groove on outer margin. Forewing moderately infumate; stigma separated by more than its length from basal vein; radius without backward directed spur on first section, or terminal spur.

Dorsal propodeum almost free of sculpturing except for broad area of extremely fine shagreening within and outside areola; areola with slightly sigmoid sides, slightly more than twice as long as apical width. Lateral propodeum on upper part with strong, widely separated rugulae; lower part with dense microsetae on posterior half bordering coxal cavity. Tergum 1 (Figure 29) with long, thin transverse carina; anterior aspect medially with elongate patch of dense, minute punctures; preapical band a single impressed row of large punctures somewhat irregularly spaced and aligned. Intermediate terga with coarse, deep punctures fairly uniform in size and distribution except for a small nearly impunctate band on tergum 3; terminal punctures separated from apices by about 3 times their average diameter. Pygidium rugose punctate on basal half; usually with well-defined median emargination; impunctate apex wrinkled and obscurely shagreened near punctate part.

Length 10.0 to 13.4 mm.

ALLOTYPE.—♂; same data as holotype except date which is 11-VI (USNM).

MALE.—Front with primary punctures of first-degree density on lower two-thirds and above along eyes, thinning to third-degree in a small area about ocellar triangle but without interspaces wider than an ocellus; small secondaries abundant on lower two-thirds. Head width 2.0 times least distance between eyes (3 measured were 2.0, 2.0, 2.0). Cheek slightly wider than antennal fossa. Mandible (Figure 30) with a strong preapical denticle.

Dorsal pronotum with a sharp-crested transverse carina; bordering sulcus without cross ridges; punctures moderately coarse. Lateral pronotum broadly aciculate with a crescent-shaped escarpment across middle disc. Mesopleuron on anterior slope with punctures ranging from first-degree density near prepectus to third-degree near crest; minute secondaries, at least near prepectus more numerous than primaries; without narrow subtegular patch of dense microsetae. Legs black. Hind tibia carinate on inner face. Tegula not shagreened; posterior marginal

groove terminating at outer apical corner in a line of irregular punctures, outer margin not grooved. Forewing with hyaline membrane; radial cell equaling or slightly exceeding second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:23:18:24.

Dorsal propodeum relatively smooth; areola slightly tapered, about one and one-fourth times as long as apical width, median carina usually more than half complete and slenderly triangular. Lateral propodeum on upper part strongly rugulose, the rugulae widely separated and of uniform coarseness to caudal corner. First abdominal segment short. Tergum 1 with strong, thin-crested transverse carina; preapical band a single row of coarse punctures, not impressed, separated from each other by less than their average diameter and from apex by slightly more than a diameter. Terga 3, 4, and 5 (Figure 31) with a conspicuous transverse escarpment anterior to punctures; punctures oblique or dimpled and somewhat coarser in middle areas of terga. Sternum 5 without lateral denticles.

Length 6.5 to 9.1 mm.

PARATYPES.—The following females reared by Parker from *D. rugifrons* from Sao Paulo, Brazil (USNM): 1; 15-II-1942. 1; 16-II-1942. 1; 7-III-1942. 2; 10-I-1943. 1; 17-II-1943. 1; 24-V-1943. 1; 9-VII-1943. 1; 22-III. 1; 27-V. 3; 8-VI. 1; 11-VI. 1; 27-VII. The following females reared by Parker from Scarabeidae from Sao Paulo, Brazil (USNM): 1; 4-VII-1942. 1; VIII-1942. The following males reared by Parker from *D. rugifrons* from Sao Paulo, Brazil (USNM): 1; 12-II. 1; 16-II. There is also 1 male ex Scarabeidae, raised by Parker from Sao Paulo, VIII-1942 (USNM) and 1 male collected by Silveira from foliage, Sao Paulo, January, 1942, which oddly enough is mounted with a cocoon (USNM). In addition there are from Sao Paulo, Brazil, 8 females and 1 male reared specimens in which the data is obscured but which appear to belong to the above series reared from *D. rugifrons* (USNM).

This species is named in honor of Dr. H. L. Parker who for many years was in the foreign service of the United States Department of Agriculture as a specialist on beneficial insects useful in biological control of plant pests. The specimens in the type series were all obtained by the Montevideo laboratory of the United States Department of Agriculture. In the

process of relaxing the specimens, essential for satisfactory identification, the ink used on some of the labels became smeared and illegible.

64. *Tiphia (Tiphia) plaumanni*, new species

FIGURE 32

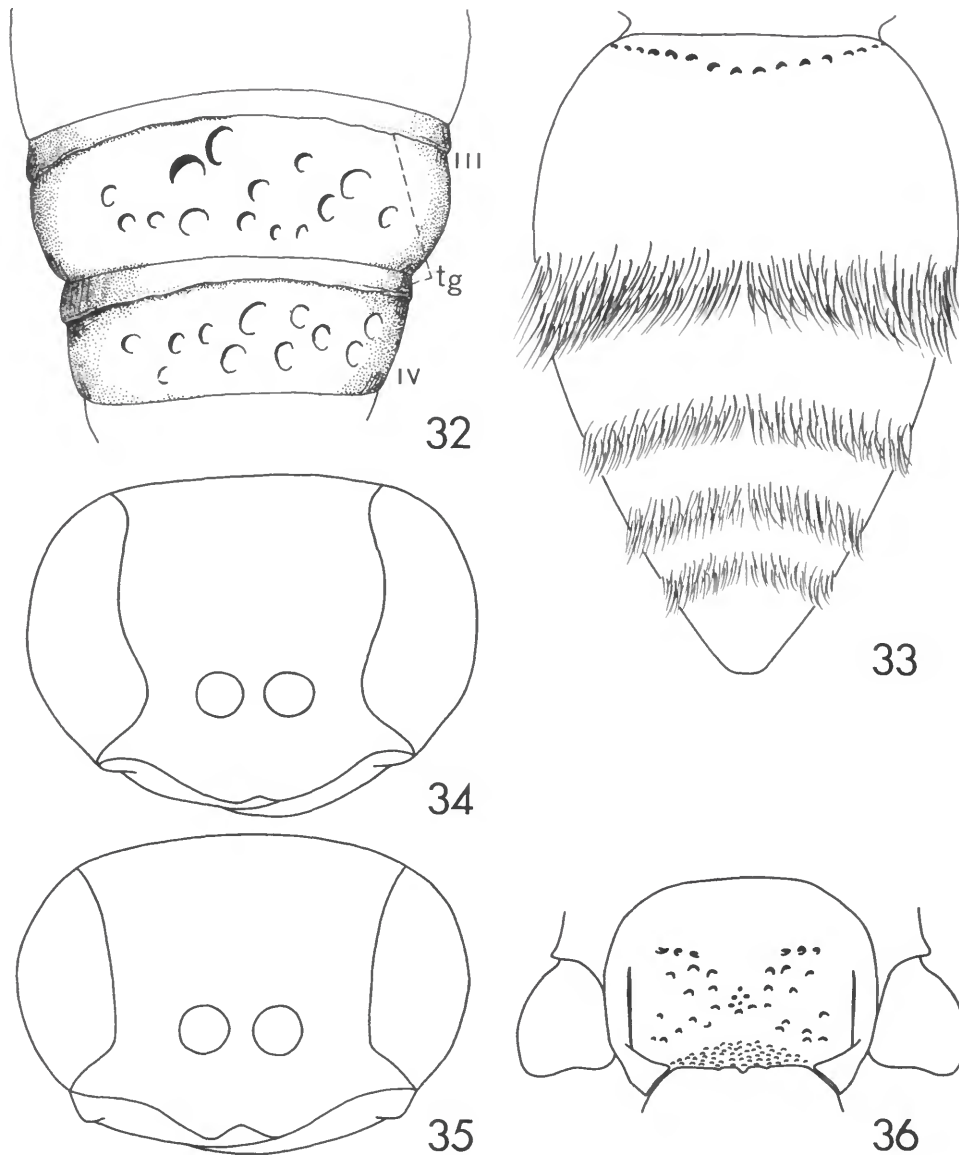
This species is quite distinct from any other known species from South America. It differs from *T. parkeri* in having the radial cell of the forewing greatly exceeding the second cubital cell and in having much coarser abdominal punctures. It is known only from the holotype specimen.

HOLOTYPE.—♂; "Nova" Teutonia, Santa Catarina, Brazil, 3-II-1954. (Fritz Plaumann) (UK).

MALE.—Front with moderate-sized punctures of first-degree density to level of lowest ocellus with secondaries on lower half. Antennal flagellum 1.28 times head width. Head width 2.2 times least distance between eyes. Cheek not wider than antennal fossa. Mandible with short but massive preapical cusp.

Dorsal pronotum with high transverse carina bordered by a prominent scalariform sulcus; punctures tending toward third-degree density except along sulcus. Lateral pronotum with anterior process sharply carinate to ventral angle and prominent at humeral angle; disc deeply depressed at center, irregularly rugulose without well-developed transdiscal groove. Mesopleuron on anterior slope with punctures ranging from first- to third-degree density, minute secondaries more numerous than primaries. Hind tibia on inner face carinate, not expanded around small, slitlike sensorium. Tegula glossy with no groove on outer margin. Forewing with membrane slightly infumate; lateral extension of radial cell greatly exceeds that of second cubital cell.

Dorsal propodeum with its areola keystone-shaped, about one and one-half times as long as apical width; area lateral to areola microscopically aciculate. Tergum 1 with strong transverse carina complete from edge to edge and bordered by a transverse band of shallow, irregular punctures; preapical band an impressed single row of coarse, closely spaced punctures separated from apex by not more than width of its largest punctures. Terga (Figure 32) 3, 4, and 5 each with a conspicuous anterotransverse groove, and a very few large punctures some of which are con-



FIGURES 32-36.—32, Male of *Tiphia plaumanni*, new species, from "Nova" Teutonia, Brazil, terga 3 and 4 showing antero-transverse grooves. 33, male of *Tiphia walzi*, new species, from San Pedro de Colalao, Argentina, tergum showing belts of bristles. 34, male of *Tiphia beta*, new species, from "Nova" Teutonia, Brazil, head outline. 35, male of *Tiphia catarina*, new species, from Santa Catarina, Brazil, head outline. 36, female of *Tiphia cordoba*, new species, from "Cosquin, Sierra de Cordoba," Argentina, scutum showing absence of antero-medial escarpment. (*tg*=tergal groove.)

spicuously dimpled; apices with obscure punctures or gouges. Sternum 5 without lateral denticles.

Length 6.4 mm.

FEMALE.—Unknown.

65. *Tiphia (Tiphia) colalao*, new species

T. colalao is known only from the holotype male. Its most distinctive characters are the narrow cheek, the obscure transverse carina of tergum 1, the narrow, deeply impressed preapical band of tergum 1 consisting of unusually coarse punctures, and the enlarged, dimpled punctures of the intermediate terga.

HOLOTYPE.—♂; S. P. Colalao, Tucuman, Argentina, January 1953 (F. H. Walz) (UK).

MALE.—Front on lower half with coarse, very closely contiguous primary punctures, with moderate numbers of large secondaries on narrow ridges between the primaries; upper front on a small area equal to ocellar triangle with punctures of third-degree density. Head width 2.2 times least distance between eyes. Cheek slightly narrower than antennal fossa. Clypeal extension perceptibly bidentate; lateral carina obsolete; lateral excavation shallow. Mandible not cusp.

Dorsal pronotum with sharp, high carina; its bordering sulcus crossed by many short cross ridges; punctures closely contiguous in a narrow band bordering sulcus. Lateral pronotum with anterior process uniformly carinate to ventral corner; disc flat with aciculations of assorted sizes. Mesopleuron on anterior aspect near prepectus with coarse primary punctures of first-degree density and minute secondaries much more numerous than primaries. Hind tibia on inner face with low carina terminating apically in a clavate polished area about sensorium. Tegula shining with outer edge orbicular; with marginal groove about outer apical angle. Wing with membrane moderately infuscate; radial cell slightly exceeding second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:30:19:27.

Dorsal propodeum lateral to areola coarsely reticulate on anterior half; areola with concave sides and apex equalling base; length slightly greater than apical width. Tergum 1 with irregular, obscure transverse carina; preapical band of very coarse coalesced punctures in a deep, narrow trench separated from apex by less than its width. Terga 3 to 5 with some punctures greatly enlarged and dimpled. Sternum 5

without lateral denticles. Sternum 6 without median tuft of erect hairs.

Length 7.5 mm.

FEMALE.—Unknown.

66. *Tiphia (Tiphia) walzi*, new species

FIGURE 33

T. walzi is described below from 2 specimens, a male and a female collected on the same date and at the same location, and possessing a number of distinctive characters in common. This is the only South American species I have seen in which there are, in both sexes, conspicuous terminal bands of bristles on the abdominal terga. The absence of an anteromedian escarpment of the scutum of the female is unusual. The closed radial cell in the female is also unusual, but in this area there are frequently individual aberrations, and this may be the case in the allotype specimen.

HOLOTYPE.—♂; San Pedro Colalao, Tucuman, Argentina, I-1953 (F. H. Walz) (UK).

MALE.—Front to level of lowest ocellus with punctures barely of first-degree density; without secondaries. Cheek much wider than an antennal fossa. Head width 1.7 times least distance between eyes. Mandible with a blunt preapical cusp.

Dorsal pronotum with only a vestige of transverse carina at humeral angle. Lateral pronotum with irregular rugulae on middle disc, but without well-defined transdiscal groove. Mesopleuron on outer disc coarsely punctate with punctures chiefly of first-degree density, and without secondaries; subtegular patch of dense micropunctures as wide as tegula. Legs black. Hind tibia on inner face without ridge; sensorial area large, moderately concave. Tegula without shagreening or marginal grooves. Forewing with membrane obscurely minute setulose, brilliantly yellowish brown; lateral extension of radial cell not equaling that of second cubital cell; radial cell only 2.4 times as long as wide; sectors of second cubital cell in terms of inner sector (itob) are 10:27:22:27.

Dorsal propodeum obscurely close punctate on shagreened background, areola abruptly tapered with a narrow terminal "stem"; only slightly longer than basal width; transverse carina very high and bordered by a row of about 16 uniformly sized pits. Lateral propodeum on upper part with very many closely

spaced rugulae. Tergum 1 very short, its anterior face nearly perpendicular to body axis; with a sharp-crested transverse carina; preapical band slightly depressed and consisting of closely spaced primary and secondary punctures 3 to 6 punctures wide; apex laterally with conspicuous recumbent bristles. Terga 2 to 6 (Figure 33) with coarse punctures unusually uniform in size and distribution; apices of each with a conspicuous belt of irregular white bristles. Sternum 5 without lateral denticle.

Length 8.7 mm.

ALLOTYPE.—♀; same data as holotype. (UK).

FEMALE.—Front with coarse punctures contiguous on lower half, smaller and generally of second-degree density on upper third, no interspaces as wide as an ocellus. Mandible uniformly tapered on apical half.

Dorsal pronotum without transverse carina except vestigially at humeral angle; coarsely and uniformly punctate except for impunctate apex which is medially as wide as punctate part. Lateral pronotum with many strong rugulae on lower two-thirds and a poorly defined escarpment across middle disc. Scutum without trace of anteromedian escarpment; with coarse punctures fairly uniformly distributed over entire area between notaulices. Mesopleuron on anterior slope very coarsely punctate with primaries and about an equal number of large secondaries; subtegular patch of dense micropunctures as wide as tegula. Legs black except the outer face of middle and hind tibia which are piceous. Hind tibia rounded in cross section without ridge on inner face, the upper margin moderately arched; sensorium concave, almost as broad as basitarsus, less than twice as long as wide. Hind basitarsus without groove. Tegula highly polished, without marginal grooves. Forewing with golden brown membrane; stigma separated by less than its length from basal vein; radial cell closed at apex by a vein sloped strongly inward toward costal margin (both wings of allotype).

Dorsal propodeum with shagreening overlaid with a pattern of shallow, closely spaced punctures; areola with sides concave and strongly convergent, apical width scarcely more than half basal width, median carina complete, expanded. Lateral propodeum on upper part with rugae exceptionally fine, numerous and closely spaced; lower part with a few microsetae on posterior third. Tergum 1 with a complete, sharp-crested transverse carina; preapical band at sides not distinguishable from other dorsal punctures, not im-

pressed, at middle about 5 punctures wide; laterally with tuft of irregular white bristles. Terga 2 to 5 with punctures and apical bands of bristles similar to those described for the male. Pygidium on basal two-thirds with fine, close, elongate punctures; impunctate apex glossy, not shagreened.

Length 9.6 mm.

67. *Tiphia (Tiphia) arnau*, new species

There is a considerable degree of group resemblance between the species *T. arnau*, *T. beta*, and *T. catarina*. All have relatively wide cheeks, shagreened tegulae, smoky wings in which the radial cell greatly exceeds the second cubital cell, a transverse carina on the first tergum, enlarged dimpled punctures on the intermediate terga and no sternal denticles. *T. arnau* is readily distinguished from *T. catarina* and *T. beta* by the coarsely rugulose dorsal propodeum and high transverse propodeal carina. Its cheek is narrower than that of *T. catarina*. The species is described from a single holotype specimen.

HOLOTYPE.—♂; San Pedro de Colalao, Tucuman, Argentina, 9-II-1947 (J. M. Arnau) (CDA).

MALE.—Front everywhere with closely contiguous punctures except narrowly below ocellar triangle; with sparse secondaries, confined to lower half. Head width 2.0 times least distance between eyes. Cheek slightly wider than an antennal fossa. Antennal flagellum slender, 1.47 times head width. Mandible without preapical denticle.

Dorsal pronotum with a high, sharp-crested transverse carina; bordering sulcus narrow, over its entire length crossed by short obscure ridges; punctures coarse and generally of first-degree density; impunctate part with an acute-pointed margin medially. Lateral pronotum without groove or escarpment across its middle disc. Mesopleuron on its anterior slope with its primary punctures of moderate size and largely of second-degree density, interspaces everywhere with minute secondaries that are much more numerous than the primaries; without patch of subtegular microsetae. Legs black. Hind tibia with an inconspicuous, linear sensorium, inner face obscurely carinate. Tegula broadly shagreened, with a fine groove very close to margin and interrupted at outer apical angle. Forewing with radial cell greatly exceeding second cubital in lateral extension, narrowly

open (both wings); sectors of second cubital cell in terms of inner sector (itob) are 10:32:19:28.

Dorsal propodeum on lateral discs with crooked rugulae converging from their origins in transverse and areola carinae; areola with concave sides slightly tapered, length about one and one-fourth times apical width, disc deeply reticulate; transverse apical carina unusually high. Tergum 1 with a short, obscure, transverse carina flanked caudad by a densely punctate area; preapical band a single row of contiguous punctures deeply sunk in a narrow trench and separated from apex by slightly more than its width. Terga 3, 4, and 5 each with several much enlarged and dimpled punctures. Fifth sternum without lateral denticle.

Length 10.8 mm.

FEMALE.—Unknown.

68. *Tiphia (Tiphia) beta*, new species

FIGURE 34

Tiphia beta lacks the coarsely reticulate dorsal propodeum of *T. arnau* and has a narrower cheek than *catarina*. It is represented in the type series by 2 males collected in southern Brazil. In this series the areola is rectangular or barrel-shaped and the primary punctures of the mesopleural disc are small and widely separated.

HOLOTYPE.—♂; "Nova" Teutonia, Brazil, 27°11' S by 52°W, 300 to 500 m, II-1967 (Fritz Plaumann) (CNC).

MALE.—Front with coarse punctures of first-degree density on lower half, generally of second-degree medially on upper half without spaces as wide as an ocellus; numerous secondaries on lower two-thirds. Head width (Figure 34) 2.1 times least distance between eyes (2 measured were 2.1, 2.1). Antennal flagellum slender, 1.49 times head width. Cheek as wide as an antennal fossa. Clypeal extension strongly bidentate. Mandible without preapical cusp.

Dorsal pronotum with a strong transverse carina buttressed with many short ridges. Lateral pronotum with anterior process a low ridge of uniform height; disc with only fine obscure rugulae in ventral corner. Mesopleuron on outer disc with small punctures of widely spaced, third-degree density, and minute secondaries many times more numerous than the primaries. Legs entirely black. Hind tibia on inside with a naked strip elevated in area around the small,

slenderly clavate sensorium. Tegula broadly sha-greened without groove on outer margin. Forewing with membrane densely infumated; radial vein with a short spur on first section; radial cell greatly exceeds second cubital cell in lateral extension.

Dorsal propodeum lateral to areola glossy, with 10 widely separated punctures; areola barrel-shaped, its apex at least as wide as base, length about one and one-third times apex. Tergum 1 with an anterior transverse carina; preapical band a narrow, regular row of impressed punctures separated by narrow ridges. Terga 3, 4, and 5 with much enlarged punctures in middle of segments; and with an apical row of much smaller, widely separated punctures. Sternum 5 without lateral denticles. Sternum 6 without median tuft of erect hairs.

Length 10.4 mm.

FEMALE.—Unknown.

PARATYPE.—♂; same locality as holotype, collected I-1967 (Fritz Plaumann) (CNC).

69. *Tiphia (Tiphia) catarina*, new species

FIGURE 35

Tiphia catarina has in all 3 specimens of the type series a rudimentary transverse carina of the first tergum similar to that found on *T. arnau*, and also a similar densely bipunctate mesopleuron, but it has a much wider cheek and lacks the strongly sculptured dorsal propodeum of *T. arnau*. In *T. beta*, the carina on tergum 1 is more strongly developed, the primary punctures of the mesopleuron are finer and more widely spaced, and the cheek is not as wide.

HOLOTYPE.—♂; "Nova" Teutonia, Santa Catarina, Brazil 25-III-1951 (Fritz Plaumann) (UK).

MALE.—Punctures of first-degree density on lower half, thinning to second-degree on middle of upper half without any interspaces as wide as an ocellus; secondaries abundant on lower half. Antennal flagellum perceptibly thickened in middle, 1.26 times head width. Head width (Figure 35) 1.8 times least distance between eyes (3 measured were 1.9, 1.8, 1.8). Cheek wider than antennal fossa. Clypeal extension perceptibly bidentate. Mandible without preapical cusp.

Dorsal pronotum with a low, complete transverse carina; bordering sulcus shallow, almost free of cross ridges; punctures coarse and fairly uniformly distributed. Lateral pronotum usually without groove

across its disc. Mesopleuron on outer disc with punctures relatively small and largely of third-degree density; secondaries are minute and everywhere except on ventral aspect are much more numerous than primaries; subtegular patch of dense microsetae as wide as tegula. Hind tibia on inner face sharply carinate; sensorium poorly defined. Tegula orbicular on outer margin; without marginal grooves; usually faintly but broadly shagreened. Forewing with membrane slightly infuscated; radial cell greatly exceeding second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:27:18:28.

Dorsal propodeum beside areola polished, without sculpturing; areola slightly tapered, keystone-shaped, only slightly longer than apical width. Tergum 1 with a scarcely distinguishable irregular transverse carina; preapical band a single row of coarse, closely contiguous punctures moderately impressed and separated from apex by less than twice diameter of larger punctures. Terga 3 to 5 with conspicuously enlarged dimpled punctures, and apically with a row of moderate-sized punctures. Sternum 5 without lateral denticles. Sternum 6 with only sparse, inconspicuous, recumbent hairs.

Length 9.8 mm.

FEMALE.—Unknown.

PARATYPES.—1; "Nova" Teutonia, Brazil, 27°11'S by 52°23'W, 200–500 m, I–1967 (Fritz Plaumann) (CNC). 1; "Crest Ridge," N.W. Tucuman, Argentina, 2–XI–1951 (Ross and Michelbacher) (CAS).

70. *Tiphia (Tiphia) saopaula*, new species

T. saopaula has a combination of characters, such as absence of denticles on sternum 5 and of a transverse carina on the first tergum, by which it keys out in the vicinity of *T. lassana* and *T. cornelliana*, both of which it resembles in having enlarged dimpled punctures on the intermediate terga. It differs from either of these by having an anterior belt of small, dense, erect bristles on terga 3, 4, and 5 and in lacking an anterior escarpment on these terga.

HOLOTYPE.—♂; Sao Paulo, Brazil, "5–I–1967" (V. R. Alin) (UK).

MALE.—Front with primary punctures of first-degree density limited to lower two-fifths; 2 or 3 interspaces on upper front as wide as an ocellus; secondaries numerous but not extending into upper

half. Antennal flagellum slender, 1.44 times as long as head width (2 measured were 1.42, 1.45). Head width 2.2 times least distance between eyes (3 measured were 2.2, 2.2, 2.3). Cheek as wide as an antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with strong, sharp-crested transverse carina supported by numerous short ridges across adjoining sulcus. Lateral pronotum with anterior process of normal height; sometimes with an arc-shaped escarpment across middle disc. Mesopleuron on outer disc with fine primary punctures separated by several times their average diameter, interspersed with somewhat more numerous secondaries. Hind tibia on inner face strongly carinate, the carina broadened apically to surround a narrowly triangular sensorium. Tegula without shagreening or groove on outer margin. Forewing with membrane slightly infumate; radial cell slightly exceeds second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:18:15:15.

Dorsal propodeum with lateral part slightly roughened, with numerous shallow punctures; areola strongly tapered with rounded apex; length less than twice apical width. Tergum 1 without transverse carina; preapical band a narrow groove containing coalesced punctures, groove bordered anteriorly by an overhanging escarpment. Terga 2 to 6 each with a band of greatly enlarged and dimpled punctures; apex of each with a distinct microgroove; at base of terga 3 to 5 occur somewhat obscure bands of dense, semi-erect, minute bristles. Sternum 5 without lateral denticles. Sternum 6 without median tuft of erect hairs.

Length 6.2 mm.

FEMALE.—Unknown.

PARATYPES.—2; Ouro Preto, Minas Gerais, Brazil, IV–1954 (N. L. H. Krauss) (USNM).

71. *Tiphia (Tiphia) lassana*, new species

This species has a number of unusual characters distinguishing it from other species of southern South America. These include the sparsely punctate upper front, the red legs, the preapical band of tergum 1 which is reduced to an impunctate groove, and the peculiar lateral escarpments on the intermediate terga. The species is known only from the holotype specimen.

HOLOTYPE.—"Lassanos," Minas Gerais, Brazil,

9/19—XI—1919, Cornell University Expedition Lot 569 (CU).

MALE.—Front sparsely fine punctate, with several interspaces on upper half that are wider than an ocellus. Head 2.0 times as wide as least distance between eyes. Antennal flagellum stout, 1.25 times as long as head width. Cheek slightly wider than antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with high, sharp-crested carina; bordering sulcus without well-developed cross ridges; punctures very small and generally separated by several times their average diameter. Lateral pronotum smooth, with crescent-shaped escarpment extending two-thirds distance across disc. Mesopleuron with primary punctures ranging from coarse ones closely spaced near prepectal suture to very small ones separated by several times their average diameter on outer disc; minute punctures present only as a subtegular patch narrower than tegula and narrowly along prepectal suture. Legs red. Hind tibia on inner face with broad naked streak which is not carinate, sensorium minute, clavate. Tegula thin, translucent, largely rufous, without shagreening or marginal grooves. Forewing with hyaline membrane; radial cell slightly exceeding second cubital cell in lateral extension.

Dorsal propodeum outside areola free of coarse sculpturing, largely smooth and polished; areola elongate with slightly tapered sides, length nearly 3 times, and base one and one-half times apical width. Lateral propodeum on upper part with weak, widely spaced rugulae which are entirely absent posteriorly. First abdominal segment slightly elongated, 1.1 times as long as wide. Tergum 1 without transverse carina and dorsal disc without punctures; preapical band a narrow impunctate groove bordered anteriorly by a strong escarpment. Terga 2 to 5 each with a lateral escarpment not continued over dorsum, all except that on tergum 2 lying anterior to punctate part; terga 3, 4, and 5 each possessing laterally 3 large coalesced dimpled punctures in which all but anterior rim is obsolete. Sternum 5 without preapical denticles.

Length 5.5 mm.

FEMALE.—Unknown.

72. *Tiphia (Tiphia) cornelliana*, new species

This species is known only from the holotype specimen. *T. cornelliana* resembles *T. lassana* in having

escarpments on the intermediate terga located anterior to the punctate part. In *T. cornelliana*, however, these escarpments are much weaker and the preapical band of tergum 1 is not impressed and consists of well-separated punctures, while in *T. lassana* it is a deep groove lacking punctures.

HOLOTYPE.—♂; "Uruoum," Corumba, Brazil, 23/29—XII—1919, Cornell University Lot 659 (CU).

MALE.—Front on upper third with several interspaces as wide as an ocellus; on lower half with numerous secondaries. Head width 2.3 times least distance between eyes. Cheek slightly narrower than antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with high, sharp-crested carina; bordering sulcus without cross ridges; punctures small and generally separated by several times their average diameter. Lateral pronotum without rugulae or groove across middle disc. Mesopleuron on outer disc with small, sparse primary punctures separated by several times their average diameter, and minute secondaries somewhat more numerous than primaries. Legs piceous. (Both hind legs missing.) Tegula without shagreening or marginal grooves. Forewing with membrane nearly hyaline; radial cell greatly exceeding second cubital cell in lateral extension; sectors of second cubital cell in terms of inner sector (itob) are 10:23:15:22.

Dorsal propodeum outside areola polished, without coarse sculpturing; areola slightly tapered; its length about one and three-fourths, and basal width one and one-third times apical width. Lateral propodeum on upper part with strong rugulae anteriorly, becoming finer posteriorly and absent from caudal corner. Tergum 1 without anterior transverse carina; preapical band a single row of widely separated punctures only slightly impressed. Terga 3, 4, and 5 without belts of small bristles anteriorly; with several very large dimpled punctures on middle areas; with a fine escarpment on each side and anterior to punctures; with apical microscopic grooves more or less interrupted medially. Sternum 5 without lateral denticles.

Length 6.1 mm.

FEMALE.—Unknown.

73. *Tiphia (Tiphia) diamantina*, new species

I have recognized 4 species from southern South America in which the males have no sternal denticles, no transverse carina on tergum 1, and in which the

punctures of the intermediate terga are not conspicuously enlarged. *T. diamantina* differs from *T. uruouma* and *T. sankutei* in having the preapical band of tergum 1 outlined on anterior border with an escarpment. *T. cumana* has most of the same characters including the escarpment bordering the preapical band, but differs from *T. diamantina* in having numerous secondary punctures on the front, no cross ridges buttressing the transverse carina of the dorsal pronotum, very many closely spaced rugulae on lateral propodeum and a long terminal spur on the cubital vein.

HOLOTYPE.—♂; Diamantina, Minas Gerais, Brazil, 14/18-XI-1919, Cornell University Expedition Lot 869 (CU).

MALE.—Front coarsely close punctate except on small area in front of ocellar triangle; without secondaries. Head width 2.1 times least distance between eyes. Cheeks slightly wider than an antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with sharp-crested transverse carina; bordering sulcus crossed over its entire length by short cross ridges; punctures moderately coarse and separated by distances about equal to their average diameter. Lateral pronotum without groove across disc. Mesopleuron on outer disc with moderate-sized primary punctures separated in all directions by interspaces equal to or greater than their average diameter; with only a few minute secondaries; subtegular patch of dense micropunctures not as wide as tegula. Legs black to piceous. Hind tibia obscurely carinate on inner face, the carina expanded apically around a slenderly ovate sensorium. Tegula piceous without shagreening or marginal grooves. Forewing with its membrane hyaline; radial cell equal to or slightly exceeding second cubital cell in lateral extension, its terminal sector bent at middle; sectors of second cubital cell in terms of inner sector are 10:21:16:18.

Dorsal propodeum outside areola with coarse sculpturing limited to a group of shallow punctures beside areola and short ridges buttressing apical carina; areola keystone-shaped, slightly longer than basal width, length about one and one-half apical width, median carina nearly complete, narrowly linear. Lateral propodeum with rugulae widely separated and present to caudal corner. Tergum 1 without transverse carina; preapical band a single impressed row of indistinct punctures, separated from apex by 3 to 4 times width of band and bordered anteriorly by a

distinct escarpment. Intermediate terga with punctures of nearly uniform size and distribution. Sternum 5 without lateral denticles.

Length 6.5 mm.

FEMALE.—Unknown.

74. *Tiphia (Tiphia) cumana*, new species

This species, known only from the holotype specimen is close to but apparently distinct from *T. diamantina*, also described from a single specimen taken in a locality over 700 miles distant.

HOLOTYPE.—♂; San Pedro de Colalao, Tucuman, Argentina, 9-II-1947 (J. M. Arnau) (USNM).

MALE.—Front with moderately coarse punctures of first-degree density except for small area in front of ocellar triangle; secondaries numerous on lower half. Head width 1.9 times least distance between eyes. Cheek wider than antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with high, complete transverse carina not buttressed by short ridges; punctures moderately coarse and generally of first-degree density. Lateral pronotum without transverse groove or escarpment. Mesopleuron on outer disc with small primary punctures separated by more than their average diameter and not more than an equal number of minute secondaries; subtegular patch of dense micropunctures as wide as tegula, gradually thinning out along prepectal suture. Legs black. Hind tibia with obscure carina on inner face, broadened terminally to surround the thin elongate sensorium. Tegula without shagreening or marginal grooves. Forewing with membrane slightly infuscate; radial cell in its lateral extension equal to second cubital cell, its apical section bent at middle. Sectors of second cubital cell in terms of inner sector (itob) are 10:16:15:16. Cubital vein with elongate terminal spur.

Dorsal propodeum with area beside areola polished and almost free of sculpturing; areola with strong converging sides and rounded apex, base more than two times apex; length about one and one-half times base and three times apex. Lateral propodeum with very many closely spaced rugulae continued into caudal corner. Tergum 1 without anterior transverse carina; preapical band reduced to a narrow groove without punctures and overhung anteriorly by a strong escarpment. Intermediate terga without es-

carpments or any grossly enlarged punctures. Sternum 5 without lateral denticles.

Length 7.5 mm.

FEMALE.—Unknown.

75. *Tiphia (Tiphia) uruouma*, new species

T. uruouma is grouped with *T. sankutei* since both have no sternal denticles, no transverse carina of tergum 1, and they do not have grossly enlarged punctures nor encircling escarpments on the intermediate terga, and the tergal band of tergum 1 is not bordered anteriorly by an escarpment. The apex of the apical cell in *T. uruouma* extends far beyond that of the second cubital cell while in *T. sankutei* it is only equal in lateral extension. In *T. uruouma* an exceptional character is the terminal row of bristle-bearing punctures on the abdominal terga. The adults in this group are much larger insects than those in the *T. saopaula*, *T. lassana*, *T. cornelliana* group.

HOLOTYPE.—1 ♂; "Uruoum," Corumba, Brazil, 23/29-XII-1919, Cornell University Expedition Lot 569 (CU).

MALE.—Front with coarse punctures of first-degree density on lower half and broadly along eye, but in a small median area below ocellus of third-degree density without interspaces as wide as an ocellus; a few secondaries on lower half. Head width 2.3 times least distance between eyes. (2 measured were 2.2 and 2.3). Cheek almost as wide as an antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with high, sharp-crested transverse carina, bordered by sulcus crossed from side to side with many regularly spaced, short cross ridges; punctures moderately coarse. Lateral pronotum without groove across middle disc. Mesopleuron on anterior slope with median-sized primary punctures of first- or second-degree density; with small secondaries more numerous than primaries only on upper anterior area, where they merge with a subtegular patch of dense microsetae as wide as tegula. Legs partially castaneous. Hind tibia on inner face with a long, sharp carina. Tegula broadly and conspicuously shagreened, without groove on outer margin. Forewing with a sclerotized inward directed spur on first section of radius; radial cell much exceeding second cubital cell in lateral extension, 3.4 times as long as wide. Sectors of second cubital cell in terms of inner sector are 10:28:17:25.

Dorsal propodeum with lateral discs smooth except for faint shagreening; areola with concave converging sides, length about one and one-half and base about equal apical width, median carina linear, almost complete. Tergum without anterior transverse carina. Terga 3 to 5 each with a regularly spaced terminal row of punctures in each of which is seated one long, conspicuous bristle; other punctures relatively coarse and of uniform size and distribution. Sternum 5 without lateral denticles.

Length 9.5 mm.

PARATYPE.—1; "Uruoum," Corumba, Brazil, 23/29-XII-1919 (Harris), Cornell University Expedition Lot 569 (CU).

FEMALE.—Unknown.

76. *Tiphia (Tiphia) sankutei*, new species

T. sankutei differs from *T. uruouma* in having a long, usually faintly sclerotized spur on the first section of the radius, and in lacking on the intermediate terga conspicuous apical rows of bristle-bearing punctures.

HOLOTYPE.—♂; Buenos Aires Province, Argentina, 15-I-1925 (M. Sankute) (CAS).

MALE.—Front entirely covered with contiguous punctures; with numerous minute secondaries on lower two-thirds. Head width 2.0 times least distance between eyes (2 measured were 2.0, 1.9). Cheek slightly wider than antennal fossa. Mandible without preapical denticle.

Dorsal pronotum with carina sharp and high; bordering sulcus scalariform for its entire length, the cross ridges very short. Lateral pronotum faintly rugulose, without transdiscal escarpment or groove. Mesopleuron on outer disc with numerous moderate-sized punctures separated by distances about equal to their average diameter; secondaries almost absent. Legs black. Hind tibia on inner face with naked streak broadened apically, usually not sharply carinate; sensorium clavate. Tegula not shagreened; with short anterior and posterior marginal grooves not connected at outer apical corner. Forewing with hyaline membrane; first section of radius with backward directed spur extending more than half way across first cubital cell, in 3 or 4 examined only faintly sclerotized; radial cell in lateral extension scarcely equal to second cubital cell, its apex narrow; sectors of second cubital cell in terms of inner sector (itob) are 10:26:18:22.

Dorsal propodeum shallowly reticulate outside areola and on area about as large. Lateral propodeum with moderate numbers of well-separated rugulae present into caudal corner. Posterior propodeum with numerous fine rugulae arising from transverse carina. Tergum 1 without transverse carina; preapical band not impressed, without escarpment on anterior border, about 2 punctures wide. Terga 3 and 4 without encircling escarpments or grossly enlarged punctures; posterior punctures at least medially are far removed from apices and not aligned in a close, regular row. Sternum 5 without lateral denticles.

Length 11.0 to 11.7 mm.

FEMALE.—Unknown.

PARATYPE.—1; same data as holotype (CAS).

77. *Tiphia (Tiphia) meridionalis* Turner

Tiphia meridionalis Turner, 1908: 128.—Turner 1911: 619.—Allen 1962: 71.

Tiphia platensis Brethes, 1910: 255.—Turner 1911: 619.

The descriptive notes below are based on a re-description of the holotype female (Allen 1962). *T. meridionalis* has most of the characters of *T. parkeri*. However, it lacks the mandibular denticle, and possesses an unusual spur near the terminus of the radial cell directed forward toward the costal margin. All the females of the type series of *T. parkeri* have a conspicuous preapical denticle, and in most there is no trace of an anteriorly directed spur near the tip of the radial cell. I have not been able to confirm the synonymy proposed by Turner.

HOLOTYPE.—♀; Argentina (Dr. Burmeister) B. M. type Hym. 15.1195 (BM).

FEMALE.—Front with punctures of first degree density to level of lowest ocellus except for a conspicuous median vitta extending from lowest ocellus to base of antenna; secondaries lacking. Cheek covered with mat of white hairs. Dorsum of pronotum without transverse carina, coarsely punctate, with only a few interspaces greater than average diameter of primary punctures. Mesopleuron on outer disc with coarse primary punctures of first- and second-degree density, and a few interspersed secondaries. Scutum with anteromedian escarpment and notaules not connected. Legs black. Hind tibia on inner face with well-developed carina; sensorial area reddish. Hind basitarsus with long, deep groove. Tegula shagreened at apex, without trace of marginal groove. Forewing

with membrane faintly infumated; radius with spur mesad of apex of second cubital cell directed perpendicularly to costal margin.

Dorsal propodeum lateral to areola smooth except for faint shagreening and scattered microscopic punctures; areola keystone-shaped, its length about one and one-half and base one and one-third times apical width; median carina expanded. Side of propodeum on upper part with closely spaced rugulae. Tergum 1 with strongly developed transverse carina; preapical band of large, discrete punctures, chiefly 2 punctures wide and not impressed. Tergum 3 with lateral impunctate areas. Pygidium finely rugose punctate on basal half.

Length 12 mm.

MALE.—Unknown.

I have tentatively placed in *T. meridionalis* the following specimens: 3; San Pedro, Buenos Aires, Argentina, I-1956 (Fritz) (CAS). 2; "Nova" Teutonia Brazil, 27°11'S by 52°23' W, 300 to 500 m, XII-1966 (Fritz Plaumann) (CNC). 1; same data as previous 2 except collected 3-II-1951 (UK). 1; "Nova" Teutonia, Santa Catarina, Brazil, 20-VII-1955 (Fritz Plaumann) (CU). 1; "Corupa," Santa Catarina, Brazil, VI-1948 (A. Maller) (AMNH). None of these have the cusped mandible found in all the type series of *T. parkeri*. Neither do they have the forward directed spur arising near the apex of the second cubital cell found in the type of *T. meridionalis*. This is sometimes an individual aberration, and I am assuming it may be so in the holotype of *T. meridionalis*.

78. *Tiphia (Tiphia) makdona*, new species

T. makdona belongs to a relatively small group from southern South America in which the hind basitarsus is grooved and tergum 1 has no anterior transverse carina. It is distinguished by having a low but complete transverse carina on the pronotum, a pygidium which is impunctate only on apical fourth to one-third, and in the absence of the usual mitral-shaped enclosure around the spiracle of the dorsal propodeum.

HOLOTYPE.—♀; "Makdonado," Uruguay, "swept" (Parker) (USNM).

FEMALE.—Front with punctures almost everywhere of first-degree density, slightly more widely separated on upper half. Antennal flagellum stout, first 3 joints 2.7 times as long as greatest width (3 measured were

2.8, 2.7, 2.7). Clypeal extension with narrow margin; lateral carina long and conspicuous. Mandible without preapical cusp.

Dorsal pronotum with low, crooked but complete transverse carina; punctate part with many median-sized punctures only slightly concentrated apically. Lateral pronotum with anterior process sharply crested to ventral corner where there are faint, irregular rugulae; without groove across disc. Scutum with short anteromedian escarpment broadly separated from notaulices. Mesopleuron on anterior face shagreened, with coarse primary punctures separated in most directions by much less than their average diameter, mixed with large secondaries which are about as numerous as primaries; subtegular patch of microsetae as wide as tegula. Legs black. Tibia without sharp carina on inner face; Upper margin not strongly arched; sensorium flush with surrounding surface. Hind basitarsus grooved. Tegula broadly but very finely shagreened; a fine groove on outer margin terminating at ventral corner. Forewing with membrane almost hyaline; stigma slightly longer than distance separating it from basal vein; first section of radius with short, rudimentary, backwardly directed spur; terminal section without spur.

Dorsal propodeum without mitral-shaped enclosure, or innermost of parallel lateral carinae; areola with straight, nearly parallel sides, scarcely twice as long as apical width. Lateral propodeum with very many closely spaced rugulae; lower part with short, inconspicuous microsetae on narrow belt bordering metacoxal cavity. Tergum 1 broadly bipunctate on anterior slope, the median primaries very small; without transverse carina; preapical band not impressed, of small, well-separated punctures, 1 to 2 punctures wide. Sternum 2 with median callosity. Pygidium punctate on basal three-fourths; impunctate apex finely shagreened, and roughened with pattern of concentrically ringed wrinkles.

Length 12.5 to 15.7 mm.

MALE.—Unknown.

PARATYPE.—1; same data as holotype (USNM).

The specimens listed above are part of the Tiphinae reared or collected by the United States Department of Agriculture laboratory formerly located at Montevideo. In the process of relaxing, some of the labeling has become illegible.

79. *Tiphia (Tiphia) margareta*, new species

The presence of a groove on the basitarsus and absence of a transverse carina on tergum 1 places this species in a relatively small group. It differs from *T. makedona* in not having a complete transverse carina on the dorsal pronotum, and in having a well-defined mitral-shaped enclosure about the propodeal spiracle. It differs from *T. gigantea* in being a much smaller species, and in not having interspaces between punctures of dorsal pronotum as wide as an ocellus. *T. margareta* is also distinguished in most specimens by an obscure anteromedian callosity on sternum 2.

HOLOTYPE.—♀; "Nova" Teutonia, Brazil, 27° 11'S by 52° 23'W, 300 to 500 m, January 1967 (Fritz Plaumann) (CNC).

FEMALE.—Front with very coarse, deep, contiguous punctures to level of lowest ocellus. Clypeus with extension perceptibly bidentate; lateral carina long and thin. Mandible without preapical denticle.

Dorsal pronotum without transverse carina; punctures coarse and perceptibly concentrated in a band terminating the punctate part. Lateral pronotum with numerous strong rugulae in ventral corner; without groove across disc. Scutum with anteromedian escarpment not connected with notaulices, medially with plaque of nearly contiguous primary punctures and obscure interspaced micropunctures. Mesopleuron on outer disc with numerous primary punctures of first- or second-degree density; subtegular patch of dense micropunctures narrower than tegula. Hind tibia on inner face with a distinct ridge, flattened around the sensorium which is pyriform and about twice as long as wide. Hind basitarsus with a well-defined groove. Tegula polished to obscurely shagreened; without marginal grooves. Forewing with membrane heavily infumated; radius without sharp angle or spur in first section, apically usually without a spur; stigma separated by its length from basal vein.

Dorsal propodeum with sharply defined mitral-shaped depression; areola usually widest just posterior to base and 2 to 3 times as long as apical width. Tergum 1 without anterior transverse carina; preapical band a single irregular row of coarse, slightly impressed punctures separated by less than their average diameter. Intermediate terga with punctures moderately coarse and of fairly uniform size but strongly

concentrated in front of and behind broad impunctate area, with apices impunctate in middle area for distance about equal to 3 of the largest adjacent punctures. Pygidium densely punctate on basal half, with a small, obscure median emargination; impunctate part only obscurely fine shagreened near punctate part.

Length 8.6 to 13.5 mm.

MALE.—Not known.

PARATYPES.—7 from same locality as holotype: 1, February 1965; 2, February 1966; 1, 14-I-1967; 1, 10-III-1967; 2, March 1967. (All collected by Fritz Plaumann) (CNC). 3; "Uruoum," Corumba, Brazil, Cornell University Expedition Lot 569, 23/29-XII-1919 (CU). 1; "Nova" Teutonia, Santa Catarina, Brazil, 5-II-1957 (F. Plaumann) (CU). 1; "Cauna," Santa Catarina, Brazil, XII-1945 (A. Maller) (AMNH). 1; near Montevideo, Uruguay (USNM). 1; "Passanti," Uruguay, reared from Scarabeidae (Silveira) (USNM). 1; "Sierra Paz," "Carlos" de Cordoba, Argentina, 800 m, 22-III-1951 (Foerster) (UK). 5; Brazil (Sello) (ZMB).

80. *Tiphia (Tiphia) gigantea* Turner

Tiphia gigantea Turner, 1911: 307.

Turner described this species from 2 females in the Zoologische Museum der Humboldt-Universität in East Berlin which he states were taken at Petropolis, Brazil, in August and October. These specimens were generously lent to me by Dr. Konigsmann of the Berlin Museum in August, 1970, and the following redescription prepared. I find that the smaller specimen bears the type label. When examined by me the date and locality label were missing. The specimen does bear a green label in common with the larger specimen, having the following information "Brasilien/ E. Ohaus S.V." The second, much larger specimen was designated "cotype" by Turner. It was collected at Petropolis, Brazil, on October 10, 1898. Turner does not specify how many specimens were included in his type series. The context indicates there must have been at least two, and since the cotype has the October label, it is probably safe to assume that when Turner described the species, the type specimen had the date and locality label of August, Petropolis, Brazil. Although the type specimen is much smaller than the "cotype," and differs in several minor

characters, on the basis of the limited existing material I do not consider them different species. The "cotype" specimen has a broader areola, and the impunctate apex of the pygidium is crossed by about 17 parallel rugulae extending nearly to its apex. Its resemblance to the North American *T. inornata* series noted by Turner, is confined to its large size. Several South American species are known which are as large as the holotype of *T. gigantea* but have easily recognized structural differences. The fact that *T. gigantea* has a groove on the hind basitarsus and no transverse carina on tergum 1 restricts it to a small group. It differs from *T. margareta* in having no trace of a median callosity on sternum 2 and in possessing numerous longitudinal wrinkles on impunctate apex of the pygidium.

HOLOTYPE.—♀; Petropolis, Brazil (according to original description) (ZMB).

FEMALE.—Front with punctures on upper half irregularly distributed with plaques of first-degree density alternating with several interspaces about as wide as an ocellus. Antennal flagellum slender, first 3 joints 3.3 times as long as greatest width. Mandible without preapical cusp.

Dorsal pronotum with transverse carina well-developed except on median third; punctures small and generally separated by much more than their average diameter except for an arched band of contiguous ones across middle. Lateral pronotum with numerous small elongate punctures on upper half, and a narrow groove across disc. Scutum with notaulices and antero-median groove barely connected. Mesopleuron on anterior aspect with small punctures separated in all directions by more than their average diameter, and with secondaries at least twice as numerous as primaries; subalar patch of dense micropunctures narrower than tegula. Legs black. Hind tibia not arched on upper margin, with perceptible carina on inner face. Hind basitarsus grooved. Forewing strongly infumated; stigma very small, separated by less than its length from basal vein.

Dorsal propodeum with areola almost rectangular, about 3 times as long as apical width. Lateral propodeum with rugulae coarse and widely spaced; lower part with very short, inconspicuous microsetae. Posterior aspect of propodeum without median carina. Tergum 1 without anterior transverse carina; preapical band not impressed, and consisting of an irregular row of small primary punctures, not impressed and

coalesced in places. Sternum 2 without median callosity. Intermediate terga with conspicuous impunctate patches on each side of median line. Pygidium closely elongate punctate on basal half; apical half (in type) with several wrinkles close to punctate part, not shagreened.

Length 15.0 to 18.8 mm.

MALE.—Not known.

PARATYPE.—Petropolis, Brazil, 10-X-1898 (ZMB).

81. *Tiphia (Tiphia) elongata* Turner

Tiphia elongata Turner, 1908: 129.—Allen 1962: 68.

T. elongata is known only from the type specimen. The descriptive notes below are based on a recent redescription of the type (Allen 1962). Species of *Tiphia* in South America vary considerably in slenderness, but the author has seen none in which the female is as slender as *T. elongata*. In most species the ratio of propodeal length to width is near unity, but in *T. elongata* it is 1.4. *T. elongata* resembles the majority of *Tiphia* from southern South America in having no groove on the hind basitarsus.

HOLOTYPE.—♀; Theresopolis, Brazil, B.M. type no. Hym. 15.1193 (BM).

FEMALE.—Front on upper half with impunctate interspaces as wide as an ocellus. Dorsal pronotum with transverse carina faintly developed across middle; punctures concentrated along transverse carina and in band near impunctate apex, with impunctate spaces in intermediate area as wide as an ocellus. Lateral pronotum with fine aciculations in ventral angle, without groove across disc. Mesopleuron on outer disc with a few widely separated punctures. Scutum with anteromedian escarpment and notaulices connected. Legs chiefly black. Hind tibia not carinate on inner face, with lower and upper margins nearly parallel, 2.1 times as long as middle width. Hind basitarsus without groove. Tegula reddish translucent, without marginal grooves. Radius with an outwardly directed terminal spur; radial cell 3.6 times as long as wide.

Dorsal propodeum with its medial length 1.4 times its greatest width; lateral sulcus narrow, about 6 times as long as wide; areola with its length 3 times and its width three-fourths times basal width. Lateral propodeum with very fine rugulae; lower part almost bare and very faintly shagreened. Posterior propodeum

with thin median carina on lower half. Tergum 1 without anterior transverse carina; preapical band consists of fine punctures irregularly one row wide, discrete, not impressed. Terga 2 and 3 with punctures extremely fine and sparse; impunctate apices as wide or wider than hind basitarsus. Pygidium finely punctate on basal half; apex smooth, polished.

Length 9.5 mm.

MALE.—Unknown.

82. *Tiphia (Tiphia) selloi*, new species

T. selloi is described from a single female specimen which has no exceptional characters. The lack of a groove on the hind basitarsus, and presence of a well-defined transverse carina on the first tergum, places it in the key with the couplet which includes 2 unrelated species, *T. walzi* and *T. cordobae*, from which it differs in having an anteromedian escarpment on the scutum.

HOLOTYPE.—♀; Brazil (Sello) (ZMB).

FEMALE.—Front with coarse punctures, contiguous on lower third, thinning to second-degree density on upper third, without interspaces as wide as an ocellus.

Dorsal pronotum without transverse carina; punctures coarse, uniform in size and of first-degree density. Lateral pronotum with fine aciculations in ventral corner; with a narrow groove across disc. Scutum with anteromedian escarpment and notaulices not connected. Mesopleuron on anterior aspect with punctures of nearly uniform size and everywhere of close first-degree density; subtegular patch of dense microsetae as wide as tegula. Legs black. Hind tibia on inner face carinate; sensorium clavate, about 3 times as long as wide, and one-fourth as wide as joint. Hind basitarsus not grooved. Tegula without shagreening, or groove on outer margin. Forewing moderately infumate; stigma separated by more than its length from basal vein; radius with rudimentary backward directed spur on its first section, without apical spur.

Dorsal propodeum, and especially the areola with fine, scale-like shagreening; areola with concave sides, its length about two and one-fourth times apical width. Lateral propodeum with rugulae numerous and closely spaced, lower part with pile short and inconspicuous. Tergum 1 with anterior transverse carina consisting of a thin, wavy, unbroken line; preapical band of moderate-sized punctures in middle separated by more than their average diameter, and not impressed. Inter-

mediate terga with relatively dense, moderate-sized punctures of relatively uniform size and distribution. Sternum 2 without anteromedian callosity. Pygidium punctate on basal three-fifths, with a conspicuous median emargination; apex glossy, not wrinkled or shagreened.

Length 12.6 mm.

MALE.—Unknown.

83. *Tiphia (Tiphia) cordoba*, new species

FIGURE 36

In *T. cordoba* the presence of a transverse carina on tergum 1, the absence of a groove on the hind basitarsus and of an anteromedian escarpment on the scutum, serve to couple this species with *T. walzi*. Only a very few female *Tiphia* are known in which the scutal escarpment is lacking. In other respects these two species do not resemble each other. *T. cordoba* has no trace of the apical bands of tergal bristles, such a conspicuous feature of *T. walzi*. Known only from holotype specimen.

HOLOTYPE.—♀; "Cosquin, Sierra de Cordoba," Argentina, 1/9-III-1920 (CU).

FEMALE.—Front on upper two-thirds with punctures largely in short, irregular, well-separated rows with 1 or 2 interspaces as wide as an ocellus. Mandible without preapical denticle.

Dorsal pronotum with complete transverse carina, strongly developed except on median third. Lateral pronotum with parallel rugulae in ventral angle; without groove across disc. Scutum (Figure 36) without trace of anteromedian escarpment; disc sparsely punctate except for small densely bipunctate plaque medially at apex. Mesopleuron on outer disc coarsely punctate, the punctures separated from slightly less to slightly more than their average diameter, without secondaries; subtegular patch of dense micropunctures slightly narrower than tegula. Legs piceous. Hind tibia not arched on upper margin; inner face with a narrowly triangular naked area, apically surrounding a large, reddish, slightly sunken sensorium. Hind basitarsus without groove. Tegula reddish translucent, without shagreening or marginal grooves. Forewing with slightly infuscated membrane; stigma separated by less than its length from basal vein; radius without terminal spur.

Dorsal propodeum outside areola faintly shagreened, with scattered minute punctures; areola with

entire enclosed area uniformly minute punctate, length about 2 times and basal width about one and one-eighth times apical width. Lateral propodeum with coarse, widely separated rugulae; lower part with only scattered microsetae. Tergum 1 with complete, sharp-crested transverse carina; preapical band of coarse punctures, the posterior medial ones discrete, medially about two punctures wide, anterior border with a well-defined escarpment. Intermediate terga without broad apical band of white bristles; punctures rather dense and relatively uniform in size and distribution. Pygidium punctate on upper three-fourths; impunctate apex polished, wrinkled near punctate part.

Length 8.5 mm.

MALE.—Unknown.

84. *Tiphia (Tiphia) michelbacheri*, new species

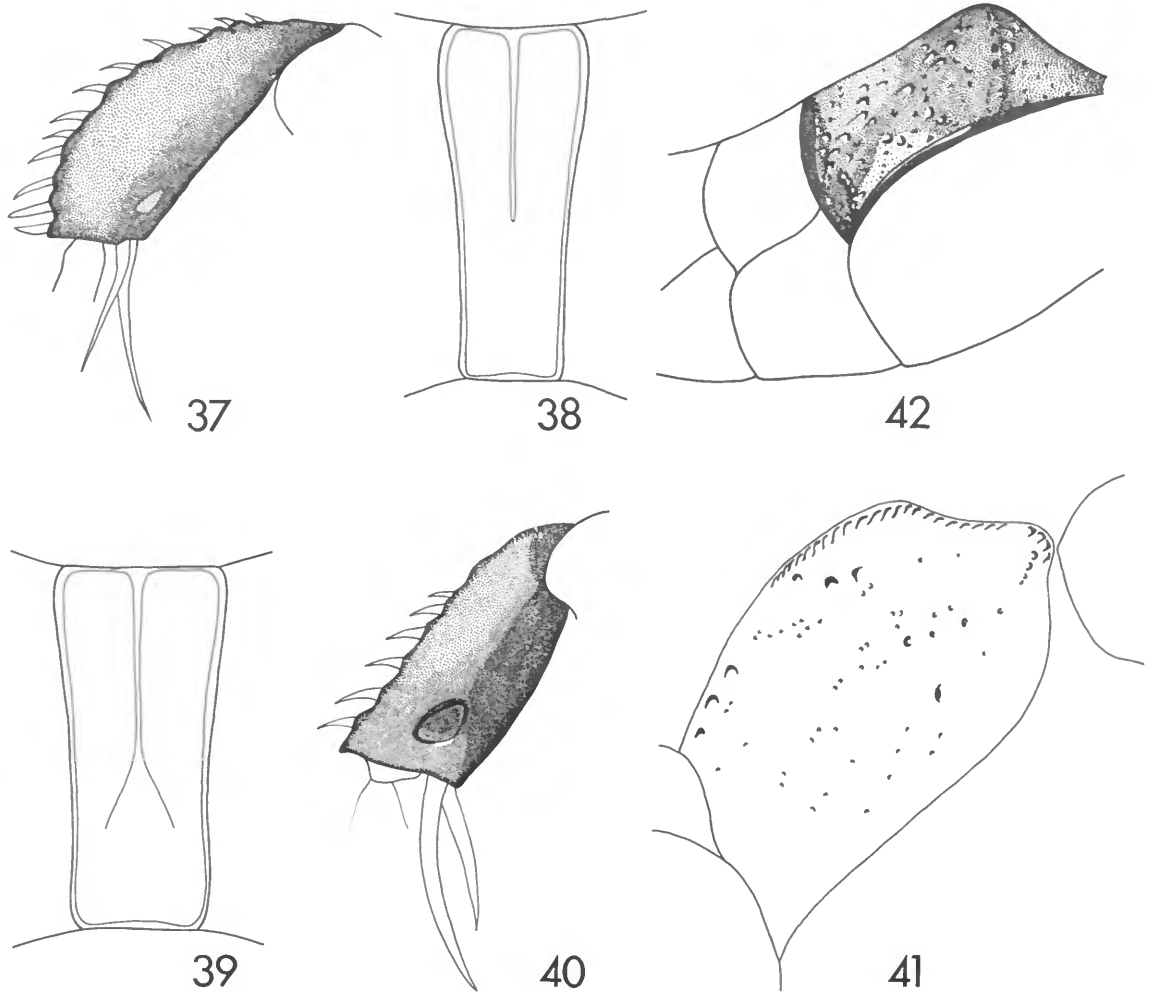
FIGURE 37

T. michelbacheri is described from the holotype and 2 paratypes from Argentina and southern Brazil. It belongs to a group in which the basitarsus is not grooved, the first tergum has no transverse carina and its preapical band is bordered anteriorly by an escarpment. It differs most distinctly from other species in this group in having conspicuously inflated tibiae.

HOLOTYPE.—♀; Salta, Argentina, 14-II-1951 (Ross and Michelbacher) (CAS).

FEMALE.—Front on upper half with coarse punctures irregular in size and distribution, largely of first- or second-degree density, and except for a median vitta, without interspaces as wide as an ocellus. Mandible without preapical denticle.

Dorsal pronotum without trace of transverse carina; punctures a mixture of coarse primaries and secondaries, large and minute, nowhere of first-degree density except in band terminating punctate part. Lateral pronotum almost free of sculpturing except for weak aciculations in ventral angle. Scutum with anteromedian escarpment and notaulices not connected. Mesopleuron on outer disc with many coarse punctures of first-degree density; subtegular patch of dense micropunctures wider than tegula and continued along prepectal suture almost to ventral aspect. Legs black. Femora (Figure 37) of all legs conspicuously inflated on outer surface. Hind tibia with upper margin strongly arched; inner face without ridge; sensorium clavate, small, about one-sixth width of inner face.



FIGURES 37-42.—37, Female of *Tiphia michelbacheri*, new species, from Salta, Argentina, hind tibia. 38, female of *Tiphia parana*, new species, from "Rolaudia," Parana, Brazil, areola. 39, female of *Tiphia shannoni*, new species, from Petropolis, Brazil, areola. 40, female of *Tiphia tucumanae*, new species, from San Pedro de Colalao, Argentina, hind tibia showing sunken sensorium. 41, female *Tiphia malleri*, new species, from "Corupa," Santa Catarina, Brazil, showing sparsely punctate mesopleuron. 42, female of *Tiphia inusitata*, new species, from Sao Paulo, Brazil, sternum 2 showing keel-shaped callosity.

Hind basitarsus without groove. Tegula without shagreening or groove on outer margin. Forewing with membrane moderately infumate; stigma separated by less than its length from basal vein; radial cell without apical spur.

Dorsal propodeum unusually slender, its length about 3 times, and its base about one and one-half

times apical width. Lateral propodeum with rugulae very fine, numerous, and closely spaced; lower part with inconspicuous fringe of microsetae bordering metacoxal cavity. Tergum 1 without anterior transverse carina; preapical band a groove with an escarpment on anterior border and with only a few minute and widely separated punctures on middle part. Py-

gidium punctate on basal half, punctures terminating on a straight line interrupted by a distinct emargination; impunctate apex free of shagreening or wrinkles.

Length 10.1 to 11.7 mm.

MALE.—Unknown.

PARATYPES.—1; San Pedro de Colalao, Tucuman, Argentina, 9-II-1947 (J. M. Arnau) (USNM). 1; Lassanos, Minas Gerais, Brazil, 9/19-XI-1919, Cornell University Expedition Lot 569 (CU).

85. *Tiphia (Tiphia) parana*, new species

FIGURE 38

The absence of a basitarsal groove, or a transverse carina on tergum 1, and the reduction of the preapical band of tergum 1 to a smooth almost impunctate groove limits this species to a small group. *T. parana* differs strikingly from *T. michelbacheri* in having tibiae that are not inflated on the outer margin. It has a much narrower propodeal areola than *T. shannoni*, the rugulae of the lateral propodeum are more closely spaced, and the preapical punctures of terga 2 and 3 are not confined to a single linear row.

HOLOTYPE.—♀; "Rolaudia," Parana, Brazil, November 1947 (A. Maller) (AMNH).

FEMALE.—Front bipunctate with its large secondaries more numerous than the primaries on upper two-thirds, with many interspaces wider than an ocellus. Mandible without preapical denticle.

Dorsal pronotum with an obscure transverse carina, absent on median third; most of primary punctures in an irregular band across middle, in front of which the punctures are principally widely separated secondaries. Lateral pronotum without rugulae or transdiscal groove. Scutum with anteromedian escarpment not connected with notaulices. Mesopleuron on outer disc with only a few very small, widely separated primary punctures and about an equal number of slightly smaller secondaries; subtegular patch of dense micropunctures as wide as tegula, not continued ventrally along prepectal suture. Hind tibia with inner face angular in cross section but without a well-defined carina; sensorium flush with surrounding surface, one-half as wide as tibia, and not longer than broad. Hind basitarsus not grooved. Tegula glossy, without marginal grooves. Forewing with moderately infumate membrane; stigma separated by more than its length from basal vein.

Areola (Figure 38) of dorsal propodeum keystone-shaped with straight, slightly converging sides, length 4 times apical width. Lateral propodeum with rugulae of upper part very numerous and closely spaced but not evanescent; lower part glossy, with only sparse microsetae. Tergum 1 largely impunctate with usual preapical band of punctures lacking, but in its place a narrow groove in which there are no punctures. Terga 2 and 3 each with a preapical row of punctures of assorted sizes separated medially from apices by 3 to 4 times widths of largest punctures. Pygidium with punctures on basal half, widely separated apico-medially; impunctate apex glossy without shagreening.

Length 9.6 mm.

MALE.—Unknown.

86. *Tiphia (Tiphia) shannoni*, new species

FIGURE 39

This species with *T. saltaensis*, and *T. parana* have a distinct escarpment bordering the preapical band of the first tergum. In *T. shannoni* the groove bordering the preapical escarpment of the first tergum is deeper and narrower than in *T. saltaensis* and the tibiae are not inflated. *T. shannoni* differs in several characters from *T. parana* but most obviously in the shorter, broader propodeal areola and the puncturation of the mesopleuron.

HOLOTYPE.—♀; Petropolis, Rio de Janeiro, Brazil, III-1938 (R. C. Shannon) (USNM).

FEMALE.—Front with median-sized punctures of first-degree density on lower third and along eyes, medially principally of second-degree without interspaces as wide as an ocellus. Mandible without preapical denticle.

Dorsal pronotum with vestige of transverse carina at humeral angle; punctures nearly uniform in size and distribution, largely of first-degree density. Lateral pronotum with only faint aciculations in ventral angle; a short, curved, often obscure groove on middle disc. Scutum with anteromedian escarpment and notaulices not connected. Mesopleuron on outer disc with very small primary punctures separated in most directions by several times their average diameter and mixed with secondaries ranging in size down to micropunctures and much more numerous than primaries; subtegular patch of dense micropunctures wider than tegula and extending downward along prepectal suture

to far below its angle. Legs largely black. Hind tibia not inflated, or arched on upper margin, its inner face carinate; sensorium nearly as broad as long, about one-fourth width of joint. Hind basitarsus without groove. Tegula highly polished, without groove on anterior margin. Forewing with slightly infumate membrane; stigma separated by less than its length from basal vein; radius without spur at its apex.

Dorsal propodeum lateral to areola highly polished, without sculpturing; areola (Figure 39) widest posterior to base where it is about one and one-third times apical width, length less than 3 times apical width. Lateral propodeum with rugulae relatively coarse and widely spaced; lower part with sparse fringe of microsetae near coxal cavity. Tergum 1 with dorsum nearly impunctate, and without transverse carina; preapical band a deep, narrow groove with a high escarpment on anterior border and a very indistinct row of minute punctures posteriorly (usually visible only, when viewed from in front). Terga 2 and 3 with preapical punctures not of uniform size nor arranged in a narrowly linear row. Pygidium punctate on basal half; impunctate apex polished, without wrinkles.

Length 9.8 to 13.4 mm.

MALE.—Unknown.

PARATYPES.—1; same data as holotype. 1; "Nova" Teutonia, Brazil, 27°11'S by 52°23'W, 300 to 500 m, I-1957 (Fritz Plaumann) (CNC). 1; "Monat," Brazil, IV-1913 (P. Hartig) (USNM).

The data on the third paratype is scarcely legible.

87. *Tiphia (Tiphia) tucumanae*, new species

FIGURE 40

T. tucumanae runs in the key to a group of 5 species in which there is no transverse carina on tergum 1, the hind basitarsus is not grooved and the preapical band is not impressed and consists of medium-size punctures. In this group *T. tucumanae* can be readily distinguished by the metatibial sensorium which is a deep pit, and the exceptionally long, slender propodeal areola. The strong connection between the anteromedian escarpment and the notaulices is also unusual.

HOLOTYPE.—♀; San Pedro de Colalao, Tucuman, Argentina, I-1953 (F. H. Walz) (UK).

FEMALE.—Front on upper half bipunctate with moderate numbers of large secondary punctures, and of second-degree density, with interspaces as wide as an ocellus.

Dorsal pronotum with transverse carina faintly developed on lateral third; bipunctate, the punctures of first-degree density medially and in a lateral band extending to base of tegula, broadly sparse punctate on lateral discs. Lateral pronotum with anterior process from humeral angle downward broadly rounded; devoid of rugulae or transdiscal groove. Scutum with anteromedian escarpment strongly connected with notaulices; with median plaque of coarse punctures. Mesopleuron on outer disc with only a few widely spaced primary punctures, and somewhat more numerous secondaries of assorted sizes; subtegular patch of micropunctures as wide as tegula and not extended ventrally along prepectal ridge. Legs entirely black. Hind tibia (Figure 40) with its inner face carinate; sensorium in a large, deeply sunken pit, scarcely longer than wide and almost half width of tibia. Hind basitarsus without groove. Tegula glossy, without marginal grooves. Forewing slightly infumate; stigma separated by more than its length from basal vein; radius without apical spur.

Dorsal propodeum beside areola finely close punctate; areola with nearly straight sides, narrow, about 5 times as long as apical width. Tergum 1 with dorsal area rather coarsely punctate; preapical band not impressed and consisting of an array of medium-sized punctures, 1 to 2 punctures wide. Intermediate terga with moderate-sized punctures of uniform size and uniform in distribution except for impunctate areas on terga 2, 3, and 4 where terminal punctures medially are widely separated from apices. Pygidium finely rugose punctate on basal half; impunctate half sharply defined and only obscurely shagreened near punctate part.

Length 8.7 mm.

MALE.—Unknown.

88. *Tiphia (Tiphia) malleri*, new species

FIGURE 41

T. malleri is represented only by the holotype specimen and is an unusually large species. It is grouped in the key with 4 other species which are certainly not closely related. It differs from all of these in having its mesopleuron almost devoid of primary punctures. Other identifying characters are the absence of an anterior transverse carina on tergum 1 and a preapical band

which is not bordered anteriorly by an escarpment, and the absence of a groove on the hind basitarsus.

HOLOTYPE.—♀; "Corupa," Santa Catarina, Brazil, X-1945 (A. Maller) (AMNH).

FEMALE.—Front on upper half conspicuously bipunctate with a few large primaries and numerous large secondaries; with several impunctate interspaces much wider than an ocellus. Mandible without preapical denticle.

Dorsal pronotum without trace of transverse carina except at humeral angle; primary punctures sparse on disc but concentrated in a transverse band across middle; with many large secondaries. Lateral pronotum with anterior process everywhere broadly rounded; without rugulae or middiscal groove. Scutum with poorly developed anteromedian escarpment and a median plaque of large punctures. Mesopleuron (Figure 41) with a few widely separated primary punctures on anterior and upper part, outer disc below level of spiracle with no punctures except a few widely separated secondaries; subtegular patch of dense micropunctures much narrower than tegula. Legs entirely black. Hind tibia on inner face without carina but definitely angular in cross section; sensorial area flush with surrounding surface, as broad as apex of basitarsus, scarcely longer than wide. Hind basitarsus without groove. Tegula without shagreening or marginal grooves. Forewing with its membrane strongly infumate; stigma separated by more than its length from basal vein; radius with bend about one-third distance to intercubitus, and terminating in an outwardly directed stump; radial cell 4.1 times as long as wide.

Propodeum with its areola about 3 times as long as apical width, its sides slightly concave, its middle carina linear and nearly complete. Lateral propodeum on upper part with its rugulae fine and closely spaced but not evanescent; lower part with short, sparse, micropile on posterior two-fifths. Tergum 1 on anterior face with a longitudinal crease; without transverse carina; preapical band a single irregular row of punctures of assorted sizes and second-degree density, not impressed. Tergum 2 with only small, widely separated punctures except at apex where there is an irregular terminal row separated from apex by 3 to 4 times width of largest adjacent punctures. Terga 3 and 4 with broad impunctate areas. Pygidium on basal two-thirds closely and finely elongate punctate;

impunctate apex wrinkled and faintly shagreened to apex.

Length 20.8 mm.

MALE.—Unknown.

89. *Tiphia (Tiphia) inusitata*, new species

FIGURE 42

This species is segregated in the key with a small group in which there is no basitarsal groove, no anterior transverse carina on tergum 1, and no escarpment on anterior border of preapical band. In *T. inusitata* there is the unusual combination of closely contiguous punctures of uniform size on the entire front, vertex, anterior dorsal pronotum and scutum. On the anterior part of the second sternum there is a very conspicuous callosity elongated into a rounded keel. None of the other species grouped with it have similar characters.

HOLOTYPE.—♀; Sao Paulo, Brazil, V-1954 (N. L. H. Krauss) (USNM).

FEMALE.—Front and vertex entirely covered with deep, contiguous punctures of uniform size. Antennal flagellum unusually slender, first 3 joints 4.3 times as long as wide. Clypeal extension narrow and prominently bidentate. Mandible without preapical denticle.

Dorsal pronotum without anterior transverse carina, anterior two-thirds entirely covered with closely contiguous punctures of uniform size. Lateral pronotum with faint rugulae; without transdiscal escarpment or groove. Scutum with anteromedian escarpment and notaulices not connected; area enclosed closely set with contiguous primary punctures. Mesopleuron on outer disc with small primary punctures separated by more than their average diameter and at least an equal number of large secondaries; all except ventral aspect densely set with extremely small micropunctures. Legs black. Hind leg slender, its femur 3.3 times as long as greatest width. Hind tibia angular in cross section, its sensorium black, only a fifth as wide as joint, oval and about 3 times as long as wide. Hind basitarsus without groove. Tegula broadly but faintly shagreened; without groove on outer margin. Forewing with membrane and wings near base distinctly flavous; stigma separated by its length from basal vein; radius on first section with a short, backward directed spur, without terminal spur; radial cell elongate, 3.5 times as long as wide.

Dorsal propodeum with areola nearly rectangular, its length two and one-fourth times apical width. Lateral propodeum with rugulae fine but widely separated; microsetae on lower part short and very fine, not masking any part. Tergum 1 without anterior transverse carina; preapical band a single row of coarse, somewhat irregular punctures, not impressed. Sternum 2 (Figure 42) with a very conspicuous median callosity resembling a rounded keel. Intermediate terga almost entirely covered with punctures, the largest of which are very coarse. Pygidium closely punctate on basal two-thirds; impunctate apex glossy.

Length 13.6 mm.

MALE.—Unknown.

90. *Tiphia (Tiphia) annabella*, new species

T. annabella is known only from the holotype. In this species the absence of 3 characters, i.e., the basitarsal groove, anterior transverse carina and the escarpment bordering the preapical band of tergum 1 bring it in the key to a small group of apparently unrelated species. It possesses normal punctation of the mesopleuron, lacks a transverse carina on dorsal pronotum and the usual mitral-shaped enclosure of the spiracle on the dorsal propodeum.

HOLOTYPE.—♀; "Nova" Teutonia, Brazil, 27° 11'S, 52° 23'W, 300 to 500 m, II-1965 (Fritz Plaumann) (CNC).

FEMALE.—Front on upper half with punctures chiefly of second-degree density; without interspaces as wide as an ocellus except for one spot on upper part of median vitta. Mandible without preapical denticle.

Dorsal pronotum without anterior transverse carina; with coarse punctures of generally uniform size and distribution and principally of first-degree density. Lateral pronotum with anterior process broadly rounded on lower half; disc nearly flat, with scattered punctures above and plaque of aciculations in ventral corner; without transdiscal groove. Scutum with anteromedian escarpment not connected laterally with notaulices; medially a plaque of well-separated primary punctures interspersed with many minute punctures. Mesopleuron on outer disc with widely separated primary punctures and about an equal number of large secondaries; subtegular patch of dense micro-punctures about as wide as tegula. Hind tibia with

inner face slightly carinate; sensorium about one-fourth as wide as joint, elongate pyriform, slightly depressed below surrounding rim and more than twice as long as wide. Hind basitarsus without groove. Tegula faintly shagreened, without groove on outer margin. Forewing strongly infumate; stigma separated by its length from basal vein; radius with a short spur at bend of first section; without terminal spur.

Dorsal propodeum with mitral-shaped depression about spiracle obsolete; areola with nearly straight sides and convex apex, length slightly more than 2 times and base one and one-eighth apical width. Tergum 1 without anterior transverse carina; preapical band a single row of extremely fine punctures irregularly spaced but generally separated by more than their average diameter and not impressed. Intermediate terga coarsely punctate with primaries of nearly uniform size, terga 3 and 4 with conspicuous impunctate areas, terga 2 to 5 laterally with apical rows of somewhat irregular bristles. Pygidium punctate on basal half, the punctures terminating in a nearly straight transverse line interrupted by a median emargination; impunctate part shagreened on anterior half, polished apically.

Length 13.0 mm.

MALE.—Unknown.

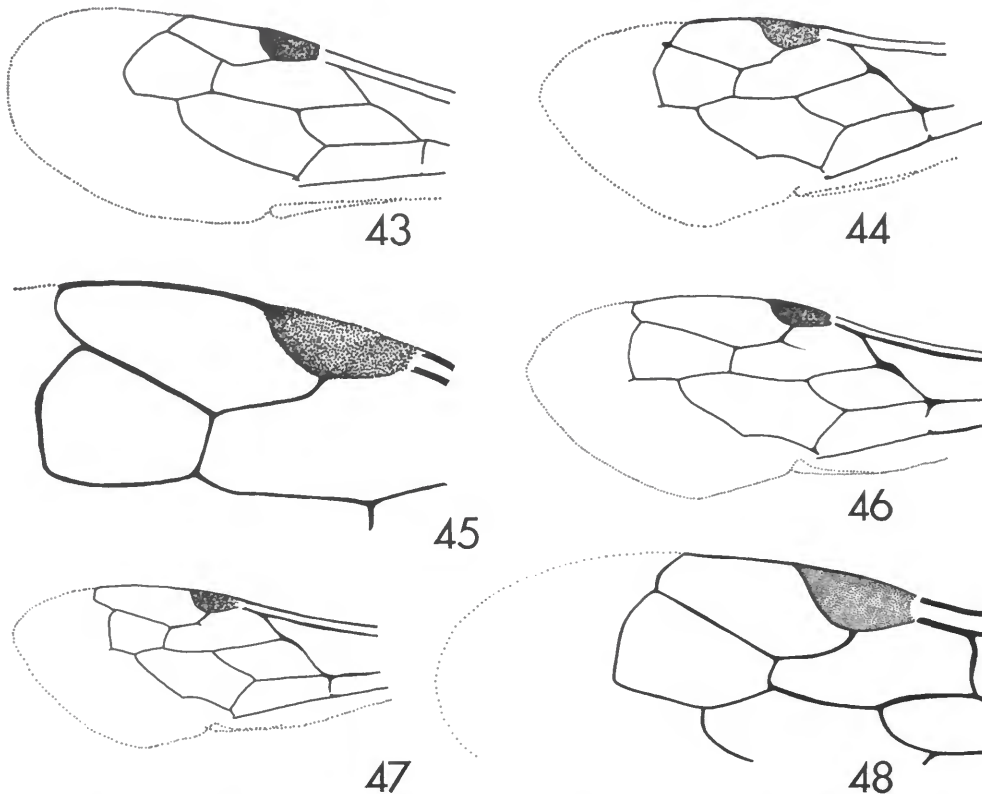
91. *Tiphia (Tiphia) corumba*, new species

The outstanding characters of this species are the complete transverse carina of the dorsal pronotum, the shagreened tegula and apex of the pygidium, and the expanded median carina of the propodeal areola. It is a member of a group that has no groove on the basitarsus, no anterior transverse carina or escarpment bordering the preapical band. This species differs in only small characters from *T. bassleri* from Peru.

HOLOTYPE.—♀; "Uruoum," Corumba, Brazil, 23/29-XII-1919, Cornell University Expedition Lot 569 (CU).

FEMALE.—Front on upper two-thirds with punctures irregularly distributed in small plaques or rows of first- or second-degree density without interspaces as wide as an ocellus. Mandible without preapical denticles.

Dorsal pronotum with transverse carina very low but complete; punctures concentrated anteromedially and in transverse band terminating punctate part; impunctate part medially twice as wide as punctate

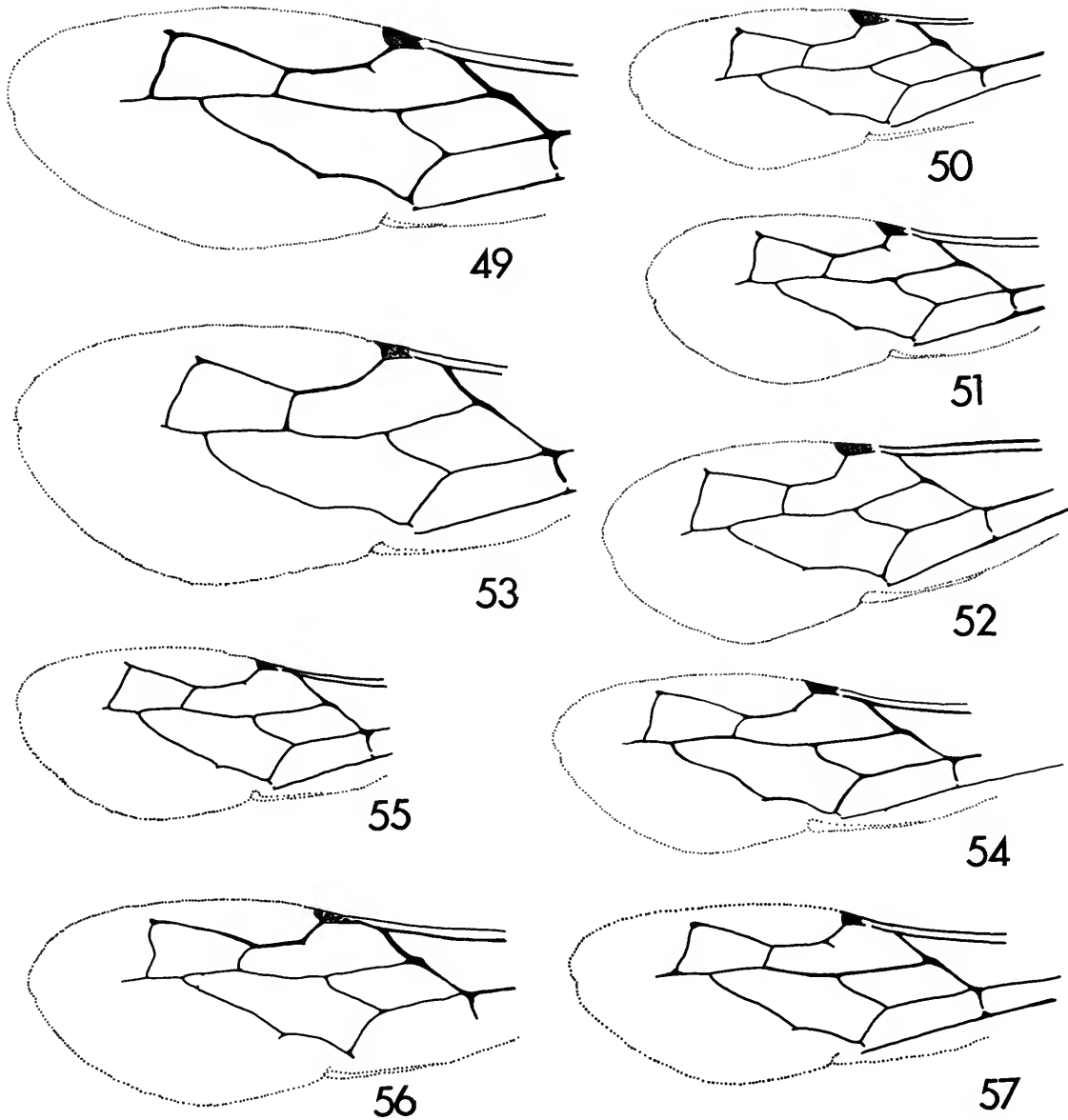


FIGURES 43-48.—Male forewings: 43, *Mallochia arnau*, new species, from San Pedro de Colalao, Argentina; 44, *Tiphia paupi* Allen and Krombein from Sevilla, Colombia; 45, *T. boxi*, new species, from La Vega, Venezuela; 46, *T. rossi*, new species, from Fresno, Tolima, Colombia; 47, *T. paco* Allen from Panama Canal Zone; 48, *T. sierra*, new species, from "Cosquin Sierra de Cordoba," Argentina.

part. Lateral pronotum without groove across disc; with faint rugulae in ventral angle. Mesopleuron on anterior slope with coarse primary punctures usually separated by slightly more than their average diameter; at least an equal number of secondaries of assorted sizes; subtegular patch of dense microsetae wider than tegula. Hind tibia on inner face strongly carinate; sensorium pyriform, about one-fourth as wide as joint. Hind basitarsus without groove. Tegula faintly but broadly shagreened, without groove on outer margin. Forewing moderately infusate; stigma separated by much more than its length from basal vein; first section of radius with conspicuous, inwardly directed spur; radial cell without terminal spur, about 4.1 times as long as wide.

Dorsal propodeum with inner carina of mitral-

shaped depression conspicuously sigmoid; areola subrectangular, scarcely more than twice as long as wide, its median carina expanded and sometimes arborescent. Lateral propodeum with rugulae moderately strong, numerous, and closely spaced; lower part with microsetae bordering posterior coxal cavity, thinning out above and cephalad. Tergum 1 without transverse carina; anterior face with large patch of micropunctures; preapical band is a single row of punctures, somewhat irregularly spaced to intervals less than an average puncture diameter, not impressed. Intermediate terga with rather coarse punctures, not varying much in size and density of distribution except for polished impunctate areas on terga 3 and 4. Pygidium with basal half coarse, shallow, elongate punctate; impunctate part strongly shagreened almost to apex.



FIGURES 49-57.—Female forewings: 49, *Tiphia huallaga*, new species, from "Anduze," Venezuela; 50, *T. monsona*, new species, from Monson Valley, Peru; 51, *T. browni*, new species, from Rio Pastaza, Ecuador; 52, *T. scalariformis*, new species, from Monson Valley, Peru; 53, *T. quincemila*, new species, from Quincemil, Peru; 54, *T. iquitosa*, new species, from Iquitos, Peru; 55, *T. putumayoa*, new species, from Putumayo District, Peru; 56, *T. academiae*, new species, from Monson Valley, Peru; 57, *T. bassleri*, new species, from Tumupasa, Bolivia.

Length 12.3 to 15.1 mm.

MALE.—Unknown.

PARATYPES.—1; same data as holotype (CU). 1; same locality as holotype, 23/29-XII-1919 (R. C. Harris) (CU).

92. *Tiphia (Tiphia) tonia*, new species

This species known only from holotype. It runs in the key to a group having no groove on the hind basitarsus, no anterior transverse carina on tergum 1 and no escarpment bordering the preapical band. It has a perceptible transverse carina on the dorsal pronotum, a scutum on which the anteromedian escarpment and the notaulices are strongly connected, and impunctate spaces on the front as wide as an ocellus.

HOLOTYPE.—♀; "Nova" Teutonia, Santa Catarina, Brazil, 22-III-1952 (Fritz Plaumann) (UK).

FEMALE.—Front on upper half with several interspaces as wide as an ocellus. Antennal flagellum slender, first 3 joints 2.8 times as long as wide. Mandible without preapical denticle.

Dorsal pronotum with complete transverse carina; punctures of third-degree density except in a transverse band across middle of segment. Lateral pronotum flat, its only sculpturing being a large area of microscopic aciculations. Scutum with anteromedian escutcheon and notaulices strongly connected. Mesopleuron on outer disc with small punctures separated by several times their average diameter, and a few minute punctures; subtegular patch of micropunctures narrower than tegula. Hind tibia moderately angular in cross section; sensorium about one-fifth width of joint and not longer than broad. Hind basitarsus without groove. Forewing with membrane infumate; stigma separated by slightly more than its length from basal vein; radius on first section without backwardly directed spur; radial cell terminating in an outwardly directed spur.

Areola of dorsal propodeum exceptionally slender, its length over 4 times, and its base one and one-third apical width. Lateral propodeum with fine but widely separated rugulae; microsetae on lower part relatively sparse. Tergum 1 without anterior transverse carina; preapical band a single row of punctures which are not impressed and are separated by less than their average diameter. Intermediate terga finely punctate; terga 3 and 4 with nearly impunctate areas anterior to preapical concentration. Pygidium punctate on basal

half, punctures terminating in an irregular transverse line; impunctate apex polished, translucent.

Length 8.7 mm.

MALE.—Unknown.

TIPHIINAE of Uncertain Position

In 1910, Brèthes described several species of *Tiphia* from Argentina and Brazil, which I find impossible to identify from the original descriptions. I have tried without success to learn if the types of these species are still in existence. If they are, they should be in the collection of the Museo Argentino de Ciencias Naturales at Buenos Aires. These species are as follows:

T. andina Brèthes, 1910:254. ♀, described from Catamarca, Argentina.

T. bonairensis Brèthes, 1910:255. ♀, described from Buenos Aires, Argentina.

T. fluminensis Brèthes, 1910:256. ♂, described from Rio de Janeiro, Brazil.

T. platensis Brèthes, 1910:255. ♀, Buenos Aires, Argentina.

T. saltensis Brèthes, 1910:254. ♀, described from Salta, Argentina.

T. pallidicornis Turner, 1910:225. Described from a small male 6 mm long with orange antennae. The type is listed as being at the British Museum but I have been unable to find it there. The description is entirely inadequate for identification. Type locality, Anuncion, Paraguay.

In 1913, Brèthes described two new species for which he proposed a new genus and 2 new subgenera. As with the *Tiphia* listed above, I have found the types are inaccessible. Brèthes' proposal of one new genus and 2 new subgenera appears to be based almost entirely on relatively obscure wing characters. No other specimens have been identified of either genus or subgenera since the species were described more than 55 years ago. It appears to me that these do not lie outside the limits of characters of the subgenus *Tiphia* of the genus *Tiphia* as presently recognized.

Tiphia (Tiphia) jorgenseni equals *Tiphiodes (Tiphiodes) jorgenseni* Brèthes, 1913:110.

Tiphia (Tiphia) luridipennis equals *Tiphiodes (Protiphia) luridipennis* Brèthes, 1913:110.

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