Pacific Insects 11 (3-4): 561-570 10 December 1969

A REVIEW OF FELT'S PHILIPPINE GENERA AND SPECIES OF CECIDOMYIIDAE (Diptera)

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Abstract: Five genera described by E. P. Felt and 14 of his 28 Philippine species are reviewed so they may be placed in their proper systematic position and related to the cecidomyiid fauna of the rest of the world. New generic and specific synonymy are established, and new combinations are made, but several species are left unassigned as to genus. Most treated species are redescribed and figured.

The present review of the Felt species of Philippine gall midges (Diptera: Cecidomyiidae) is written in anticipation of a catalog of Philippine Diptera to be prepared by D. E. Hardy and Mercedes Delfinado of the Department of Entomology, University of Hawaii. The purpose here is to place Felt's species in their proper systematic position and to relate them to the cecidomyiid fauna of the rest of the world.

Twelve of the 29 Felt species were originally properly placed in previously named genera, and it is not necessary to treat them here. Two other species, *Diadiplosis smithi* and *Microperrisia pulvinariae*, both predators on Coccoidea, were recently revised by Harris (1968) who transferred them to *Coccodiplosis* de Meijere and *Megommata* Barnes, respectively.

Fifteen species are treated here because they could not be identified with certainty from the descriptions, most of which were made from a single poorly mounted pecimen that sometimes lacked critical parts. I have remounted several of the types to good advantage and, in the notes and description that follow, have used characters which are more meaningful than those used by Felt. Five of these species belong to five monotypic genera named by Felt. These genera are apparently valid; one change only is made: *Luzonomyia* Felt, originally placed in the Oligotrophidi, is here referred to the Asphondyliidi. *Spatholobomyia* Rao, named to replace *Heliodiplosis* Felt, was unjustified and is here placed as an objective junior synonym of *Heliodiplosis*. Of the remaining nine species, one is a new synonym and seven, which were originally malassigned, are either placed in new combinations or are considered unplaced species of tribes or supertribes. One species remains tentatively assigned to genus.

Felt (1919) referred one species each to *Itonida* Meigen and *Cecidomyia* Meigen, even though he was aware that both generic names were synonymous (Felt, 1911). He (1925: 15) later gave his reasons for using these names simultaneously: he used *Itonida* as limited

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by its type-species, *Tipula pini* DeGeer, but used *Cecidomyia* as a collective group name without a type-species for species either known only from galls or not referable to more exactly defined genera. As it was, Felt used even *Itonida* as an *omnibus* category. *Cecidomyia* (*Itonida* now suppressed in favor of *Cecidomyia*) is now restricted to resin midges on conifers, and all the other species Felt placed in *Itonida* and those he placed in *Cecidomyia* must be reassigned elsewhere.

The species considered here are treated in alphabetical order according to their original combination. Table I lists all of Felt's Philippine species in alphabetical order by their original combination and shows their current placement and hosts. All the Felt types are in the Felt Collection which is on loan to the U. S. National Museum from the New York State Museum in Albany.

Cecidomyia philippinensis Felt, 1919: 294. Fig. 1.

This species is based on 1 ♀ specimen in poor condition, and I am referring it to the unplaced species of Cecidomyiidi. When more specimens of this species are reared from leaf galls of its host, *Spatholobus palawanensis* (Elm.) Merr. (Leguminosae), they may be recognized by the following combination of characters:

Postvertical peak present; eyes large; neck of flagellomere III less than 1/5 length of node; palpus 1-segmented (though the possibility exists that 1 or more segments are missing); R_5 not greatly curved, joining C posteriad of apex of wing; Rs and M_{3+4} evident; abdomen: sterna I-VII quadrate, entire, with many setae evenly distributed over sclerite; terga I-VII quadrate, entire; tergum VIII not evident; ovipositor (fig. 1) short, not retractile; dorsal lamellae bilaterally compressed, rounded apically, and bearing many short setae. All tarsomeres II-V are lost. The nonprotrusible ovipositor separates this species from *Heliodiplosis spatholobi* Felt (*q. v.*), which was also reared from leaves of a species of *Spatholobus*.

Contarinia saltata Felt, 1919: 289.

This species, taken from a spider web on *Sorghum bicolor* (L.) Moench (Gramineae), fits in every respect the description of *Contarinia sorghicola* (Cocquillett) in Harris (1964), and I consider the 2 species synonymous. Felt (1919) stated that a series of specimens was taken from the spider web, but he did not state clearly how many were used as the basis for his description. In the Felt Collection, there is only 1 ♂, which I am designating the lectotype. It bears the following data: Los Banos, P. I., 6. II. 1918, L. B. Uichanco, a2884.

Ctenodactylomyia antidesme Felt, 1919: 287. Fig. 2.

Felt (1919) tentatively referred this species, known from a single ♀, to *Ctenodactylomyia* because of a superficial resemblance in the claws. This genus belongs to the supertribe Cecidomyiidi, but *C. antidesme* belongs to the Oligotrophidi. With its long, protrusible ovipositor (about 0.35 length of abdomen), tridentate claws (fig. 2), and 1-segmented palpus, *C. antidesme* resembles *Guarephila* Tavares from Brazil and *Navasiella* Tavares from the Iberian Peninsula. It differs from *Guarephila* mainly in its stronger, more sharply bent claws and from *Navasiella* in its stronger wing venation. The apices of the last tarsomeres of *C. antidesme* each bear 2 lateral rows of short, stout setae, a character not mentioned in the descriptions of *Guarephila* (Tavares 1909) or *Navasiella* (Tavares 1919).

Table I. Felt species of Philippine Cecidomyiidae.

Original combination	Systematic placement in this paper	Hosts*
Arthrocnodax coprae	unchanged	dried copra (presumably a mite predator)
Asphondylia callicarpae	〃	*Callicarpa cana* L. (Verbenaceae), leaf galls
Asphondylia grewiae	〃	*Grewia stylocarpa* Warb. ex Perkins (Tiliaceae), leaf galls
Asphondylia vitea	〃	*Cissus trifolia* (L.) Schiem (Vitaceae), stem galls
Bremia macrofila	〃	unknown
Cecidomyia philippinensis	unplaced Cecidomyiidi	*Spatholobus palawanensis* (Elm.) Merr. (Leguminosae), leaf galls
Contarinia saltata	j. syn. of *C. sorghicola* (Coq.)	*Sorghum bicolor* (L.) Moench (Gramineae), seeds
Ctendactylomyia antidesme	unplaced Oligotrophidi	*Antidesma moritzii* Muell. Arg. ex Stopf. (Euphorbiaceae) leaf, galls
Diadiplosis smithi	under *Coccodiplosis* (Harris, 1968)	Pseudococcidae (Insecta: Hemiptera: Homoptera)
Diceromyia vernoniae	unchanged, redescribed	*Vernonia lancifolia* Merr. (Compositae), leaf galls
Heliodiplosis spatholobi	〃 , 〃	*Spatholobus gyrocarpus* (Wall.) Benth., (Leguminosae), leaf galls
Hyperdiplosis banksi	〃	*Cissus adnata* Roxb. (Vitaceae), leaf galls
Hyperdiplosis relicta	〃	unknown
Itonida paederiae	unplaced Mycodiplosini	*Paederia tomentosa* Blume (Rubiaceae), leaf galls
Kamptodiplosis reducta	unchanged, redescribed	*Siphonodon celastrineus* Griff. (Celastrineae), leaf galls
Kronodiplosis uichancoi	: , 〃	*Barringtonia acutangula* (L.) Gaerth. (Myrtaceae), leaf galls
Lasioptera falcata	unchanged	undet. Cucurbitaceae, stem galls
Lasioptera manilensis	〃	*Leea manillensis* Walp. (Vitaceae), leaf galls
Lasioptera paniculi	〃	*Panicum carinatum* J. & C. Presl. (Gramineae), panicles
Luzonomyia symphoremae	unchanged, redescribed	*Symphorema luzonicum* (Blanco) F. Vill. (Verbenaceae), leaf galls
Microperrisia pulvinariae	under *Megommata* (Harris, 1968)	*Coccidae* (Insecta: Hemiptera: Homoptera)
Mycodiplosis spondiasi	unplaced Cecidomyiidi	*Spondias purpurea* L. (Anacardiaceae), unspecified galls
Profeltiella orientalis	n. comb., under *Parallelodiplosis*	*Siphonodon celastrineus* Griff. (Celastrinieae), leaf galls
Rubsaamenia multinoda	n. comb., under *Camptomyia*	unknown
Scheueria schefflerae	unchanged, redescribed	*Schefflera insularum* (Seem) Harms. (Arliaceae), leaf galls
Schizomyia acalyphae	〃	*Acalypha amentacea* Roxb. (Euphorbiaceae), leaf galls
Schizomyia diplodisci	〃	*Diplodiscus paniculatus* Turcz. (Tiliaceae), stem galls
Toxomyia brideliae	unplaced Cecidomyiidi	*Bridelia stipularis* (L.) Blume (Euphorbiaceae), leaf galls
Tricontarinia luzonensis	n. comb., under *Lestodiplosis*	*Parashorea melaanonan* (Blume), Merr. (Dipterocarpaceae), leaf galls

* All plant names were checked by Crops Research Division, Agr. Res. Serv., USDA.

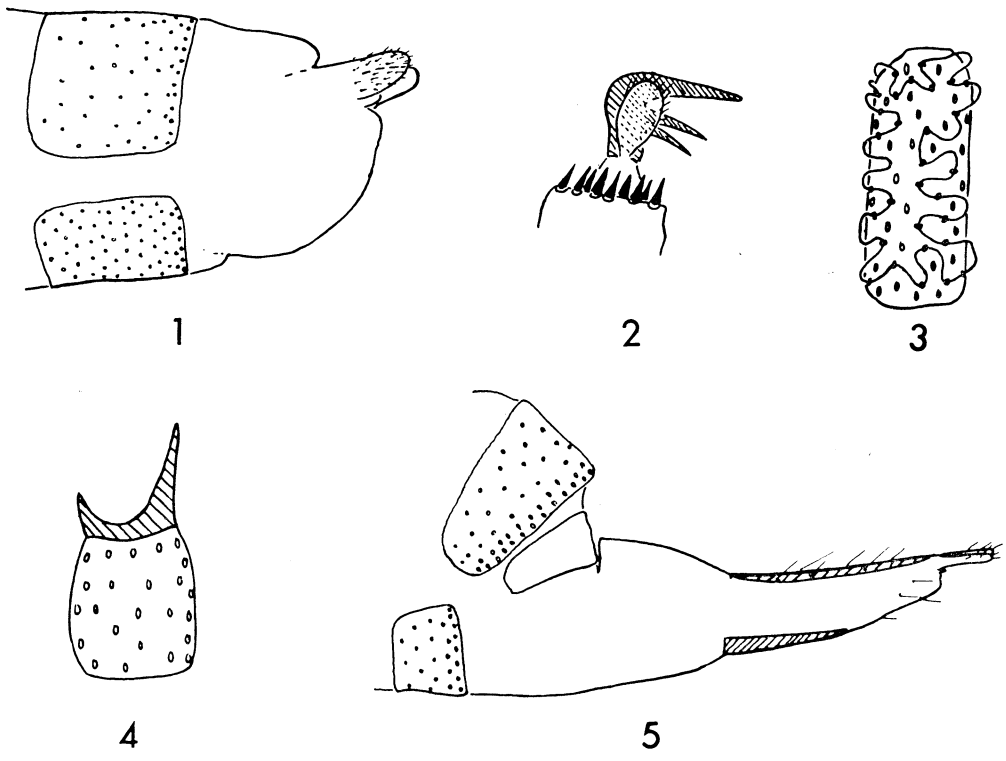

Fig. 1-5. 1, Ovipositor of *C. philippinensis*; 2, one claw, empodium, and apex of tarsomere V of *C. antidesme*; 3, ♂ flagellomere III of *D. vernoniae*; 4, distimere of *D. vernoniae*; 5, Ovipositor of *H. spatholobi*.

When the ♂ of *C. antidesme* is reared, it should be possible to determine whether the species is to be included in either of these genera or in a new genus. Until then, this species is best referred to the unplaced species of Oligotrophidi.

Diceromyia Felt, 1918: 283.

Type-species: *Diceromyia vernoniae* Felt, by original designation.

This genus belongs to the tribe Asphondyliini of the supertribe Asphondyliidi. The unequally bidentate apex of the distimere is its most conspicuous distinguishing character. The ♀ and immature stages are unknown. The following species description will serve also to characterize the genus.

Diceromyia vernoniae Felt, 1918: 284. Fig. 3-4.

Male antennal flagellomere III (fig. 3) with 4 longitudinal, zigzagging circumfila united at the apical and proximal ends; palpus with 2 minute, rounded segments; claws strongly curved, empodium as long as claws; terga I-VII each quadrate, entire, with setae evenly distributed on the sclerites; tergum VIII short, especially mesally, naked; sterna II-VII each quadrate, with a

small circular unsclerotized spot laterally, and sterna III–VII each slightly longer than the preceding; sternum VIII short, covered with setae; genitalia: tergum X with large, deeply emarginate lobes; sternum X shallowly emarginate aedeagus narrow, straight-sided, dorsally curved, with 2 short claspettes near base; basimere stout, with a ventral, apical lobe; distimere (fig. 4) stout, wide, with many setae laterally, apex strongly sclerotized, bidentate, the ventral tooth 2 × as long as the dorsal one.

Heliodiplosis Felt, 1918: 291.

Type-species: *Heliodiplosis spatholobi* Felt, by original designation.

This genus belongs to the supertribe Cecidomyiidi but does not fit into any named tribe. The long, protrusible ovipositor (fig. 5) resembles that found in the Contariniini, but the toothed claws preclude placing it in that tribe.

Rao (1952) proposed a new name *Spatholobomyia* for *Heliodiplosis*, since *Heliodiplosis* was allegedly preoccupied by Haeckel (1887). However, on checking Rao's Haeckel reference, I find that it was *Heliodiscetta* that Haeckel described and not *Heliodiplosis*. *Spatholobomyia*, therefore, is a junior synonym of *Heliodiplosis*.

Rao (1955) mistakenly considered himself the author of *Spatholobomyia spatholobi* as if the specific epithet were also a new name. The specific epithet should have been followed by "Felt" in parentheses. Under the International Rules of Zoological Nomenclature, *S. spatholobi* Rao fills the condition for an available name but is a junior objective synonym of *H. spatholobi* Felt.

The following species description will also characterize the genus.

Heliodiplosis spatholobi Felt, 1918: 291. Fig. 5

Postvertical peak absent; neck of ♀ flagellomere III 1/3 as long as node; palpus short, 3-segmented, segment I bulbous, globular, segment II bulbous, 1.5–2 × as long as wide, wider than segment III; last about 3 × as long as wide; R_5 curved to join C behind apex of wing, Cu_1 and Cu_2 weak, stub of Rs present; tarsomeres I, IV, and V subequal in length; tarsal claws all toothed; empodia almost as long as claws; ♀ abdomen: terga I–VI and sterna II–VI remarkably short, entire, with evenly distributed setae; tergum and sternum VII (fig. 5) longer, subequal to one another in length; tergum VIII short, devoid of setae; ovipositor (fig. 5) long, protrusible, distal 1/2 with sclerotized dorsum and partially sclerotized venter, the sides unsclerotized; dorsal lamellae dorsoventrally flattened, closely juxtaposed mesally.

The species, known from 2 ♀ specimens, was reared from leaf galls on *Spatholobus gyrocarpus* (Wall.) Benth. The long protrusible ovipositor readily separates it from *C. philippinensis* (*q.v.*), also reared from a species of *Spatholobus*.

Itonida paederiae Felt, 1919: 293. Fig. 6–7.

The male genitalia resemble superficially those of *Mycodiplosis* Rübsaamen. Typical *Mycodiplosis* species, however, graze upon rusts, but *I. paederiae* was reared from leaf galls on *Paederia tomentosa* Blume (Rubiaceae). I am referring the species to the unplaced *Mycodiplosini* (Cecidomyiidi) on the basis of the following characters:

Postvertical peak present; Rs, M_{3+4}, and vein below Cu evident; foretarsal claws toothed, the

others simple; empodium slightly shorter than the claws; terga I-VII and sterna II-VII quadrate, entire, sterna II-VI with setae sparse immediately proximad of apical rows; ♂ tergum VII weakly sclerotized apically with few apicolateral setae; ♂ tergum VIII weakly sclerotized, devoid of setae; ♀ tergum VIII with setae only apically; ♂ genitalia as in fig. 7; ovipositor short, upper lamellae 2 × as long as wide (fig. 6).

Kamptodiplosis Felt, 1918 : 290.

Type-species: *Kamptodiplosis reducta* Felt, by original designation.

This genus belongs to the Cecidomyiidi but does not fit into any named tribe. Felt (1918) stated that it resembled the subtropical genus *Kalodiplosis* Felt, but he was right only in the superficial character of the toothed claws. The genitalia of *Kalodiplosis* are quite different. The following species description will also serve to define the genus.

Kamptodiplosis reducta Felt, 1918: 290. Fig. 8.

Postvertical peak absent; ♂ antennal flagellomere III trifilar, the loops subequal in length; neck of ♀ flagellomere III about 1/2 length of node; palpus : ♂ with 3 rounded, short, subequal segments, ♀ with 4 short, cylindrical segments; claws toothed, empodia subequal to claws in length; R_5 broadly curved to join C behind apex of wing; Cu_1 and Cu_2 weak; M_{3+4} and Rs not evident; terga I-VII and sterna II-VI quadrate, the sterna with setae sparse immediately proximad of apical rows of setae; ♂ tergum VII with about 20 apicolateral setae; tergum VIII weakly sclerotized, devoid of setae ; ♂ genitalia as in fig. 8; ♀ tergum VIII weakly sclerotized with setae present apically only; ovipositor not protrusible; upper lamellae rounded, covered with many setae.

Lectotype here designated, ♂, Luzon, Laguna, near Los Baños, reared from leaf galls on *Siphonodon celastrineus* Griff., L. B. Uichanco, a2852, in Felt Collection. Paralectotype, ♀, with same data as lectotype.

Kronodiplosis Felt, 1918: 289.

Type-species: *Kronodiplosis uichancoi* Felt, by original designation.

This genus belongs to the supertribe Cecidomyiidi but does not fit in any named tribe. Despite the bifilar antennal flagellomeres, *Kronodiplosis* does not fit into the Contariniini because of the toothed claws and differences in the ♂ genitalia. The following species description will also serve to describe the genus.

Kronodiplosis uichancoi Felt, 1918: 289. Fig. 9.

Postvertical peak present; ♂ antennal flagellomeres bifilar; palpus with 1 short segment; R_5 curved distally to join C behind apex of wing; veins Rs and M_{3+4} not evident; foretarsal claw (remaining tarsi lost) evenly curved, with a strong tooth; empodium as long as claws; terga I-VII quadrate, entire, VII with an uninterrupted row of apical setae; tergum VIII weakly sclerotized, devoid of setae; sterna II-VII each quadrate, the setae evenly distributed over the sclerite; ♂ genitalia (fig. 9): tergum X bilobed, the lobes rounded, sternum X wide, the apex concave; aedeagus about as long as basimere; distimere widest at base, tapering from base to apex.

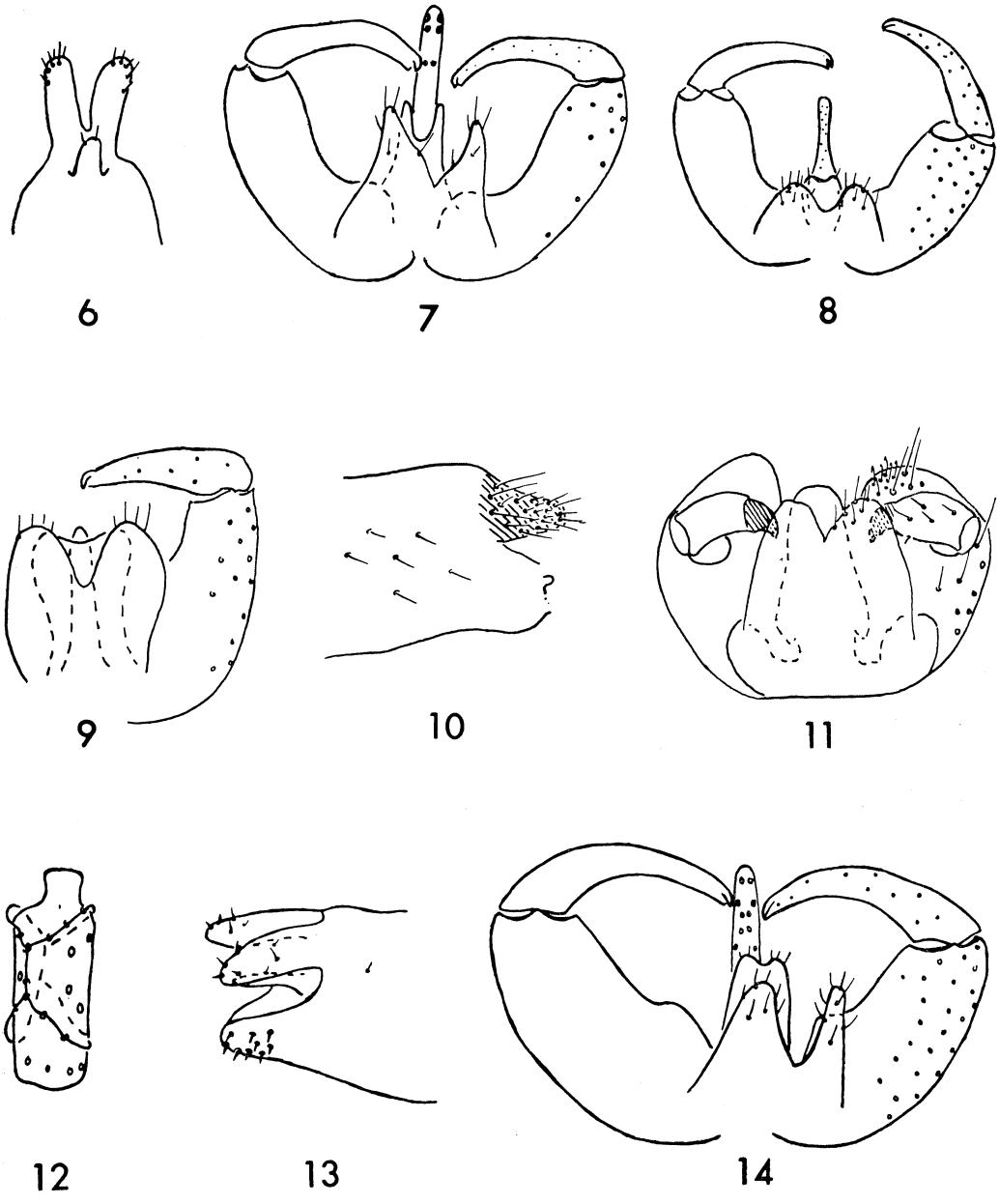

Fig. 6-14. 6, Lamellae of *I. paederiae* (ventral view). 7, ♂ genitalia of *I. paederiae*. 8, ♂ genitalia of *K. reducta*. 9, ♂ genitalia of *K. uichancoi*. 10-12. *L. symphoremae*. 10, dorsal lamellae; 11, ♂ genitalia; 12, ♀ flagellomere III. 13, Ovipositor of *M. spondiasi*. 14, ♂ genitalia of *P. orientalis*.

Luzonomyia Felt, 1918: 282.

Type-species: *Luzonomyia symphoremae* Felt, by original designation.

Felt referred this genus to the Oligotrophidi, but the antennae, the enlarged sternum VII and the ♂ genitalia refer it to the Asphondyliidi. Only the base remains of what was probably a long, aciculate ovipositor. The following species description will serve to characterize this genus.

Luzonomyia symphoremae Felt, 1918: 282. Fig. 10-12.

Male flagellomeres damaged, circumfila closely appressed but pattern obscured, length neck of flagellomere III less than 1/3 but more than 1/4 that of node; ♀ flagellomere III (fig. 12): neck 1/6 length of node, pattern of circumfila as in fig. 12; palpus short, 3-segmented, the 2 distal segments cylindrical, about 2 × as long as wide; tarsal claws simple; empodium as long as claws; ♂ abdomen: terga I-VII and sterna II-VII quadrate; tergum VIII very short, weakly, sclerotized; sternum VIII less than 1/2 as long as VII, with a breadth 4 × its length; genitalia as in fig. 11; sternum X obscured in preparation, basimeral lobe covered distally with many short, recurved setae; ♀ abdomen: terga I-VII and sterna II-VI as in ♂; tergum VIII short, especially mesally; sternum VII large, about 1/4 longer than wide, distal margin strongly sclerotized; sternum VIII short, without setae; dorsal lamellae (fig. 10) somewhat sclerotized with many setae; ovipositor?

Lectotype here designated ♂, Luzon, Laguna Prov., Mt. Maquiling, 24. VIII. 1917, L. B. Uichanco, a2850, in Felt Collection; paralectotype, ♀, with same data as ♂ except date, 27. VIII. 1917.

Mycodiplosis spondiasi Felt, 1920: 234. Fig. 13.

Felt (1920) doubtfully referred the species, known from the ♀ only, to *Mycodiplosis* Rübsaamen, but the dearth of eye facets laterally, the absence of the postvertical peak, and the relatively reduced wing venation all preclude its retention in that genus. Until males and larvae are reared from the host, *Spondias purpurea* L. (Anacardiaceae), *M. spondiasi* is best referred to the unplaced species of Cecidomyiidi. The gall was undescribed, but the species can be recognized by the characters in the following description.

Postvertical peak absent; eye facets almost discontinuous laterally at level of antennal bases, with a bridge 2-3 eye facets wide; normally faceted area of most other Cecidomyiidi sclerotized, naked; neck of ♀ antennal flagellomere III less than 1/5 length node, devoid of setulae; palpus 4-segmented; R_5 straight, joining C behind wing apex; Rs and M_{3+4} not evident; Cu_1, Cu_2, and vein below Cu present; foretarsal claw toothed, others simple; claws strongly curved at 2/5 distance from base, only slightly curved beyond; empodium not quite as long as claws; terga and sterna quadrate, the sterna with a bare area immediately proximad of apical setal rows; ovipositor (fig. 13) short, not protrusible; lamellae long; short, strong setae present ventrodistally.

Profeltiella orientalis Felt, 1918: 292. Fig. 14.

On the basis of the genitalia and other characters described below, I am tentatively transferring this species to *Parallelodiplosis* Rübsaamen in the tribe Clinodiplosini (Cecidomyiidi). *Profeltiella* is closely related to *Thomasiniana* and does not belong to the

Clinodiplosini. The genitalia fit the basic plan of *Parallelodiplosis*, but the tarsi of the only available specimen of *P. orientalis* are lost. Whether the claws were simple or toothed cannot be ascertained until more material is collected.

Postvertical peak present; eyes large; ♂ antennal flagellomeres I and II superficially connate; circumfila of each flagellomere regular, subequal in length; palpus 4-segmented; R_5 curved to meet C behind apex of wing; Rs present; terga I-VII and sterna II-VII quadrate, the sterna with a bare area immediately proximad of apical setae; tergum VII without an apical row of setae, but many setae present laterally; tergum VIII naked; ♂ genitalia as in fig. 14.

Scheueria schefflerae Felt, 1920: 231.

This species, described from a single ♀, was only doubtfully referred to *Scheueria* Kieffer & Herbst. There is nothing in the description of *Scheueria longicornis* Kieffer & Herbst (1909, published as n. g., n. sp.) to preclude placing *S. schefflerae* in that genus. The description of *S. longicornis* was very general, however, and *S. schefflerae* can only tentatively be retained in *Scheueria*. The only apparent difference between *S. schefflerae* and *S. longicornis* is the number of antennal flagellomeres (15 in the former, 18 in the latter), a difference which, by itself, is not of generic importance in the Oligotrophidi. Following is a description of *S. schefflerae*.

♀ flagellomeres cylindrical, 15 in number; palpus with 1 large, bulbous segment longer than labella, the latter covered only with short setulae; R_5 almost straight, joining C slightly anteriad of wing apex; Cu_1 evanescent, Cu_2 darker; proportions of leg: femur, 1.00; tibia, 1.14; tarsomere I, 0.18; II, 0.92; III, 0.30; IV, 0.24; V, 0.20; claws toothed, empodia as long as claws; terga and sterna quadrate; tergum VIII with fewer setae proximally than tergum VII; ovipositor about 1/4 length of abdomen; upper lamellae fused, bearing long setae, especially basally.

Rubsaamenia multinoda Felt, 1915: 48.

This species is referred to *Camptomyia* Kieffer because of the presence of Cu_1 and the presence of many mesal setae on the antennal scape.

Toxomyia brideliae Felt, 1920: 233.

This species does not belong in *Toxomyia* and is here referred to the unplaced species of Cecidomyiidi. The ovipositor of *Toxomyia* is not at all protrusible, and the dorsal lamellae are quite large and bear small setae; that of *T. brideliae* is slightly protrusible, and the dorsal lamellae are small with long setae. Another important difference between the two taxa is that the larva of *Toxomyia* grazes on rust fungi, and *T. brideliae* was reared from leaf galls on *Bridelia stipularis* (L.) Blume (Euphorbiaceae). The following description will characterize the species.

Postvertical peak present; neck of female flagellomere III about 1/3 length of node, devoid of setulae; palpus 4-segmented; R_5 curving distally to join C behind apex of wing; stub of Rs present; proportions of foreleg: femur, 1.00; tibia, 0.95; tarsomere I, 0.13, II, 1.00; III, 0.44; IV, 0.26; V, 0.16; foreclaws toothed, others simple, empodium longer than claws; terga I-VII and sterna II-VII entire, a small naked area present proximad of apical rows of setae on sterna;

ovipositor slightly protrusible, about 1/5 length of abdomen; dorsal lamellae separate but small, with long setae.

Tricontarinia luzonensis Felt, 1918: 293

This species, with the spiniform mesobasal lobe of the ♂ basimere, the long necks of the ♀ flagellomeres, R_5 joining C before the wing apex, and the nonprotrusible ovipositor, is a typical *Lestodiplosis* and is here transferred to that genus. The ♂ genitalia are laterally mounted, and Felt apparently did not recognize the basimeral lobes as such but described them as the "harpes."

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