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CHIRONOMIDAE (DIPTERA) OF FLORIDA
III. THE HARNISCHIA COMPLEX (CHIRONOMINAE)

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CHIRONOMIDAE (DIPTERA) OF FLORIDA

III. THE HARNISCHIA COMPLEX (CHIRONOMINAE)¹

ELISABETH C. BECK AND WILLIAM M. BECK, JR.²

SYNOPSIS: Reared chironomids from Florida, which American authors have classified as belonging to the genera *Cryptochironomus* or *Harnischia*, were studied and placed in four genera described by European authors.

Larva, pupa, and adult of each species are described, and in classifying the 16 Florida species the following taxonomic changes are noted: *Tendipes tenuicaudatus*, *Chironomus directus*, *Chironomus sublettei*, *Harnischia carinata*, *Chironomus hirtalatus*, *Tendipes pectinatellae*, and *Chironomus alatus* are now placed in the genus *Parachironomus*. *Harnischia casuaria* is made a species of the genus *Cryptotendipes*, and *Chironomus undine* is placed in the genus *Paracladopelma*.

Two new species are described: *Parachironomus schneideri* and *Paracladopelma loganae*.

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INTRODUCTION

Although the taxonomy of the Chironomidae has been in a confused state for some time (Beck and Beck, 1966, 1968; Fittkau, 1968), probably the greatest variety of taxa has been proposed for those species that American authors have classified under *Cryptochironomus* or *Harnischia*. These are the Chironomini with the appendages of the male genitalia greatly reduced or absent. The anal point is present; appendage 2 is absent or present as a small lobe, usually without macrotrichia; appendage 1 is lobe-shaped (rounded at the apex), rod-shaped (long, slender, with apex flat or excavated), or apparently lacking.

The taxonomy of these groups has been handled seemingly in three ways 1) Putting all these species in the genus *Chironomus*, subgenus *Cryptochironomus*, and making no further breakdown except species. This follows Freeman (1957), and was the procedure adopted by Sublette and Sublette (1965). 2) Separating the species into the genera *Cryptochironomus* s.s. and *Harnischia* (with two or more subgenera), as was done in Townes (1945). 3) Classifying the species into a number of different genera, as proposed by European workers, principally Lenz.

As our studies with reared specimens show distinctive morphological characters in all three life stages of the groups we have included, and as we feel these different characters of generic importance, we have adopted the European concept and give these groups generic rank in this paper.

We do find, however, that some of the genera we are dealing with have, in the immature stages, many characters in common with *Chironomus* (*Dicrotendipes*), and in other stages appear to be especially close to other chironomid genera. This makes it difficult, if not impossible, to draw straight-line relationships. We are placing the Florida species that we have reared into the following genera: *Cryptochironomus* Kieffer, *Parachironomus* Lenz, *Paracladopelma* Harnisch, *Cryptotendipes* Lenz, and *Harnischia* Kieffer (= *Cryptocladopelma* Lenz). We feel that *Demicryptochironomus* Lenz and *Microchironomus* Kieffer (= *Leptochironomus* Pagast) are also valid genera, but none have been reared from Florida.

The species falling into *Cryptochironomus* will be dealt with in a later paper, but the genus is included in keys to the genera because its similarity to the genera under consideration requires that we be able to differentiate it clearly.

Sublette and Sublette (1965) list 53 species under *Chironomus* (*Cryptochironomus*); of these only 6: *argus* Roback, *blarina* Townes, *digitatus* (Malloch), *fulvus* (Johannsen), *psittacinus* (Meigen) and *scimitarus* Townes are *Cryptochironomus* s.s. The remaining 46 will probably fall into the genera discussed in this paper.

Abbreviations follow those of Dendy and Sublette (1959). Wing length is measured from the basal arculus to wing apex. Antennal ratio of larvae is expressed as the proportions of the segments. Holotypes of new species are deposited in the United States National Museum. Paratypes, where available, are deposited with the Florida State Collection of Arthropods, Gainesville, Florida, and in the authors' collection.

Key to Genera — Adult Males^a

1. Appendage 1 of male genitalia long, slender, rod-like, at least three times as long as wide 2
Appendage 1 of male genitalia rounded, lobe-like, or scarcely discernible 4
2. A small bristle bearing hump on each side of anal point; anal point not "set down," broad at base and widened toward apex *Microchironomus*
Not as above, anal point tapered, not usually widened apically 3
3. Dististyle with distinct notch on inner margin, appendage 1 rounded at apex, usually with 3 apical bristles *Cryptotendipes*
Dististyle not distinctly notched on inner margin; appendage 1 flat or excavated at apex, usually only 2 apical bristles *Parachironomus*
4. Appendage 2 is a distinct lobe; tergite IX not broad on each side of anal point 5
Appendage 2 scarcely discernible; tergite IX broad laterally from anal point and may be drawn into points at lateral corner *Harnischia*
5. Appendage 1 rather large, broader at apex, the lobe covered in microtrichia and with several bristles; appendage 2 without bristles *Paracladopelma*
Appendage 1 a small lobe, not broadened at apex 6
6. Anal point broadly triangular at base, appendages 1 and 2 very small, may have a common base, or overlies each other *Demicryptochironomus*
Anal point slender, or broadened toward apex, not triangular basally *Cryptochironomus*

Key to Genera — Larvae

1. Labial plate with a broad pale median area and oblique darker lateral teeth, so that labial plate appears concave 2
Labial plate not as above, generally convex 3
2. Larval antenna 5-segmented *Cryptochironomus*
Larval antenna 7-segmented *Demicryptochironomus*

^aTable 1, following these keys, summarizes the characteristics of each genus.

3. Basal segment of maxillary palpus less than one-half as long as antennal segment 1; paralabial striae usually fading toward anterior (exception is *P. pectinatellae*); premandibles with 2 (rarely 3 or 4) blades 4
 Basal segment of maxillary palpus more than one-half as long as antennal segment 1; paralabial striae distinct to anterior margin; premandibles with 4-5 blades *Paracladopelma*
4. Labial plate with single unnotched median teeth (exception is *pectinatellae*), see Plate II, fig. 6a 5
 Labial plate with median tooth double or notched 6
5. Median labial tooth more or less pointed, with 6 or 7 lateral teeth usually progressively reduced in size; anterior margin of paralabials crenulate; head capsule not darkened. *Parachironomus*
 Median labial tooth broadly rounded; outer labial teeth much enlarged; anterior margin of paralabials not distinctly crenulate; gular area of head capsule darkened *Cryptotendipes*
6. Median labial tooth usually notched medially or double *Harnischia*
 Median labial tooth trilobed *Microchironomus*

Key to Genera — Pupae

1. Anal segment with a pair of posterior conical projections; cephalic tubercles conspicuous, often forked or with a distinctive shape; tergites II or III - VII with posterior row of heavy spines *Cryptochironomus*
 No paired projections posteriorly on anal segment 2
2. Abdominal tergites III - VI (or VII or VIII) with posterior rows of fairly broad sharp spines. Similar apical rows on sternites III - VI to VIII. Respiratory organ arising as a long stalk, branched some distance from body, often half the length of the pupal body or longer *Cryptotendipes*
 Not as above 3
3. Segment VIII with 4 lateral filaments and usually a long lateral spine 4
 Segment VIII with 5 lateral filaments (5th may be smaller and set in from margin), and only very tiny spines or none at postero-lateral corner 5
4. Shagreen on tergites III - VI confined to posterior third of each segment; spines on VI form mace-like patch *Harnischia*
 Shagreen on tergites III - VI not confined to posterior third of each segment; in paired patches or bands; no mace-like patch on VI. *Microchironomus*
5. Posterior row of hooks on tergite II more than one-half as wide as segment; respiratory organ with a few spines on outer branches; cephalic tubercles short, broad basally and bent at tip; tergites II - VI with median shagreen, or almost to posterior margin, heaviest apically; 1-10 small lateral spines on VIII *Demicryptochironomus*
 Posterior row of hooks on tergite II less than one-half as wide as segment; respiratory organ without spines 6
6. Shagreen on tergites III - VI in median longitudinal band of fine spicules (which may have a clear median line apically) with coarser spines toward posterior margin *Parachironomus*
 Shagreen on tergites III and IV in paired patches, becoming contiguous on V and VI; posterior short coarse spines are in rows; shagreen usually confined to posterior half of tergite *Paracladopelma*

TABLE I

GENERIC CHARACTERS BASED ON FLORIDA SPECIMENS

| | Adult | | Larva | | | | Pupa | | | |
|-------------------------|--|---|------------------|---|-----------------------------|---------------------|------------------------|----------------------|--|---------------------------------|
| | Appendage 1 of male genitalia | Labial plate | No. anten. segs. | Para-labial striae | Lateral mand. teeth | No. Premand. blades | Lateral lobes on I, II | Hook row II divided? | Tergites III-VI, spination | Lateral filaments V-VIII |
| <i>Cryptochironomus</i> | small lobe many bristles microtrichia | medium domed area with oblique row lateral teeth | 5 | not recurved (plate may be) | 2 or 3 | 4 or 5 | present on II or not | yes | posterior row blunt spines on I or III-VII or VIII | usually 4-4-4-5 |
| <i>Parachironomus</i> | rod with 2 apical bristles | 13-15 teeth progressively smaller from median | 5 | sometimes recurved; anterior margin usually crenulate | 2-3 | 2 or 3 | yes I and/or II | no | median longitudinal band of fine spiculation, heavier spines near posterior margin on III-VI | 4-4-4-5 |
| <i>Cryptotendipes</i> | small rod 3-4 apical bristles | median domed dark tooth, 7 laterals, outer 3 projecting | 5 | distinct, fading apically | 3 small flat, square tipped | 2 | no | usually | rows coarse spines III-V, contiguous VI, usually paired III-V | 4-4-4-4 usually with long spine |
| <i>Harnischia</i> | small lobe, 2-3 bristles, or apparently lacking | median tooth usually notched, middle 3 may be paler, outer 3 much enlarged, projecting | 5 | distinct, short, 2 fading apically | 2 dark squared | 2 | no | yes | paired patched III-IV, contiguous V; spines fine, heavier toward posterior mace-like patch on VI | 4-4-4-4 plus long spine |
| <i>Paracladopelma</i> | lobe, enlarged apically, many microtrichia, 3 or more bristles | median broad, pale area, may be notched into small square teeth; 5 laterals, outer may project slightly | 5 | distinct to anter. margin | 3 square and/or pointed | 4 or 5 | no | no | fairly coarse spines in posterior rows; those on VI may suggest mace, or not | 4-4-4-5 |

Genus *Cryptochironomus* Kieffer

Cryptochironomus Kieffer, 1918: 38. Genotype: (*Tendipes* (*Cryptochironomus*) *chlorolobus* Kieffer) = *supplicans* (Meigen) (original designation), [fide Townes, 1945: 96]; Harnisch, 1923: 285-288 [partim] Lenz, 1921: 15; Lenz, 1941: 34; Townes, 1945: 96; Lenz, 1960c: 224.

Chironomus (*Chryptochironomus*) Kieffer. Goetghebuer, 1928: 73 [partim]; Goetghebuer, 1937 (in Lindner): 36-41 [partim]; Freeman, 1957: 382-405 [partim].

Chironomus (*Chironomus*) group *Cryptochironomus* Kieffer. Edwards, 1929: 388; Pagast, 1931: 209, 213-216; Johannsen, 1937: 20.

ADULT: Very generally, adults of this genus are larger and heavier bodied than adults of the other genera under consideration here. The dististyle of the male genitalia is more or less angular at apex and fairly short, the appendages are small, rounded, about equal in size, both densely pubescent and with several bristles. The presence of bristles on appendage 2 separates this genus from all other genera considered here.

LARVA: Labial plate with wide median pale domed area and five dark lateral teeth on each side, the outer tooth may be notched, general shape of plate concave so that outermost teeth project anteriorly; basal segment of maxillary palp is three to four times as long as wide; premandibles with four to six blades; antennae five-segmented, blade arising near apex of second segment.

PUPA: Cephalic tubercles are often very large and of distinct shapes. Posterior hook row on tergite II usually interrupted medially; tergites III - VIII with heavy spines near posterior margin; no comb or caudolateral spines on VIII. Lateral filaments on V - VIII: 4-4-4-5 usually, but may differ in some species. Anal fins have paired tubular median projections.

Genus *Demicryptochironomus* Lenz

Demicryptochironomus Lenz, 1941: 34. Genotype: *Demicryptochironomus vulneratus* Zett. [monotypic]; Lenz, 1960a: 450-463; Lenz, 1960c: 222.

ADULT: Very difficult to separate from other genera. Appendages of male genitalia are very short and appear to overlay one another, or to have a common base; base of anal point is broadly triangular.

LARVA: Labial plate much as in *Cryptochironomus*, but with seven lateral teeth; premandibles with four blades, one of which is much smaller; antenna seven-segmented.

PUPA: Exuvia pigmented, yellow; posterior hook row on tergite II not interrupted medially and more than one-half as wide as segment; VIII

with 2-10 small spines caudo-laterally, these fused at base. Lateral filaments on segments V - VIII: 4-4-4-5.

Genus *Parachironomus* Lenz

Parachironomus Lenz, 1921: 13. Genotype: *Chironomus cryptotomus* Kieffer [by present designation]; Harnisch, 1923: 304 [Harnisch's designation of genotype: *pararostratus* n. sp. is invalid because that species was not listed by Lenz in 1921]; Lenz, 1941: 34; Lenz, 1957 (in Lindner): 196; Fittkau, Reiss, and Schlee, 1967: 373.

Chironomus Meigen. Malloch, 1915: 452, 474-475 [partim].

Chironomus (*Chironomus*) group *Parachironomus* Lenz. Edwards, 1929: 388; Pagast, 1931: 210.

Chironomus (*Cryptochironomus*) group III *Parachironomus* Lenz. Johannsen, 1937: 21; Goetghebuer, 1937: 41 [Goetghebuer's designation of "? *P. cryptotomus*" as genotype is invalid because questioned.]

Dychironomus Lenz 1941: 35 [nomen nudum — published after 1930 and type fixation by Townes, 1945, occurs in synonymy].

Paracharnischia Lenz 1941: 36. [nomen nudum — published after 1930 and type fixation by Townes, 1945, occurs in synonymy].

Harnischia (*Harnischia*) Kieffer. Townes, 1945: 152 [partim]

[Townes' designation of *Chironomus cryptotomus* Kieffer as genotype of *Parachironomus* is invalid because it occurs in synonymy]; Roback, 1957: 101.

Tendipes (*Cryptochironomus*). Dendy and Sublette, 1959: 515-517 [partim]; Sublette, 1960: 220-224 [partim]; Darby, 1962: 1-200 [partim].

Chironomus (*Cryptochironomus*). Freeman, 1957: 382-405 [partim]; Sublette, 1964a: 133 [partim]; Beck, 1962: 91 [partim]; Beck and Beck, 1964: 203 and 205.

ADULT: Appendage 1 elongate, usually with two apical bristles; appendage 2 is a very small lobe or is lacking. Frontal tubercles usually lacking, but some species have very small ones present.

LARVA: Labial teeth more or less pointed, evenly and progressively reduced from median to outermost, equally pigmented; paralabial striae distinct, sometimes recurved, but not reaching the anterior margin of paralabial plate (except in *pectinatellae*), the anterior margin crenulate. Antennae five-segmented, two ring organs on basal segment, the blade arising from apex of basal segment. Mandible with two or three lateral teeth which are usually pointed; premandibles with two, or sometimes three blades. Claws of posterior prolegs with fine hairlike spines along inner margin; in some species anterior claws are pectinate near apex.

PUPA: Exuvia clear, colorless or pale brownish. Cephalic tubercles rather short with apical spine. Posterior lateral lobes usually present on segment II. Posterior row of hooks on tergite II not interrupted medially. Shagreen on tergites III - VI in median longitudinal band

(which may have a clear line apically) with coarser spines toward posterior margin. Tiny caudo-lateral spines may be present on segment VIII. In some species there are rows of long pale spines on sternites I and/or II.

Eight species of *Parachironomus* have been reared from Florida: *alatus*, *hirtalatus*, *pectinatellae*, *sublettei*, *monochromus*, *directus*, *carinatus*, and *schneideri* n. sp. The following species that probably belong in *Parachironomus* have been recorded from Florida, but not reared: *frequens* (Johannsen), *potamogeti* (Townes), *tenuicaudatus* (Malloch), and *nigrovittatus* Malloch.

Key to Species of *Parachironomus* — Larvae

1. Median labial tooth double or deeply cleft *pectinatellae*
 Median labial tooth not double or deeply cleft 2
2. Penultimate labial tooth on each side distinctly longer than teeth on each side of it 3
 Penultimate labial tooth not longer 4
3. Fourth antennal segment longer than 3rd and 5th together (paralabial striae not recurved; anterior margin paralabial plate scalloped with points posterior; premandible light) *alatus*
 Fourth antennal segment shorter than 3rd and 5th together; (paralabial striae recurved; anterior margin paralabial plate scalloped with points anterior; premandible dark) *hirtalatus*
4. Three large dark lateral teeth on mandible; 3rd antennal segment distinctly longer than 4th; (6 lateral labial teeth, with serrate edge to labial plate; anterior margin with scallop points posterior) *sublettei*
 Two dark lateral teeth on mandible, or if 3rd present it is much smaller and somewhat paler; antennal segments 3 and 4 equal, or 4 longer 5
5. Three basal antennal segments brown; premandible dark; (only 2 dark lateral teeth on mandible; paralabial striae recurved; anterior margin paralabials scalloped with points anterior) *schneideri*
 Three basal antennal segments not brown, though segment 2 may be; premandibles not dark 6
6. Lateral edge of labial plate serrate; paralabial striae not recurved 7
 Lateral edge of labial plate not serrate; paralabial striae recurved; 4th antennal segment longer than 3rd *monochromus*
7. Antennal segments 3 and 4 equal in length; paralabial plate scalloped with points posterior *directus*
 Antennal segment 3 shorter than 4; paralabial plate scalloped with points anterior *carinatus*

Key to *Parachironomus* — Adults⁴

⁴This key includes only those species of *Parachironomus* we have reared. Because any species not included will key out somewhere, identifications made by key should be checked against the species descriptions.

1. Wing with macrotrichia in apex of cell R, M, and Cu₁ *hirtalatus*
Wing with no macrotrichia on wing membrane 2
2. Squama without a fringe of hairs, or with only 2 or 3 hairs 3
Squama with 4-15 hairs 6
3. Mid and hind tibiae each with 2 approximately equal spines 4
Mid tibiae with two spines of unequal length 5
4. Dististyle rather short and broad, with base of inner margin rounded out *sublettei*
Dististyle long, slender, straight on inner margin *directus*
5. P.A. bristles 4, 1 spine on middle tibia about 2× as long as the other; appendage 1 of male genitalia rod-like, slightly enlarged apically with 2 bristles, but no microtrichia *carinatus*
P.A. bristles 2, 1 spine of middle tibia about 1½× as long as other; appendage 1 rather short, much broadened apically, covered in dense microtrichia *alatus*
6. Dististyle narrowed toward base, wider toward apex, style distinctly incurved from middle to apex 7
Dististyle of uniform width, more or less straight 8
7. Appendage 1 reaching to apex of anal point; P.A. bristles 7; squamal fringe of 14-15 hairs *tenuicaudatus*
Appendage 1 not reaching to apex of anal point, P.A. bristles 5 or 6; squamal fringe of 6-12 hairs *monochromus*
8. W.L. 1.9 mm or more; apex of dististyle distinctly intumed, apex of appendage 1 also pointed and bent inward at apex *pectinatellae*
W.L. not over 1.7 mm; dististyle and appendage 1 not distinctly intumed *schneideri*

Parachironomus monochromus (Wulp)

Chironomus unicolor van der Wulp, 1858: 5 [fide Townes, 1945: 160].

Chironomus monochromus Wulp, 1874: 129 [fide Townes, 1945: 160].

Harnischia (*Harnischia*) *monochromus* (Wulp). Townes, 1945: 160; Sublette, 1957: 391; Beck and Beck, 1959: 95.

Tendipes (*Cryptochironomus*) *monochromus* (Malloch). Dendy and Sublette, 1959: 516; Darby, 1962: 38.

Chironomus (*Cryptochironomus*) *monochromus* Wulp. Sublette, 1964a: 134.

Parachironomus monochromus (Wulp). Albu, 1966: 147; Albu and Botnariuc, 1966: 51.

MALE: W.L. 1.6 - 1.9 mm; A.R. 2.2 - 2.4; L.R. 1.5 - 1.8. Head pale yellow, antennal flagellum brown; no frontal tubercles. Thorax yellowish green; vittae and postnotum light brown. P.A. bristles 5 or 6, squama with 6-12 hairs. Legs pale yellowish green, forelegs from basitarsus, and all apical tarsal segments brown. Wing membrane pale with light brown veins, small macrotrichia present along the base of R, or R₁ and R₄₊₅. Abdomen green; male genitalia as in Plate I, figure 1, dististyles blackish apically.

FEMALE: W.L. 1.4-1.9 mm. Apical antennal segment dark, about the length of the preceding two segments. Spermathecae two, spherical

with neck at duct lightly chitinized and brownish. Setae are present on wing veins R, R₁ and R₄+₅, and on apical half of M.

LARVA: (Plate II, figures 1 a-d.) Head capsule pale, antennal ratio 50:11:5:6:3. Labial plate with 15 golden yellow teeth; paralabial striae recurved; mandible with two dark lateral teeth; premandible pale with two broad blades. Preanal papillae with eight yellow or pale brown bristles each. Anterior proleg claws yellow, with comb-like teeth at apex; posterior proleg claws yellow with a few very small spines near base of inner margin, very difficult to see.

PUPA: (Plate II, figure 1 f; Plate V, figure 1.) Pale yellow, 3.4-4.6 mm long. Tergite II has a posterior row of 20-30 yellow hooks with a short row of very small colorless spines anterior to hooks, lateral lobes present. Tergites III-VI with paired triangular patches of pale fine spines, patches almost contiguous on VI. Lateral filaments on V-VIII: 4-4-4-5, no caudo-lateral spines on VIII. There are 70-95 lateral filaments on anal fins.

Sublette (1957) described the larva of *Harnischia* (*Harnischia*) *monochromus* and of a *Harnischia* (*H.*) species. The two descriptions were transposed so that the description of the "species" is really of *monochromus*.

REARED SPECIMENS: Jefferson Co., Lake Miccosuckee, May 1964, November 1963.

Seminole Co., Howell Creek, November 1966.

St. Johns Co., Shand's Bridge, June 1963.

This species has been taken in light traps every month of the year throughout the State as far south as Broward County.

Parachironomus tenuicaudatus (Malloch)

Chironomus modestus var. b. Johannsen, 1905: 228.

Chironomus tenuicaudatus Malloch, 1915: 475; Miller, 1941: 62 [*vide* Townes, 1945: 160].

Cryptochironomus bacilliger Kieffer, 1922: 358 [*vide* Townes, 1945: 160].

Chironomus (*Chironomus*) *tenuicaudatus* (*Parachironomus* group). Johannsen, 1938: 21.

Chironomus (*Limnochironomus*) *tenuicaudatus* Johannsen, 1938: 43; Beyer 1941: 3 [*vide* Townes, 1945: 160].

Harnischia (*Harnischia*) *tenuicaudatus* (Malloch). Townes, 1945: 160; Roback, 1957: 103.

Tendipes (*Cryptochironomus*) *tenuicaudatus* (Malloch). Dendy and Sublette, 1959: 516; Sublette, 1960: 224; Darby, 1962: 38.

Parachironomus bacilliger (Kieffer). Fittkau, Reiss, and Schlee, 1967: 373.

MALE: W.L. 2.0 mm; A.R. 2.6; L.R.? (fore tarsi missing). Head pale

green, pedicel and antennal flagellum black, palpi blackish; eyes separated dorsally by about one-half the diameter of the pedicel; no frontal tubercles. Mesonotum green with black vittae, sternum, and postnotum; P.A. bristles 7. Legs gray, foreleg and apical three or four tarsal segments on mid and hind legs blackish; a pair of spines on each mid and hind tibia. Wing membrane pale grayish with gray veins; macrotrichia along veins R, R₁, and R₄₊₅. Squama with 14-15 hairs. Abdomen brown to olive green; genitalia blackish, as in Plate I, figure 2.

FEMALE: None reared.

LARVA: Larval cast lost. Johannsen (1937: 43), describes the larva as having a labial plate of 13 teeth, the median one trilobed; antennal ratio approximately 50:12:6:6:2.

PUPA: (Plate III, figure 2f; Plate V, figure 6). Pale, almost colorless, 4.85 mm long; notum densely nodulate. Cephalic tubercles acutely pointed with subapical bristle. Tergite II with posterior row of about 30 yellow-gray hooks; lateral lobes near posterior margin, shagreened along lateral edge; sternite II shagreened and with narrow band of small spines posteriorly. Tergites III-VI with broad median area of shagreen from basal one-fifth to posterior margin medially, spines slightly larger on each successive segment, a small clear oval area near the posterior border. Tergite VII with median longitudinal band of very fine shagreen; VIII faintly shagreened. Lateral filaments on V-VIII: 4-4-4-5. Each lobe of anal fins bears 90-100 lateral filaments. (Johannsen says only 4 lateral filaments on VIII, and 80-90 filaments on anal fins.)

REARED SPECIMENS: 1 male (no larval cast), Polk County, Lake St. Claire, 21 January 1966.

The only other specimen recorded from Florida was taken at International Airport, Miami, Florida.

Parachironomus schneideri new species

Chironomus (*Cryptochironomus*) *directus* Dendy and Sublette. Beck and Beck, 1964: 205 [partim; misidentification].

HOLOTYPE MALE: Jefferson Co., Fla., Lake Miccosuckee, 4 June 1963 (USNM) W.L. 1.65 mm.; A.R. 2.2; L.R. 1.7.

Head whitish with pedicel and antennal flagellum brownish; no frontal tubercles. Thorax whitish with pale to medium brown vittae, sternum and postnotum. P.A. bristles 5; squama with 12 hairs. Legs pale with apical segments brown, forelegs light brown beyond femora.

Wing membrane and veins pale brown; abdomen pale with male genitalia slightly darker. Genitalia as in Plate I, figure 3.

Beck and Beck (1964) described the immatures of this species as *Chironomus* (*Cryptochironomus*) *directus* immatures. In working with additional reared material, we find that the specimens we were formerly calling *directus* included both *directus* and a new species. They differ as adults in details of the male genitalia, the dististyle of *schneideri* being shorter and wider proportionally, and appendage 1 appears slightly capitate with the two setae on opposite sides, equidistant from the apex, much as in the European species *parilis*. *P. schneideri* is also larger than our specimens of *directus*:

| MALES: | Wing length | Antennal ratio | Leg Ratio |
|-----------------------------------|-------------|----------------|-----------|
| <i>directus</i> holotype | 1.4 mm | 2.3 | 1.67 |
| <i>directus</i> (range described) | 1.3-1.9 | 2.0-2.3 | 1.5-1.7 |
| <i>directus</i> from Florida | 1.0-1.3 | 1.8-2.2 | 1.6-1.8 |
| <i>schneideri</i> new species | 1.3-1.65 | 2.1-2.5 | 1.7-1.8 |
| <i>abortivus</i> Malloch | 3.0 | 3.1 | 1.4 |

FEMALE: W.L. 1.30 - 1.46 mm (2); coloration as in male.

LARVA: (Plate II, figures 2 a-e.) Head capsule pale; antennal ratio 50:9:4:6:3. Basal antennal segment brown, second and third usually brown also. Preanal papillae with eight gray-brown bristles. Claws of posterior proleg with a few spines on inner margin, and in some specimens, along outer margin also. Premandible dark.

PUPA: (Plate II, figure 2f; Plate V, figure 2). Medium to dark brown, 3.6-3.85 mm. long; mesonotum nodulate dorsally; cephalic tubercles broad and fairly short. Tergite II with 24-26 dark hooks in posterior row. Lateral lobes on II; no pale sternal spines. Tergites III-VI with median area shagreened, the spines fairly short and wide, almost triangular; VII with very fine shagreen. Lateral filaments on V-VIII: 4-4-4-5; no caudo-lateral spines on VIII; anal fin with 70 lateral filaments.

REARED PARATYPES: Jefferson Co., Lake Miccosuckee, April 1963 (1 female), November 1963 (1 female allotype, 1 male). We take pleasure in naming this species in honor of Robert F. Schneider.

Parachironomus directus (Dendy and Sublette) new combination⁵

Tendipes (*Cryptochironomus*) *directus* Dendy and Sublette, 1959: 514.

Chironomus (*Cryptochironomus*) *directus* (Dendy and Sublette), Sublette, 1964a: 133; Beck and Beck, 1964: 203.

MALE: W.L. 1.05-1.36 mm (6); A.R. 1.8-2.2; L.R. 1.6-1.8. Head pale whitish, pedicel of antenna brownish, antennal flagellum brown beyond basal segment. Mesonotum whitish with pale ochraceous-brown vittae and postnotum; P.A. bristles 3-4, squama with 2-3 hairs. Legs stramineous, apices brown, forelegs brown beyond middle of femora. Wing membrane very pale, veins brownish; abdomen pale yellow-brown. Genitalia as in Plate I, figure 4.

FEMALE: W.L. 0.90-0.95 mm (3); coloration as in males.

LARVA: (Plate II, figures 3 a-e.) Head capsule pale; antennal ratio 50:12:8:7:4. Labial plate with 15 golden brown teeth, paralabial striae not recurved; mandible with two dark lateral teeth and the suggestion of a smaller dark tooth on shoulder. Preanal papillae with eight yellow-gray bristles; some claws of posterior proleg spined on inner margin.

PUPA: (Plate II, figure 3f; Plate V, figure 3.) Light brown, 2.6-3.2 mm long. Tergite II with 30-32 brown hooks in posterior row. Lateral lobes present; no pale sternal spines. Tergites III-VI with median wide longitudinal band of very fine slender spines; VII faintly spiculate. Lateral filaments on V-VIII 4-4-4-5; no caudo-lateral spines on VIII. Anal fin bears 36-40 lateral filaments.

REARED SPECIMENS: St. Johns Co., Shand's Bridge, June 1963, July 1965, April 1966.

Seminole Co., Howell Creek, October 1966.

Parachironomus sublettei (Beck) new combination

Chironomus (*Cryptochironomus*) *sublettei* Beck, 1961: 127.

MALE: W.L. 1.15-1.35 (3); A.R. 1.5; L.R. 1.6. Head pale with dark brown pedicel of antenna, antennal flagellum brown; very small frontal tubercles present. Mesonotum pale tan with dark brown vittae; P.A. bristles 3. Legs pale brown with forelegs and apices of other legs darker brown. Wing membrane light brown with veins darker brown;

⁵Beck and Beck (1964) described a larva and pupa as *Chironomus* (*Cryptochironomus*) *directus* Dendy and Sublette. It now appears that we were working with a mixed series of *directus* and *schneideri* new species. (See notes under *P. schneideri*.)

abdomen light brown, darker at incisures. Genitalia as in Plate I figure 5. Squama with one hair.

FEMALE: W.L. 1.10-1.50 (5); coloration as in male; last antennal segment dark brown.

LARVA: (Plate II, figures 4 a-e.) Head capsule pale, antennal ratio 50:12:8:8:3; striae of paralabials not recurved; labial plate with 13 teeth and serrate lateral margins; premandibles with two blades. Claws of posterior proleg light brown, spined along inner margin. Mandible with three dark lateral teeth.

PUPA: (Plate II, figure 4f; Plate V, figure 4.) Light yellow-brown, 2.9-3.9 mm long. Tergite II with 28-30 gold-colored hooks in posterior row (as many as 40 in females). Lateral lobes present; no pale sternal spines. Tergites III-VI with broad median longitudinal patch of very slender pale spines; tergite VII with very faint shagreen. No caudo-lateral spines on VIII. Lateral filaments on V-VIII: 4-4-4-5. Anal fins with 32 lateral filaments (males) or 40-55 (females).

REARED SPECIMENS: Escambia Co., Escambia River, November 20, 1963 (1 male, 2 females); Broward Co., Plantation Canal, 24 September 1964 (1 male, 1 female).

Parachironomus carinatus (Townes) new combination

Harnischia (*Harnischia*) *carinata* Townes, 1945: 158; Sublette, 1957: 393; Beck and Beck, 1959: 95.

MALE: W.L. 1.25-1.35 (2); A.R. 1.9-2.2; L.R. 1.9. Head yellow, pedicel orange, palpi whitish, antennal flagellum brown; small frontal tubercles present. Mesonotum yellow, vittae not distinct on our specimens; P.A. 4, scutellum with six long and four shorter bristles. Legs yellowish green, foreleg beyond femora and all apical tarsal segments brownish; tibiae of middle legs each have two apical spines, one nearly twice as long as the other, sole spines on tarsi of middle and hind legs. Wings with membrane and veins light brown, dark setae along R, R₁, and R₄+5. Abdomen pale green, slightly darker apically. Genitalia as in Plate I, figure 6. Squama bare.

FEMALE: W.L. 1.35 mm (1); L.R. 2.0; coloration as in male.

LARVA: (Plate II, figures 5 a-e.) Head capsule very pale; antennal ratio 50:15:5:8:3. Labial plate with 13 golden brown teeth, the lateral margin of plate serrate; all teeth long, pointed, separated. Paralabial striae short, not recurved. Mandible with two dark lateral teeth and small pale basal tooth. Preanal papillae with yellow bristles; claws of posterior proleg grayish-yellow, some with spines near base of inner margin.

PUPA: (Plate II, figure 5; Plate V, figure 5.) Pale brown, 2.85-3.65 mm long. Tergite II with posterior row of about 40 dark hooks. No lateral lobes or pale sternal spines. Tergites III-VI with broad median apical area of fine slender pale spines, about six longer spines near posterior margin of VI. Tergite VIII has two to five very tiny pale spines near caudo-lateral corner. Lateral filaments on V-VIII: 4-4-4-5; anal fin bears 38-46 lateral filaments.

REARED SPECIMENS: Hamilton Co., Swift Creek, August 1966. Flagler Co., Rayonier Ditch, November 1964.

This species has been taken in light traps all months of the year and throughout the State.

Parachironomus hirtalatus (Beck and Beck) new combination
Chironomus (*Cryptochironomus*) *hirtalatus* Beck and Beck, 1964: 204.

MALE: W.L. 1.1-1.55 (9); A.R. 1.8-2.0; L.R. 1.8-2.0. Head yellow, pedicel dark yellow to ochraceous, palpi light brown, antennal flagellum dark brown; no frontal tubercles. Mesonotum yellow with vitæ, sternum and postnotum indistinctly darker; P.A. bristles 4, squama with 4-10 hairs. Legs pale yellow with all apical tarsal segments and the forelegs from middle of femora darker. Wing membrane and veins light brown; macrotrichia present in apex of cells R, M, and Cu₁, and extending back along middle of cell R and along vein M. Abdomen pale yellowish white. Genitalia as in Plate I, figure 7.

FEMALE: W.L. 1.0-1.2 (5); coloration as in male.

LARVA: (Plate III, figure 3 a-e.) Head capsule pale tan; antennal ratio 50:11:4:6:2. Labial teeth 15, very dark, with the sixth lateral longer than fifth or seventh. Premandibles darkened, with two blades; mandible with two large dark lateral teeth and smaller basal tooth sometimes darkened. Preanal papillae with eight bristles; claws of posterior proleg dark gray, some with one or two spines near base of inner margin.

PUPA: (Plate III, figure 3; Plate V, figure 7.) Very pale brown, 3.0-4.1 mm long. Mesonotum with a very distinctive horn-shaped lobe posterior to base of respiratory organ, this lobe usually brownish. Posterior lateral lobes present on segment II. Tergite II with 20-22 dark hooks in posterior row. Sternite I with short pale spines near base on each side. Tergites III-VI with median shagreened area near posterior margin, very small on III and about three-fourths the length of segment on VI; apical row of spines on VI are larger. No caudo-lateral spines present on VIII; lateral filaments on V-VIII: 4-4-4-5. Anal fin with 60-75 lateral filaments.

REARED SPECIMENS: St. Johns Co., Ditch on State Rd. #210, March 1966.

Flagler Co., Rayonier Ditch, February 1965; Little Haw Creek, June 1964.

Polk Co., Green Swamp, March 1963.

Clay Co., Black Creek, March 1962.

Jefferson Co., Lake Miccosuckee, September 1961; June 1963.

Leon Co., Chaoborus Pond, July 1965; Blue Sink, July 1966.

Duval Co., Sphagnum bog on U.S. Alt. #1, September 1963; November 1964; May 1961; St. John's River, March 1965.

P. hirtalatus differs from typical *Parachironomus* in the adult stage by having macrotrichia on the wings, as a larva in the distinctly projecting 6th lateral labial teeth and suggestion of trilobed median, and as a pupa in having a horn-shaped projection on the dorsum of the thorax.

Parachironomus pectinatellae (Dendy and Sublette)
new combination

Tendipes (*Cryptochironomus*) *pectinatellae* Dendy and Sublette, 1959: 516.

MALE: W.L. 1.9-2.2 mm; A.R. 2.7; L.R. 1.70. Head light brown with darker antennae and mouthparts. Mesonotum whitish with pale yellow vittae. P.A. bristles six. Legs pale, the fore femora brownish at base and apex, the fore tibiae and tarsi brown, apical two or three tarsal segments brown on mid and hind legs. Squama with hair fringe. Abdomen pale whitish to light brown. Male genitalia with dististyle incurved at apex, and anal point widened basally (see Dendy and Sublette, 1959).

LARVA: (Plate III, figure 1 a-e.) Head small, yellow; labial plate with 15 dark brown teeth, the median deeply cleft and the first laterals shorter than median or second laterals. Paralabials long with striae distinct to anterior margin which is smooth, not crenulate. Antennal ratio: 50:12:4:8:3. Premandibles with four blades. Claws of posterior proleg pale yellow, some with minute spines on inner margin.

PUPA: (Based on reared specimens from Arkansas). Pale brown, 3.7-4.0 mm long. Mesonotum nodulate dorsally; cephalic tubercles small and acutely pointed. Tergite II with approximately 60 brown hooked spines in posterior row, a narrow band of shagreen anterior to hooks. Tergites III-VI with paired patches of shagreen on posterior one-third to two-thirds of segment, shagreen less distinct on VI than on V.

There may be 1-3 very small caudo-lateral spines on VIII. Lateral filaments on V-VIII: 4-4-4-5, the 5th smaller and set in from margin. Anal fins bear 80-90 lateral filaments.

REARED SPECIMENS: None.

Adults of this species have been taken in light traps in Gadsden and Jackson counties in June and August through October.

Parachironomus alatus (Beck) new combination

Chironomus (*Cryptochironomus*) *alatus* Beck, 1962: 91.

MALE: W.L. 1.0 mm (1); A.R. 1.3; L.R. 1.8. Head brownish-yellow, antennal flagellum and palpi light brown; pedicel ochraceous; no frontal tubercles. Mesonotum yellowish to light brown with medium brown vittae and postnotum; P.A. bristles 2, squama bare. Legs pale with last tarsal segment on all legs and apical half of fore femora and tibiae medium brown. The two tibial spines on middle leg of unequal length. Wing membrane and veins light brown, punctuate, dark setae along R, R₁, and R₄₊₅. Abdomen pale greenish. Genitalia of male as in Plate I, figure 8.

FEMALE: W.L. 0.95 mm (2); coloration as in male, entire antenna brown.

LARVA: (Plate III, figures 2 a-e.) Head capsule pale; antennal ratio 50:16:4:16:6. Labial plate with 15 chocolate brown teeth, the 6th laterals distinctly projecting. Mandible with two dark lateral teeth; premandible with two blades. Preanal papillae with yellowish brown bristles; posterior prolegs with very sparse fine spines along both inner and outer margins of some claws.

PUPA: (Plate V, figure 8.) Very pale, 2.5 mm long; mesonotum apparently not nodulate; no cephalic tubercles, but a short pale bristle. No lateral lobes on segment II; posterior row on tergite II with 12-14 hooks. No pale sternal spines. Tergites II-VII with a pair of conspicuous dark median bristles near posterior border, a small spine patch between them with spines larger on each succeeding segment, those on VI forming an elongate oval patch suggesting a mace; tergite VII with very fine shagreen. Tergite VIII bare, no caudo-lateral spines. Lateral filaments on V-VIII: 4-4-4-5. Anal fins with 24-27 lateral filaments.

REARED SPECIMENS: Clay Co., Peter's Creek, March 1965, April 1965.

ADULT RECORDS: Light trap captures in Highlands Co. in August, St. Lucie Co. in April, Broward Co. in October, and paratype speci-

mens from Palm Beach Co. in August and from Lake Co. in August and September.

Several distinctive characters of this species in all stages make it different from all other known Florida species of the genus. It may not belong in *Parachironomus*, but as it does not fit precisely any group as yet described, we feel it best to include it here for the present. *P. alatus* differs as an adult in having a broader appendage 1 covered in dense microtrichia; as a larva in shape of the labial plate (somewhat similar to *hirtalatus*), antennal ratio; and as a pupa in the median posterior spine patch on VI which suggests a mace, and the lack of cephalic tubercles.

Genus *Cryptotendipes* Lenz

Cryptotendipes Lenz, 1941: 34. Genotype: *Chironomus usmaensis* Pagast [by present designation]; Lenz, 1959a: 238-250; Lenz, 1960c: 207.

Although *Cryptotendipes* is a *nomen nudum*, we prefer to retain the name rather than propose a new one. Lenz did not clearly designate a type and none has been designated since. As *anomalis* was described from a female, and as the pupa of *pseudotener* apparently does not have the stalked respiratory organ (assuming that Roback's (1957: 103) description is correct), we designate *Chironomus usmaensis* Pagast as the genotype.

It has been suggested that *Cladopelma* Kieffer (1921: 63) (genotype: *C. virescens* Meigen [fixation by Harnisch, 1923]) may belong in the genus *Cryptotendipes* and, if so, the correct name for the genus would be *Cladopelma*. However, the figures that Harnisch gives for the larva and pupa of *virescens* do not agree with *Cryptotendipes* in that the outer labial teeth of larva are not enlarged and projecting, and the pupa lacks the stalked respiratory organ, and seems rather to suggest *Microchironomus*. We therefore feel that until it is demonstrated that Harnisch's figures are not correct for *virescens* Meigen, and that the immatures of *virescens* do, in fact, conform with other species of *Cryptotendipes*, it is best to retain the name *Cryptotendipes* for this genus.

ADULT: Appendage 1 small, somewhat longer than wide, usually with three or more apical bristles; appendage 2 apparently lacking. Inner margin of dististyle is distinctly notched.

LARVA: Labial plate with all teeth equally dark, median domed and sometimes appearing broadly trilobed, with six or seven lateral teeth, the outer two or three greatly enlarged. Antennae five-segmented,

rather short in most species. Paralabials long, with distinct striations. Premandibles with two rather short blades; mandible with three shallow flat lateral teeth. Proleg claws are simple.

PUPA: Cephalic tubercles pointed with subapical bristle. Respiratory organ with long stalk basally, branched some distance from body, often nearly as long as pupal body. Posterior row of hooks on tergite II not interrupted medially. Posterior rows of coarse spines present on tergites III-VI or VII. Spines on VI or VII may be in a mace-like arrangement. Sternites I and/or II may have rows of pale spines, or pale spines on lobes. VIII has a long slender curved spine on each lateral margin about two thirds from base. Lateral filaments on V-VIII are 3-3-3-3 in type species, but are 4-4-4-4 in known Florida species.

Two species of this genus have been reared from Florida, *casuarius* (Townes), and an undescribed species. The species of this genus most nearly resemble those of the genus *Harnischia*, but the dark unnotched median labial tooth of the larva, the long stalked respiratory organ and the longer, slenderer spine on VIII of pupa, and the notched inner margin of the dististyle of adult male clearly separate the two genera.

Cryptotendipes casuarius (Townes) new combination

Chironomus (*Microchironomus*) sp. 1, Townes, 1938: 172 [*vide* Townes, 1945: 162].

Chironomus (*Chironomus*) sp. b, Miller, 1941: 63. [*vide* Townes, 1945: 162].

Harnischia (*Harnischia*) *casuaria* Townes, 1945: 162; Beck and Beck, 1959: 95.

MALE: W.L. 1.15-1.50 mm.; A.R. 1.6-2.0; L.R. 1.7-1.9. Head yellow, pedicel ochraceous, palpi light brown, antennae brown; no frontal tubercles present. Mesonotum yellowish with ochraceous vittae and postnotum. Legs yellowish, the forelegs and all apical tarsal segments darker. Wings almost colorless with pale brownish veins. Abdomen yellow-green. Male genitalia as in Plate I, figure 9.

FEMALE: Similar to male.

LARVA: (Plate III, figure 5 a-d.) Head capsule pale, the gula very dark. Antennal ratio 50:16:6:8.6. Preanal papillae with 8 yellowish bristles. Proleg claws yellow, simple.

PUPA: (Plate III, figure 3f; Plate V, figures 9, 9a.) Length 2.75-3.10 mm. Tergite II with posterior row of 14-20 hooks. Posterior row of coarse spines on tergites III-VII, and on sternites II-V or VI. Lateral filaments on V-VIII: 4-4-4-4; VIII with long slender curved lateral

spine about two-thirds from base of segment. Anal fin with 25-31 lateral filaments on each lobe.

We have experienced considerable difficulty in trying to separate *C. casuarius* and *C. emorsus*. Johannsen's (1937: 44) description of *Chironomus* (*Limnochironomus*) sp., which Townes suggests may be *emorsus*, does not clearly differ from the above pupa, except in having posterior spine rows on sternites II-VII, while our specimens have them only on sternites II-V or VI.

REARED SPECIMENS: Madison Co., Suwannee River, November 1963.
Duval Co., Beach Blvd. Creek, January 1962.
Flagler Co., Rayonier Ditch, May 1964.

Cryptotendipes sp.

Only one specimen has been reared (from Wakulla River at Highway 98, August 1967). As this specimen is imperfect we felt it best not to describe it until others are reared. It differs from *casuarius* as an adult in being larger: W.L. 1.65 mm.; A.R. 2.35; L.R. 1.75, and in lacking the median carina of the ninth tergite of the male genitalia. The pupa has posterior rows of broad spines on tergites III-VIII, those on VI and VII in two or more rows, those on VIII forming a round rosette-like patch. Sternite I has a row of pale spines on each side of the midline anteriorly and a small spined lobe lateral to each row. There are apparently no posterior rows of pale spines on the sternites. There is a pair of conspicuous bristles on II, and two pair on each succeeding tergite (also on each sternite?). Anal fins each bear 22 lateral filaments. The male genitalia of this species closely resemble *emorsus*, but the pupal cast of this specimen does not agree with Johannsen's (1937: 44) description of *Chironomus* (*Limnochironomus*) sp.

Genus *Harnischia* Kieffer

- Harnischia* Kieffer 1921: 69. Genotype: *Harnischia fuscimanus* Kieffer (monotypic) [fide Townes, 1945: 152]; Lenz, 1921: 15.
Chironomus Meigen. Malloch, 1915: 474 [partim].
Chironomus (*Harnischia*) Goetghebuer, 1928: 86.
Chironomus (*Chironomus*) group *Harnischia*. Edwards, 1929: 389 [partim]; Pagast, 1931: 210-211; Johannsen, 1937: 21; Goetghebuer, 1937: 47.
Cryptocladopelma Lenz, 1941: 34; Lenz, 1960b: 165-184; Lenz, 1960c: 212.
Harnischia (*Harnischia*). Townes, 1945: 152 [partim]; Roback, 1957: 100-103 [partim]; Beck and Beck, 1959: 95 [partim].
Chironomus (*Cryptochironomus*). Freeman, 1957: 382-405 [partim]; Sublette, 1964: 134 [partim]; Beck, 1961: 125 [partim]; Beck, 1962: 91 [partim].

Tendipes (Cryptochironomus). Dendy and Sublette, 1959: 516 [partim]; Sublette, 1960: 224-225 [partim]; Darby, 1962: 1-200 [partim].

[non] *Harnischia* Kieffer. Lenz, 1960a: 221 [Lenz's figure and description of the larva and pupa of "*H. fuscimanus*" must be a misidentification as a larva and pupa of the type described will produce an adult of the genus *Paracladopelma*].

LARVA: Labial plate dark, median teeth may be somewhat lighter and usually (not in *collator*²) notched. Paralabials with striations strong basally, fading anteriorly; premandible with two blades and a medio-lateral projection. Mandible with two dark squared lateral teeth and usually a dark area on shoulder.

PUPA: Cephalic tubercles usually large, pointed, with some spines. Posterior row of hooks on II divided medially. Sternites I and/or II with pale spine rows. Tergites III-V with double or triple posterior rows of coarse spines, paired on III and IV, contiguous on V and forming a mace-like pattern on VI. Lateral filaments on V-VIII: 4-4-4-4, VIII with a large lateral spine about two-thirds from base on each side. Anal fin with 35-55 lateral filaments.

Harnischia collator Townes

Chironomus (Microchironomus) sp. 2, Townes, 1958: 172 [fide Townes, 1945: 169].

Harnischia (Harnischia) collator Townes, 1945: 169; Beck and Beck, 1959: 95.

MALE: W.L. 1.4 mm; A.R. 2.6; L.R. 1.8-2.0. Head ochraceous, pedicel slightly darker, antennae and palpi brown; very small frontal tubercles present. Mesonotum pale yellowish white with vittae, sternum and postnotum orange-yellow. P.A. bristles 3. Legs light brown, foreleg beyond mid-femora and apical two or three tarsal segments on all legs darker brown. Wings and veins light brown, squama with 8 hairs. Abdomen yellow. Male genitalia as in Plate 1, figure 10.

FEMALE: None reared.

LARVA: (Plate IV, figures 1 a-e.) Head pale, gular area pale grayish-brown. Antennal ratio 50:20:2:4:2. Median tooth of labial plate does not appear to be notched. Preanal papillae with eight yellow bristles; proleg claws simple.

PUPA: (Plate IV, figure 1; Plate V, figures 12, 12a.) Medium brown, 4.0 mm long. Cephalic tubercles large, pointed, rough, but not distinctly spined. Abdominal segment I appears to have an anterior lobe on each side. Wing sheath with a tiny conical projection near base on outer margin. Tergite II with about 20 moderately large golden brown

hooks in a divided posterior row. Sternite I has a row of fairly long clear spines near posterior margin. Sternite II has anterior row of long pale spines. Tergites III-V with double or triple rows of short spines, divided on II-IV and contiguous on V. Tergite VI has a median posterior mace-like patch with 11-13 spines. VIII bears an almost straight spine on each lateral margin about five-eighths from base. Lateral filaments on V-VIII are 4-4-4-4. Anal fin with 40 lateral filaments.

REARED SPECIMENS: Duval Co., Beach Blvd. Creek, March 1964.

Harnischia galeator Townes

Harnischia (*Harnischia*) *galeator* Townes, 1945: 170; Beck and Beck, 1959: 95. *Chironomus* (*Cryptochironomus*) *galeator* (Townes), Sublette, 1964: 134.

MALE: W.L. 1.35 mm; A.R. 1.85; L.R. 1.85. Head deep yellow, post-ocular bristles in a single row, pedicel ochraceous, palpi and antennae light brown. Small frontal tubercles present. Mesonotum greenish-yellow with deeper orange vittae, and postnotum; P.A. bristles 3. Legs pale greenish-white, the forelegs beyond femora and all apical tarsal segments brown. Wings and veins light brown, squama with six (?) hairs. Abdomen greenish-yellow. Male genitalia as in Plate I, figure 11. The projecting hood of ninth tergite is strongly curved and the degree to which the anal point is covered by this hood depends on the angle at which the genitalia is mounted for viewing.

LARVA: (Plate IV, figures 2 a-e.) Head pale, the gular area dark brown apically. Antennal ratio 50:16:4:6:4. Labial plate with median tooth indistinctly notched. Preanal papillae with eight pale brown bristles; claws of prolegs yellow, simple.

PUPA: (Plate IV, figure 2 f; Plate V, figures 13, 13a.) Light brown, 3.75 mm. long. Cephalic tubercles rough with some spines. There is a small brown conical lobe near base of outer margin of wing sheath. Leg case of hind leg is spined. Sternite I has a patch of large pale spines on each side near anterior lateral margin. Sternite II with a short median row of small pale spines near posterior margin and an anterior band of longer pale spines. Tergite II has about 40 golden hooks in posterior divided row. Tergites III-V have divided paired rows of fairly broad spines near posterior margin with spiculation between; on VI there is a median mace-like patch containing about six brown spines. Segment VIII has an almost straight spine about five-eighths from base on each side. Anal fins with about 40 lateral filaments on each side.

REARED SPECIMENS: Columbia Co., Robinson's Creek, October 1965.

Jefferson Co., Lake Lafayette, April 1963.

Flagler Co., Rayonier Ditch, September 1966.

Seminole Co., Howell's Creek, October 1966.

Escambia Co., Canoe Creek, October 1967.

Harnischia viridulus (Linnaeus)

Tipula viridulus Linnaeus, 1767: 975 [*vide* Townes, 1945: 168].

Chironomus (Harnischia) viridulus (Linnaeus) Goetghebuer, 1928: 86.

Harnischia (Harnischia) viridulus (Linnaeus), Townes, 1945: 168; Beck and Beck, 1959: 95.

Tendipes (Cryptochironomus) viridulus (Linne), Sublette, 1960: 225.

MALE: W.L. 1.44 mm; A.R. 2.0; L.R. 2.0. Head dark yellow-brown, antennae and palpi brown. Mesonotum brownish-yellow with brown vittae and postnotum. P.A. bristles 3. Legs light brown with forelegs and all apical tarsal segments brown. Wings and veins very pale yellowish, squamal hairs 11+. Abdomen yellow-green. Male genitalia as in Plate I, figure 12.

FEMALE: None reared.

LARVA: (Plate IV, figures 3 a-e.) Head capsule pale, gula not darkened. Antennal ratio 50:15:4:4:2. Median labial tooth distinctly notched. Preanal papillae with eight yellow bristles; proleg claws pale yellow, simple. The larva and pupa of this species are similar to *amachaerus* as described by Roback (1957).

PUPA: (Plate IV, figure 3f; Plate V, figures 14, 14a.) Light brown, 4.0 mm long. Cephalic tubercle appears to be very small, but this may be the way it is mounted on slide. There is a small brown lobe near base of outer margin of wing sheath. Sternite I has anterior lateral lobes with a short double row of pale spines postero-medially from lobes, and a posterior row of moderately long pale slender spines. Sternite II has an anterior row of long spines arising from distinct alveoli and a short double median row of very pale spines near posterior border. A divided row of about 26 golden brown hooks posteriorly on tergite II. Tergites III-VI with posterior row of short broad pointed spines with a row or two of fine spines anterior to these; spine rows interrupted medially on III, IV, almost contiguous on V, and forming a mace-like patch on VI with six or seven spines. Lateral filaments on V-VIII: 4-4-4-4; VIII has a long spine, bent near middle, about five-eighths from base of segment. Anal fin bears 35 lateral filaments on each side.

REARED SPECIMENS: Duval Co., Expressway creek near U.S. #1, November 1964.

Harnischia boydi (Beck) new combination⁶

Chironomus (*Cryptochironomus*) *boydi* Beck, 1962: 91.

MALE: W.L. 1.25-1.4 mm; A.R. 2.0-2.16; L.R. 1.76-1.90. Head dark yellow, palpi and antennae brown, pedicel ochraceous. Small frontal tubercles present. Mesonotum green or yellow with deeper yellow vittae and postnotum. P.A. bristles three. Legs light brown, forelegs and all apical tarsal segments darker. Tibiae on middle leg bear only one apical spine each; tibiae on hind legs have two. Wings and veins pale brown, squama with 4+ (?) bristles. Abdomen yellow green. Male genitalia as in Plate I, figure 13.

FEMALE: None reared.

LARVA: (Plate IV, figures 4 a-e.) Head capsule pale with brownish gular and dark occipital rim. Antennal ratio 50:16:2:2:2. Labial plate with median tooth notched, median three teeth somewhat paler; seven lateral teeth, outer three somewhat separated from rest and projecting. Paralabials almost triangular, striae distinct but short. Preanal papillae with eight gray or brown bristles; proleg claws yellow, simple.

PUPA: (Plate IV, figure 4f; Plate V, figure 15.) Light brown, 3.6 mm. long. Cephalic tubercles rough but lacking distinct spines. Anterior lateral lobes on segment I. Sternite I has a posterior row of short pale spines; sternite II has an anterior row of long pale spines. Posterior hook row on II is interrupted medially and appears to be on a raised area. Tergites III-VI have two or three rows of short sharp spines, paired on II-IV, contiguous on V, and forming a mace-like patch on VI. Sternite IV has lateral whorls of fine spinules, and there are very small pale spines postero-laterally on V and VI. VII is spiculate on anterior half and on caudo-lateral corners. VIII has a large yellow lateral spine on each side about five-eighths from base, this spine fairly broad basally and distinctly bent at middle, ending in a point. Lateral filaments on V-VIII: 4-4-4-4. Anal fins bear 48-50 lateral filaments.

REARED SPECIMENS: Broward Co., Plantation Canal, September 1964. Flagler Co., Rayonier Ditch, November 1967. Duval Co., Expressway near U.S. 1, November 1964.

⁶This species may be a synonym for *Chironomus* (*Cryptochironomus*) *forcipis* Rempel, 1939.

Harnischia edwardsi (Kruseman)

Chironomus (*Chironomus*) *virescens* Meigen, Edwards, 1929: 391, [according to Townes, 1945: 167].

Tendipes (*Parachironomus*) *edwardsi* Kruseman, 1933: 194, [fide Townes, 1945: 167].

Harnischia (*Harnischia*) *edwardsi* (Kruseman). Townes, 1945: 167; Beck and Beck, 1959: 95.

Tendipes (*Cryptochironomus*) *edwardsi* Kruseman. Sublette, 1960: 224.

Chironomus (*Cryptochironomus*) *edwardsi* (Kruseman). Sublette, 1964a: 134.

MALE: W.L. 1.2-1.4 mm; A.R. 1.9; L.R.? Head yellowish, the palpi, antennae, and pedicel brown. Postocular bristles in a single row; small frontal tubercles present. Mesonotum yellow green with deep yellow vittae, sternum and postnotum. P.A. bristles two. Legs light brown, forelegs beyond femora and all apical tarsal segments brown. Wing membrane and veins light brown, punctate, squama with 2-3 (?) hairs. Abdomen greenish-yellow. Male genitalia as in Plate I, figure 14.

FEMALE: None reared.

LARVA: (Plate IV, figures 5 a-e.) Head pale with a part of the gular area darkened. Antennal ratio 50:15:3:8:3. Labial plate with median tooth deeply notched, almost appearing double, the median and first laterals slightly paler than outer teeth; fifth through seventh laterals somewhat separated off and projecting. Paralabial striae distinct, but short. Preanal papillae with long gray-yellow bristles; proleg claws yellow, simple.

PUPA: (Plate IV, figure 5f; Plate V, figure 16.) Pale yellow-brown, about 3.5 mm long. Cephalic tubercles large, pointed, spined. Tergite II with posterior divided row of yellow-gray hooks. Sternite II with anterior row of long pale spines and a divided posterior row of a few very small pale spines. Tergites III-VI with double or triple rows of spines, paired on III, IV, contiguous on V, and forming mace-like patch with about five large and six or seven smaller spines on VI. VIII has a lateral spine on each side about three-fourths from base of segment which is broad basally and bent in the middle. Lateral filaments on V-VIII: 4-4-4-4. Anal fins bear 55 lateral filaments on each side.

REARED SPECIMEN: Jackson Co., Apalachee Game Management Area, March 1963.

Genus *Paracladopelma* Harnisch

Paracladopelma Harnisch, 1923: 304. Genotype: *Paracladopelma camptolabis* Kieffer [original designation by Harnisch]; Lenz, 1941: 34; Lenz, 1959b:

429-449; Fittkau and Schlee, 1967: 374.

Chironomus Meigen. Malloch, 1915: 439 [partim].

Chironomus (*Chironomus*) Group *Cladopelma* Kieffer, *Paracladopelma* Harnisch. Edwards, 1929: 387 [partim]; Johannsen, 1937: 21.

Chironomus (*Cryptochironomus*) Group *Paracladopelma* Harnisch. Pagast, 1931: 209; Goetghebuer, 1937: 34.

Harnischia (*Cladopelma*) Kieffer. Townes, 1945: 147. [Townes designation of genotype: *Cladopelma laminata* Kieffer is in error as Harnisch, 1923, designated the genotype of *Cladopelma* as *virescens* Meigen. *C. virescens* does not belong in a genus with the other species here considered (i.e. *Paracladopelma*), so it follows that the correct name for the genus under consideration is not *Cladopelma*, but *Paracladopelma*]; Roback, 1957: 110.

ADULT: Both appendages of male genitalia present; appendage 1 broadened apically, covered with microtrichia and bearing a few bristles; appendage 2 usually smaller, rounded. Anal point triangular at base, shoulders of ninth tergite not angular. Reared Florida specimens may have small frontal tubercles present, 2-3 P.A. bristles, and 4-6 hairs on squama.

LARVA: Labial plate with broad median domed area, pale in Florida species, which may be notched to suggest small squared teeth; laterals dark and outermost may project very slightly. Paralabials wide with distinct striae to anterior margin of plate. Maxillary palps conspicuously long, the basal segment being more than one-half as long as first antennal segment. Antennae five-segmented, the second segment about one-half as long as the first. Premandibles with five or more blades. There is a pair of two-segmented sensory palps on the labrum and another small two-segmented palp near the base of each maxillary palp. Claws of prolegs are not spined.

PUPA: Cephalic tubercles small, acutely pointed. Posterior row of hooks on tergite II not divided usually less than one-half the width of the segment; no lateral lobes on I or II. Tergites III-VI with posterior spine rows of heavier spines which are paired on III-V and coalesced on VI. Lateral filaments on V-VIII: 4-4-4-5. VIII may have a comb of several spines fused basally (no specimens we have reared do). Anal fin bears 20-35 lateral filaments.

Paracladopelma undine (Townes) new combination

Harnischia (*Cladopelma*) *undine* Townes, 1945: 149; Roback, 1957.

Chironomus (*Cryptochironomus*) *undine* (Townes), Beck, 1961: 125.

MALE: W.L. 1.7 mm; L.R. 2.0; A.R. 1.9. Head, thorax and abdomen reddish brown, little color variation (teneral specimen?); no apparent frontal tubercles. P.A. bristles three, wing brown, setae at apex of

$R_4 +_5$ which is strongly downcurved at apex, squama with five hairs. Male genitalia as in Plate I, figure 15.

FEMALE: W.L. 1.8 mm. All brown, the vittae and postnotum being darkest. Legs brown, middle and hind femora somewhat lighter; two spines on tibiae of mid and hind legs. Wing brown with long dark setae along R, R_1 , and $R_4 +_5$, squama with five hairs. Genital lobe almost triangular.

LARVA: (Plate III, figures 6 a-d and g-i.) Head capsule pale, the posterior rim brown. Antennal ratio 50:12:2:2:1. Labial plate with pale median area of four shallow squared teeth, with six slightly darkened lateral teeth, the outer two more pointed and slightly longer. Mandible with three pale lateral teeth, comb of two bristles and brush of four unfringed branches. Premandible with four dark blades, the outer very thin. This larva is very similar to Roback's (1957) description of the larva of *nais*, except that that species has the head capsule dark, and the paralabials appear to be wider.

PUPA: (Plate III, figure 4 f; Plate V, figure 10.) Brown, 3.7 mm. long. Cephalic tubercles small, slender, with pointed apex. Tergite II with posterior row of approximately 50 hooks. Tergites III-V with paired patches of coarse spines posteriorly, joined by finer spines; patches coalesced on VI. Tergite VIII has spiculate antero-lateral patches. Anal fins bear 30 lateral filaments. Male genital sac apparently shorter than anal fins.

REARED SPECIMENS: Okaloosa Co., Juniper Creek, February 1966.

Paracladopelma loganae new species

MALE HOLOTYPE: W.L. 1.55 mm; A.R. 2.0; L.R. 1.8. Collected in Escambia County, Perdido River, February 2, 1966 (USNM). Head yellowish, pedicel and antennae brown, apical segment of palpi paler. P.O. bristles in single row; small frontal tubercles present. Mesonotum yellowish-brown with ochraceous vittae; sternum, small pleural spot anterior to wing, and postnotum dark brown; P.A. bristles 3 (or 4). Legs pale brown, forelegs beyond femora and all apical tarsal segments darker brown; mid and hind tibiae each bear two spines. Wing light brown, dark setae along apex of $R_4 +_5$; squama with four or five hairs. Abdomen brown. Male genitalia as in Plate I, figure 16.

FEMALE ALLOTYPE: W.L. 1.45 mm. Very pale brownish with brown vittae, sternum and postnotum. Wing membrane and veins brown, squama with six or seven hairs. Legs brown, forelegs and apices of

all legs slightly darker. Abdomen brown. Spermathecae two, clear, flask-shaped, approximately 0.05 mm in diameter.

LARVA: (Plate III, figures 7 a-d and g-i.) Head capsule pale, occipital rim not darkened. Antennal ratio 50:28:2:2:2, blade arising from near base of the second segment. Mandible with three lateral teeth, the basal one pale and very sharply pointed; brush with four branches; comb of seven or eight bristles.

PUPA: (Plate III, figure 5 f; Plate V, figure 11.) Light brown, 3.9 mm long. Cephalic tubercles brown, approximately 0.02 mm long with sharp pointed apex and a subapical bristle. Tergites III-VI with posterior median brownish area of three to four rows of small triangular spines, in paired patches joined medially by paler, smaller spines. Anal fin with 32 lateral filaments. Male genital sac bluntly rounded at tips and about two-thirds as long as anal fins.

REARED SPECIMENS: (Paratypes) Escambia Co., Perdido River, 7 February 1966 (2 males, 3 females); Bradford Co., Santa Fe River Drainage, 20 March 1968 (4 males).

We take pleasure in naming this species for Miss Lucile Logan, longtime associate and friend.

DISCUSSION

ECOLOGY

For many of the species within this group we have too few specimens to indicate much of either their ecology or zoogeography, but we do have enough records for some to show the types of water they inhabit. The genus *Demicryptochironomus* appears to contain species confined to our swiftest waters. *Paracladopelma undine*, *P. loganae*, and *H. collator* have been found only in running water in Florida. Species confined to standing waters or streams of extremely low velocity are *Parachironomus alatus*, *P. pectinatellae*, *P. directus*, *P. monochromus*, *P. hirtalatus*, *P. sublettei*, and *Harnischia boydi*. In addition *P. sublettei* and *H. boydi* larvae occur most frequently in the canals of southeastern Florida, a fact of, perhaps, greater significance in zoogeography than in their ecology. *Parachironomus carinatus*, *P. schneideri*, *Harnischia viridulus*, *H. edwardsi*, and *H. galeator* are ubiquitous. Of all the species of this group thus far known from Florida *Parachironomus alatus* is probably the most restricted ecologically, the larvae being found only in sphagnum bogs and in dense vegetation in other highly acid waters.

ZOOGEOGRAPHY

A brief review of the literature on chironomids in the United States shows that in only a few widely scattered areas has any significant study of local chironomid faunas been made. Thus the group's zoogeography can be discussed only in general terms.

Three local species — *Parachironomus monochromus*, *Harnischia edwardsi*, and *H. viridulus* — are holarctic in distribution. Species of nearctic distribution are *Parachironomus carinatus*, *Harnischia galeator*, *H. collator*, *Paracladopelma undine*, and *Cryptotendipes casuarius*. Species thus far confined to the extreme southeastern United States are *Parachironomus pectinatellae* (Alabama and Florida) and *P. directus* (Louisiana, Alabama, and Florida). There is a strong possibility that *Parachironomus sublettei* and *Harnischia boydi* may be neotropical in distribution (see footnote 6). At the present stage of our knowledge the following four species seem to be endemic to Florida: *Parachironomus alatus*, *P. schneiderei*, *P. hirtalatus*, and *Paracladopelma loganae*.

Our extensive larval collections contain representatives of many species that have not yet been reared. Thus the present discussion of the *Harnischia* group is necessarily incomplete.

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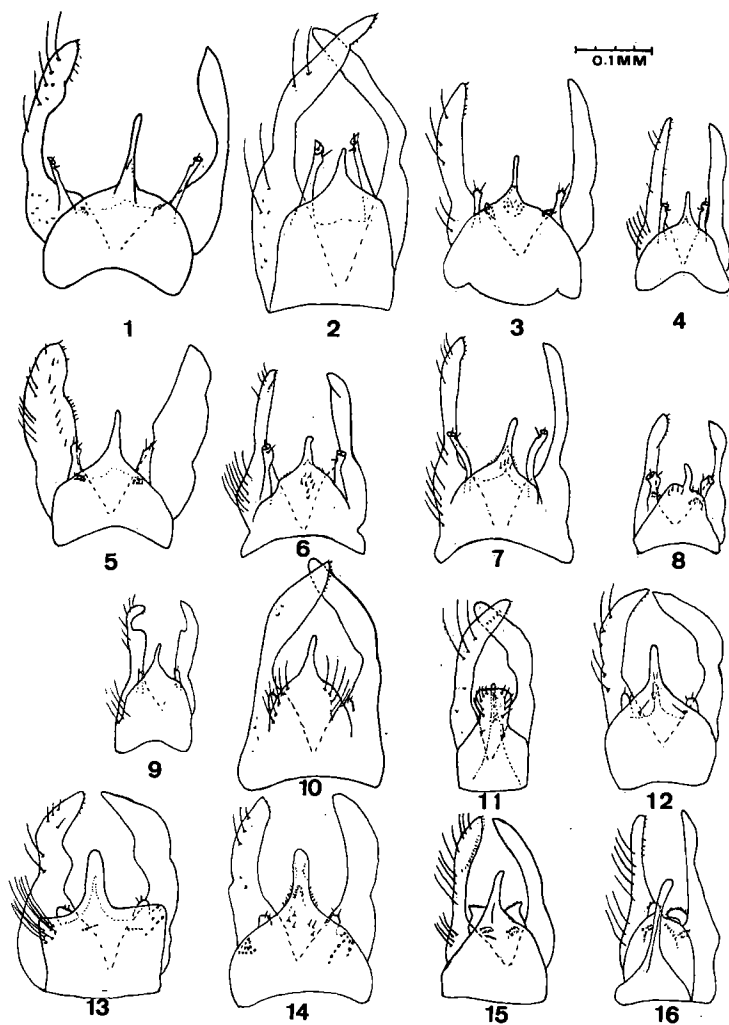


Plate I

Male Genitalia

- | | |
|--------------------------------------|------------------------------------|
| 1. <i>Parachironomus monochromus</i> | 9. <i>Cryptotendipes casuarius</i> |
| 2. <i>P. tenuicaudatus</i> | 10. <i>Harnischia collator</i> |
| 3. <i>P. schneideri</i> | 11. <i>H. galeator</i> |
| 4. <i>P. directus</i> | 12. <i>H. viridulus</i> |
| 5. <i>P. sublettei</i> | 13. <i>H. boydi</i> |
| 6. <i>P. carinatus</i> | 14. <i>H. edwardsi</i> |
| 7. <i>P. hirtalatus</i> | 15. <i>Paracladopelma undine</i> |
| 8. <i>P. alatus</i> | 16. <i>P. loganae</i> |

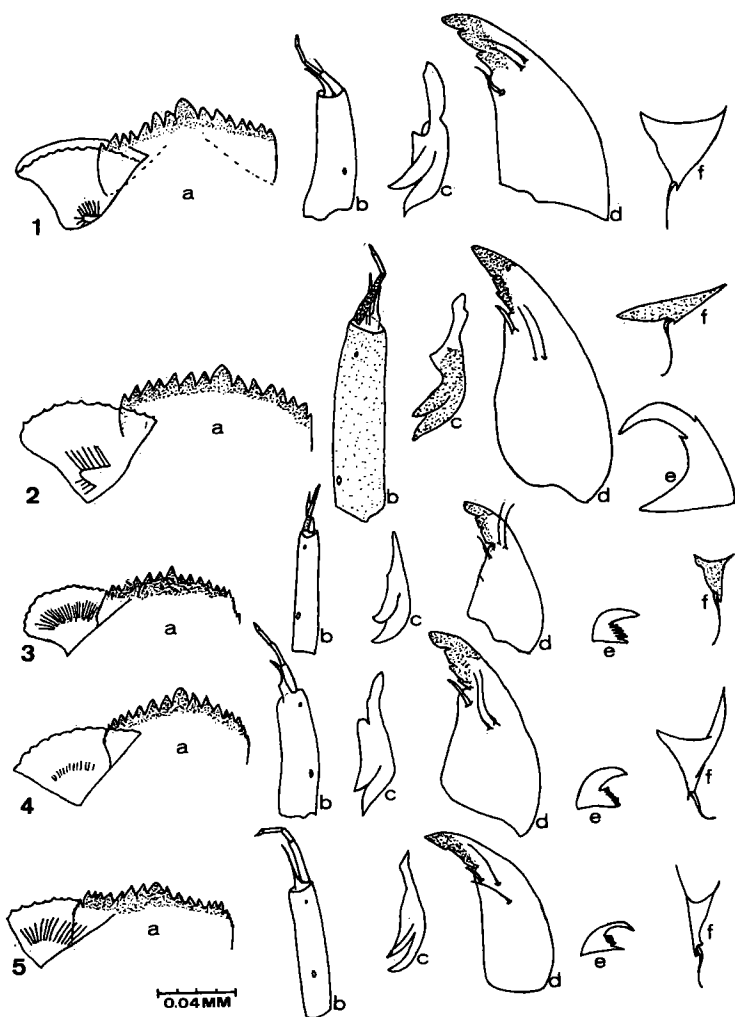


Plate II

1. *monochromus*
2. *schneideri*
3. *directus*
4. *sublettei*
5. *carinatus*

- a. larval labial plate
- b. antenna
- c. premandible
- d. mandible
- e. claw of posterior proleg
- f. pupal cephalic tubercle

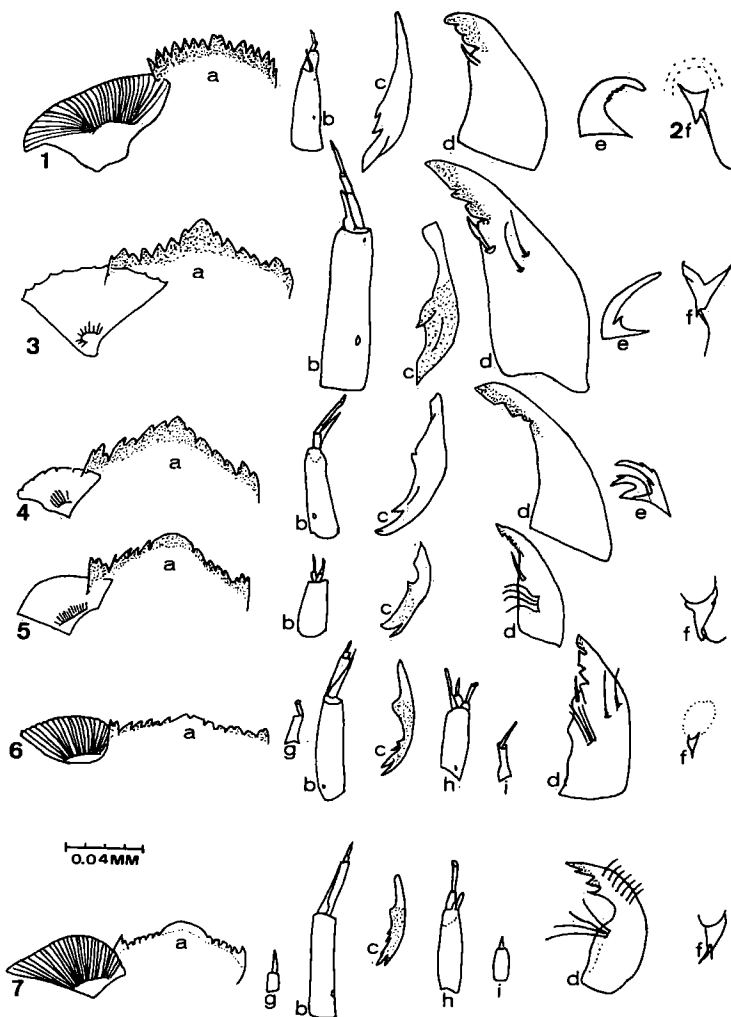


Plate III

1. *pectinitellae*
2. *tenuicaudatus*
3. *hirtalatus*
4. *alatus*
5. *casuarius*
6. *undine*
7. *loganae*

- a. larval labial plate
- b. antenna
- c. premandible
- d. mandible
- e. claw of posterior proleg
- f. pupal cephalic tubercle
- g. sensory palp of labrum of larva
- h. maxillary palp of larva
- i. palp near base of maxillary palp

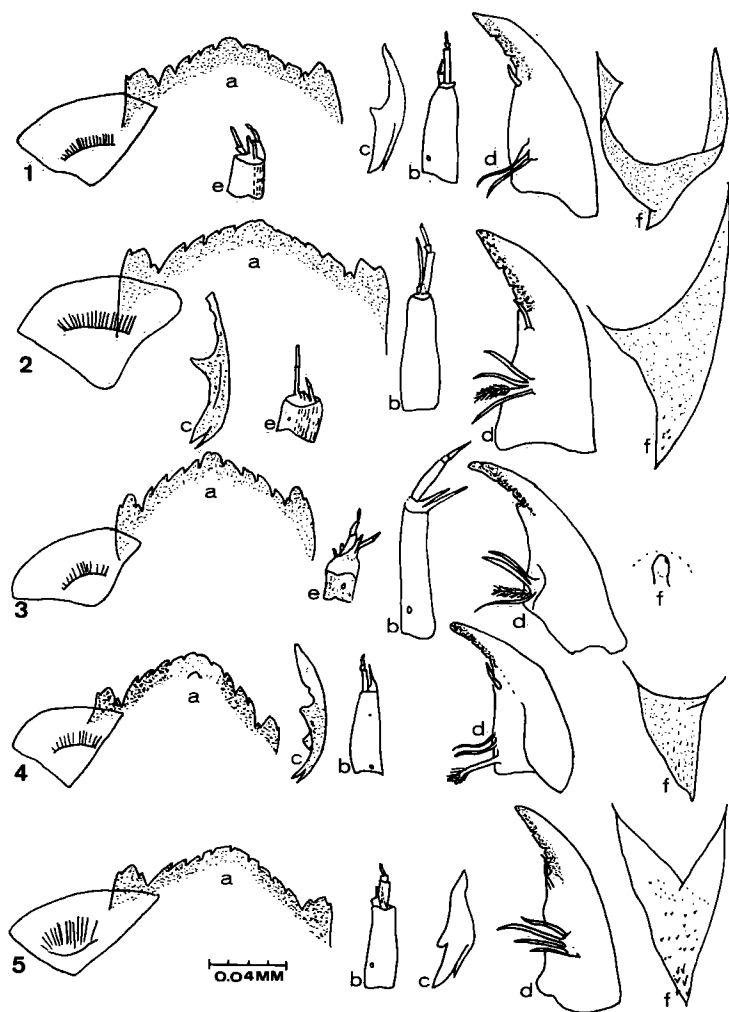


Plate IV

1. *collator*
2. *galeator*
3. *viridulus*
4. *boydi*
5. *edwardsi*

- a. larval labial plate
- b. antenna
- c. premandible
- d. mandible
- e. maxillary palp
- f. cephalic tubercle of pupa

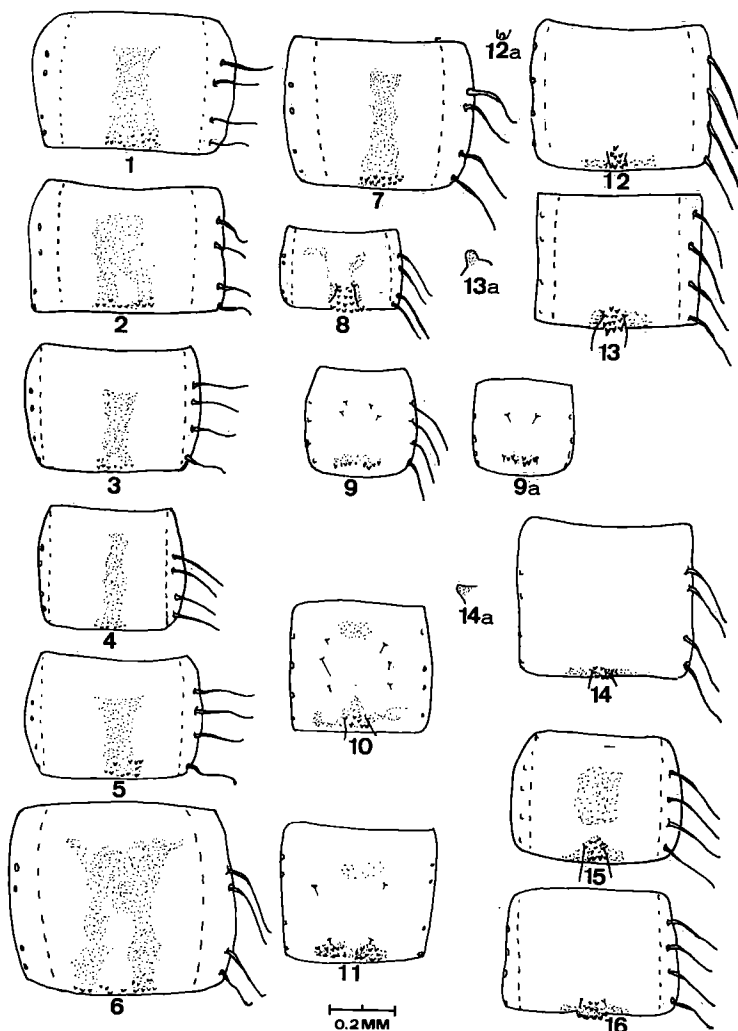


Plate V

Pupal tergite VI: 1. *monochromus*; 2. *schneideri*; 3. *directus*; 4. *sublettei*; 5. *carinatus*; 6. *tenuicaudatus*; 7. *hirtalatus*; 8. *alatus*; 9. *casuarius*; 10. *undine*; 11. *loganae*; 12. *collator*; 13. *galeator*; 14. *viridulus*; 15. *boydi*; 16. *edwardsi*.

Pupal tergite VII: 9a *casuarius*

Mesonotal tubercle of pupa: 12a. *collator*; 13a. *galeator*; 14a. *viridulus*.

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