Studies of Neotropical Caddisflies, XXX: Larvae of the Genera of South American Limnephilidae (Trichoptera)

OLIVER S. FLINT, JR.

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ABSTRACT

Flint, Oliver S., Jr. Studies of Neotropical Caddisflies, XXX: Larvae of the Genera of South American Limnephilidae (Trichoptera). *Smithsonian Contributions to Zoology*, number 355, 30 pages, 77 figures, 1982.—Larvae of the type-species of all the known South American genera of Limnephilidae are described and figured, and a key is presented to aid in their identification. Species described are *Anomalocosmoecus blancasi* Schmid, *Austrocosmoecus hirsutus* Schmid, *Magellomyia appendiculata* (Ulmer), *Metacosmoecus nigrofasciatus* Schmid, *Monocosmoecus vanderweeli* Ulmer, and *Platycosmoecus beaumonti* (Schmid). A larva, presumed to be that of *Antarctoecia nordenskioeldi* Ulmer, the only other genus known to occur on the continent, is also described. *Magellomyia subtropicalis* Schmid and *M. illiesi* Marlier are transferred to *Anomalocosmoecus* (new combinations), and *Limnephilus patagonicus* Ulmer and *L. setipes* Ulmer are synonymized with *Magellomyia appendiculata* (Ulmer) (new synonymies).

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Contents

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Oliver S. Flint, Jr.

Introduction

The family Limnephilidae, one of the dominant caddisfly families in the North Temperate Zone, has limited representation in the Southern Hemisphere. There is no known species from the Afrotropical region, and only one genus with two species from the Australian; however, southern South America has a small but significant fauna of this family. Currently I am able to recognize seven genera with at least 27 species for the area. Most are wholly restricted to the Chilean subregion, but two genera occur in the Andes from northern Argentina north to southern Colombia.

My trips to Chile and adjacent patagonian Argentina and those of my coworkers at the National Museum of Natural History have resulted in many collections of larvae and adults of this family, which are supplemented by small but important collections made by others in the Andes farther to the north. These collections contain the larvae of the type-species of all but one genus firmly associated with the adults by means of male or female metamorphotypes. A larva is tentatively attributed to the one remaining genus based on locality and by process of elimination.

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Detailed descriptions and illustrations are given for the larvae of these species. A key is also presented to aid other workers in the separation of larvae they may encounter. However, no phylogenetic analysis is made. This will appear in a future paper analyzing all genera of the Dicosmoecinae (Flint and Wiggins, in prep.).

The terminology used here generally follows that of Wiggins (1977). I have departed from his usage in calling certain abdominal structures bifid processes rather than lateral tubercles.

The gill diagrams offered in this study (Figures 1–7) are schematic representations of one side of a larval abdomen showing the number of filaments in a cluster and the placement of the gill clusters. There is considerable variation in the exact number of filaments; the numbers shown are the counts made on one side of a randomly selected specimen.

ACKNOWLEDGMENTS.—I am very appreciative of the excellent illustrations of the larvae done primarily by Anne E. Lacy, and the equally fine figures (9–11) of L. Michael Druckenbrod.

Grant funds from the U.S. Antarctic Research Program (National Science Foundation), American Philosophical Society, and Fluid Research Fund (Smithsonian Institution) have made possible my fieldwork in Argentina and Chile.

Family LIMNEPHILIDAE

Subfamily DICOSMOECINAE Schmid

This subfamily was established by Schmid (1955) for a number of genera that appeared to be the more primitive ones of the family, although a number are clearly of a rather specialized, relictual nature. They are strongly circum-Pacific in distribution, with most genera and species found in the eastern Orient, northwestern North America, and southwestern South America. A single species is found throughout Europe, several reach eastern North America, and one genus from Australia was recently transferred to the subfamily (Flint, 1960). All the South American genera known in 1955 were placed in this subfamily at its conception, as have been those described subsequently.

The larval characteristics of this subfamily were outlined by Flint (1960) and Wiggins (1977). The larvae of the genera here described conform in general to these definitions, only *Anomalocosmoecus* offering an exception. This is the only known genus in the subfamily with an entire, scooplike apex to the mandibles; however, in all other characteristics it clearly belongs to the subfamily. The presence of three or more major setae on the ventral margin of the mid- and hind femora remains the diagnostic characteristic for the larvae of this subfamily.

Key to the Genera of the Subfamily Dicosmoecinae

1. First abdominal segment dorsally with 4 sclerites; head and thoracic nota bearing large, spikelike setae; forefemur with basal half of ventral margin expanded ..... ***Platycosmoecus***
   First abdominal segment without sclerites; head and thoracic nota with normal setae; forefemur without expanded basal half 2
2. Mandibles with tips entire, scooplike; head with a dorsolateral ridge or carina ..... ***Anomalocosmoecus***
   Mandibles with tips divided into a series of teeth; head without a dorsal carina 3
3. Tibiae of all legs with 2 rows of bladelike setae on inner margins ..... ?***Antarctoecia***
   Tibiae either totally smooth with only an apical pair of bladelike setae, or with a fringe of short hair 4
4. Anal prolegs ventrally with setae on membrane 5
   Anal prolegs ventrally without setae 6
5. Ovoid rings outlining chloride epithelia on venter of abdominal segments 2–7, each about 8 times wider than long ..... ***Metacosmoecus***
   Ovoid rings on venter of segments 3–7, that on 3 often greatly reduced, each 3–4 times wider than long ..... ***Magellomyia***
6. With a distinct pale stripe middorsally on head, pro- and mesonota; mid- and hind tibiae and tarsi often with a fringe of short hair on inner margin ..... ***Monocosmoecus***
   Without a longitudinal pale stripe, head with distinctive muscle scars; no fringe on inner margin of mid- and hind tibiae and tarsi ..... ***Austrocosmoecus***

Genus *Anomalocosmoecus* Schmid

The genus was established for a single species, *A. blancasi* Schmid, collected at Lake Titicaca in Peru. The following two species are transferred to *Anomalocosmoecus* (both new combinations). *Magellomyia subtropicalis* Schmid is based on a single female specimen collected in Peru, which cannot now be located. *Magellomyia illiesi* Marlier was described from northern Peru in all its stages. I have studied the female of *A. blancasi* and find that its genitalia and those illustrated for the females of the other two species are indistinguishable, as are the figures of the male genitalia of *A. blancasi* and *A. illiesi.* All are congeneric, and because the larvae of *A. blancasi* and *A. illiesi* are so distinctive, I am retaining *Anomalocosmoecus* for this group.

A. blancasi appears to be restricted to Lake Titicaca, but *A. illiesi* ranges from Peru to southern Colombia at higher elevations along the Andes.

RECOGNITION.—Based on the larvae of *A. blancasi* and *A. illiesi*, the following characteristics are distinctive. Head has a lateral ridge or carina that bears the primary dorsal setae. The mandibles have a scooplike, untoothed apex. The tibiae of all legs have enlarged setae on the inner margins. The abdomen bears chloride epithelia on the venter of segments 2 or 3 to 7, and the anal prolegs do not bear any setae ventrally.

Anomalocosmoecus blancasi Schmid

FIGURES 1, 9–17

Anomalocosmoecus blancasi Schmid, 1957:390–391.—Flint, 1980:216.

The larvae here described are associated with the adults by means of a male metamorphotype. The larvae of *A. illiesi* were described by Marlier (1963), and I also possess several collections from Ecuador with male metamorphotypes. The larvae of the two species are easily separated by the sharp carina around the head in *A. illiesi* (Figure 8) as opposed to the low broad ridge in *A. blancasi* (Figure 11).

LARVA.—Length to 11 mm, width 3 mm. Sclerites of head and thorax reddish-brown, muscle scars small, indistinct, and pale. Surface of head, except anteromesally, with minute asperites; meso- and metanota with asperites.

Head slightly depressed frontally, the area surrounded laterally and posteriorly with a low, broad ridge that bears the primary dorsal setae of the genae. Labrum with anterolateral brushes small and short. Mandibles with mesal brushes large; apices entire and scooplike. Maxilla with palpus normal, mesal lobes small. Labium with area between ventral rods lightly sclerotized; submental setae arising from small sclerites, submentum lightly sclerotized mesally. Gular line rather short; gula completely filling between ecdysal lines.

Pronotum with anterior margin bearing a row of short, spinelike setae, a few long setae and a very sparse, short fringe; surface with a few normal, long setae and scattered spinelike setae; transverse depression obsolete. Mesonotum with plates well developed, with a few secondary setae between primary setal areas. Metanotum with 3 pairs of sclerites well separated, multisetate; membrane with secondary setae along posterior and lateral areas. Prosternal horn not attaining apex of forecoxa; plate indistinct. Meso- and metasterna with 3–6 short setae; mesosternum with 3–6 small sclerites posteriorly. Foreleg with several short, pale, bladelike setae apically on trochanter, brush lacking; femur with 3 major ventral setae pale and bladelike, a row of short, spinelike setae on ventral margin; tibia with an irregular double row of pale blades and a serrate surface on inner margin; tarsus with inner margin serrate, and 1–2 bladelike setae; basal seta of tarsal claw ¼ the length of claw. Mid- and hind legs essentially identical; trochanter with an apicoventral bladelike seta, 3 longer, darker setae, and a few small pale setae; femora with ventral margin bearing 4 large setae and a row of smaller, spinelike setae and hairs; tibiae and tarsi with an irregular double row of short, bladelike setae and a serrate surface on inner margins; basal seta of tarsal claws ¼ the length of claw.

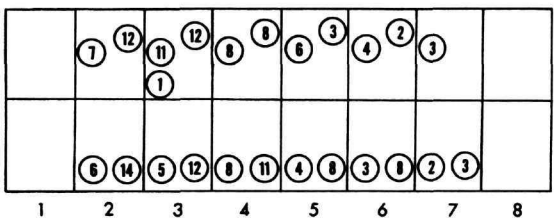

FIGURE 1.—Gill diagram, *Anomalocosmoecus blancasi* Schmid.

Abdomen with gills as shown in Figure 1. Lateral line from middle of segment 2 to middle of segment 8. Bifid processes present on segments 3–7, with 6–8 processes per segment. Chloride epithelia present ventrally on segments 3–7, anteriormost ovoid rings about 2½ times broader than long, rings broader posteriad, about 4 times as broad as long. First segment with humps well developed, ventral hump broadly transverse; setae in all areas, larger setae arising from sclerotized bases. Eighth tergum with a sparse row of mostly short setae posteriorly. Ninth tergum with tergite light brown, with numerous setae along posterior margin and continuing as an irregular row on membrane laterally; venter with 2 pairs of setae, with the mesalmost half the length of the lateral. Anal prolegs with a few, mostly short, setae on lateral plate; basal tuft of 3 setae; membranous ventral area without setae.

CASE.—Constructed of fragments of mollusk shells, flat scales of marl, and pieces of plant. Tapered posteriad and slightly curved. Posterior end narrowed with silk and fragments, with a large central opening.

MATERIAL.—*Bolivia*, Lago Titicaca, Copacabana Bay, 21 June 1977, Roback and Goulden, 3 larvae; same, but east end Copacabana Bay, littoral zone in *Elodea* and totora beds, 21–22 June 1977, C. Goulden, 1 teneral ♂, 1♂ metamorphotype, 3 cases.

HABITAT.—All collections made of this species are from Lake Titicaca. The collections here reported were made either in the littoral in *Elodea* and *Scirpus* beds or by dredging at a depth of 5 m (Roback, 1980).

Collections of *A. illiesi* larvae are primarily from small, tumbling mountain streams in the paramo or upper yungan areas.

Genus *?Antarctoecia* Ulmer

This is a monotypic genus known with certainty only from the provinces of Jujuy and Catamarca in Argentina at elevations of 4500–5000 meters. The larva here described from Bolivia is attributed to the genus exclusively by process of elimination. If it is not *Antarctoecia*, then it must be the larva of some undescribed species.

RECOGNITION.—This larva is quite distinctive. The mandibles are toothed. The thorax bears many short, dark, bladelike setae on all nota, including the membranous areas of the metanotum. The tibiae and tarsi of all legs bear 2 irregular rows of bladelike setae on their inner margins. The first abdominal segment is very hairy, though the ventral regions of the anal prolegs are without setae.

?Antarctoecia nordenskioeldi Ulmer

FIGURES 2, 18–26

Antarctoecia nordenskioeldi Ulmer, 1905:65–66.—Schmid, 1949b:591–600; 1955:43–45.

The single larva here described is assigned to this genus and species strictly by the process of elimination. This is the only species of the family that is known to occur in this area whose larvae are as yet undescribed.

LARVA.—Length 15 mm, width 4 mm. Sclerites of the head and thorax reddish brown; muscle scars of head slightly darkened, especially around their margins. Frontoclypeus smooth on anterior half, remainder of head and pro- and mesonota covered by very small asperites.

Head hypognathous, lacking ridges and secondary setae. Labrum with anterolateral brush small, dorsomesal surface produced into a low broad hump. Mandibles with mesal brushes large; both with 3 apical teeth. Maxilla with galeal brush well developed; palpus slightly longer than galea. Labium with area between

ventral rods broadly and slightly sclerotized; submental seta arising from anterolateral angle of a large, elongate sclerite. Gula with apex narrowly elongate, filling 85% of ventral ecdysal line, which is shorter than in most genera.

Pronotum with anterior margin bearing a sparse fringe of pale, thin hairs and larger, thicker hairs; surface with unusually broad setae, both short and long, scattered over entire surface; transverse depression lacking. Mesonotum with plates well developed, with many short, dark, enlarged setae uniting the 3 primary setal areas. Metanotal setal plates well developed; membrane with many short, dark, enlarged setae scattered over entire surface. Prosternal horn shorter than forecoxa; plate well developed, pentagonal. Mesosternum with sclerotized points posterolaterally; mesally with a pair of large setae arising from sclerotized bases, as well as 10 smaller setae. Metasternum with a pair of large setae arising from sclerotized bases, and 25 smaller setae of various lengths. Foreleg lacking trochanteral brush, bearing a comb of enlarged, pale, bladelike setae on ventral and inner surface, femur with 5 large and 8 small, pale, bladelike setae ventrally, inner and outer surfaces with 2 and 1 large, black apical setae, respectively; tibia with inner margin bearing 2 well-developed rows of pale, bladelike setae, 6 setae to the row; tarsus with inner margin bearing 2 rows of pale, peglike setae; claw with basal seta about ⅓ the length of the claw, which is gently curved. Mid- and hind legs essentially identical: lacking trochanteral brush, with a comb of enlarged, pale, bladelike setae on ventral and inner surfaces; femur with 2 large, dark and 10 pale, bladelike setae of various lengths on ventral margin, inner surface with a row of 6 large, dark setae; tibia with inner margin bearing 2 rows of well-developed bladelike setae, each of 5–6 setae; tarsus with 2 rows of pale, peglike setae on inner margin; claw with basal seta about ⅓ the length of the claw, which is gently curved.

Abdomen with gills as in Figure 2. Lateral line well developed from middle of segment 2 to posterior of segment 8. Bifid processes lacking (or lost on this specimen?). Chloride epithelia on

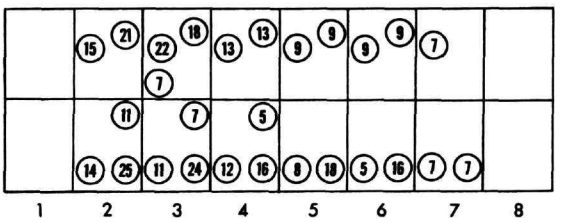

FIGURE 2.—Gill diagram, *?Antarctoecia nordenskioeldi* Ulmer.

venter of segments 2–7, in form of a transverse ovoid ring, but with anterior margin slightly constricted on each side. First segment with dorsal hump large, very broad, almost completely occupying dorsum; lateral humps large; ventral hump large and transverse; entire surface (except tips of lateral humps) covered with setae, the largest arising from sclerotized bases. Second tergum with about 15 scattered setae; terga 3–5 each with a pair of large submesal setae; tergum 6 with 1 or 2 smaller additional setae; tergum 7 with about 10 small setae on each side in addition to several large setae; tergum 8 with a large number of setae, many of which are large and dark. Ninth tergite brownish, bearing many setae, of which at least 10 are long; with a band of scattered setae from tergite around sides and meeting ventrally where there are several larger setae arising from small sclerites. Anal proleg with many long and short setae on lateral plate, basal tuft consisting of 4–5 long setae and several short ones; membranous area without setae.

CASE.—Made of plant material, primarily elongate pieces of grass. Circular in cross-section, very slightly tapered and curved posteriorly. Pieces placed transversely or obliquely around case, those at posterior extending freely, giving case a "shaggy" appearance. Posterior aperture narrowed by silk and vegetal matter, with an irregularly circular central opening.

MATERIAL.—*Bolivia*, Departmento Cochabamba, 48 km north of Cochabamba at Corani Dam (about 9000′, or 2900 m), 10 May 1969, P. and P. Spangler, 1 larva.

HABITAT.—Field notes made by Paul Spangler (unpublished) indicate that caddisfly larvae were

taken in meadow pools alongside small, spring-fed brooks. The area is a typical puna grassland.

Genus *Austrocosmoecus* Schmid

This monotypic genus is widely distributed from the Straits of Magellan north along the Andes to south central Chile and adjacent Argentina.

RECOGNITION.—The larvae are easily recognized by the following characteristics: The head and thoracic nota are smooth and shining, lacking the usual asperites found in most other genera. The head and thorax lack the pale central stripe of *Monocosmoecus*, but have many, small, pale muscle scars on a reddish-brown background. The mandibles are toothed apically. The tibiae and tarsi of mid- and hind legs lack serrations or setae (except for the apical pair) on their inner margins. The anal prolegs lack setae on their membranous ventral portion.

Austrocosmoecus hirsutus Schmid

FIGURES 3, 27–35

Stenophylax hyadesi.—Ulmer, 1904:14–17 [in part, larvae only].—Flint, 1974[1975]:84. [Not Mabille.]
Austrocosmoecus hirsutus Schmid, 1955:54–56; 1964:326.—Marlier, 1963:248–251.—Flint, 1974[1975]:88.

This species is widespread and often very abundant in the small mountain brooks and streams in the forested areas of Chile and southern Argentina. Marlier (1963) described and figured the larval sclerites and pupa of this species. Ulmer (1904), first described the larvae under the name *Stenophylax hyadesi*, although the adults he described were *hyadesi*. I possess several collections containing male and female metamorphotypes of this species.

LARVA.—Length to 21 mm, width to 4.5 mm. Sclerites of head and thorax reddish brown, muscle scars small, pale, not dark rimmed. Surface of sclerites smooth and shining.

Head hypognathous; lacking ridges and secondary setae. Labrum with small anterolateral brushes. Mandibles with large mesal brushes; right and left with 5 apical teeth. Maxilla with galeal brush well developed. Labium with area between ventral rods filled by a dark, rugose surface; submental setae arising from well defined, trianguloid sclerites, approximate on midline, remainder of submentum lightly sclerotized. Gula with apex narrowly elongate; filling ¾ of ventral ecdysal line.

Pronotum with anterior margin bearing a row of long, dark setae, another row of intermediate length, dark setae, and fringe of pale, fine hairs; surface with a number of secondary setae; transverse depression shallow and broad. Mesonotum with plates well developed, setal areas (sa) bearing many setae and tending to coalesce. Metanotum with sa 1, sa 2, and sa 3 represented by large plates bearing many setae; membrane with a few setae immediately laterad of sa 1; with a series of small sclerotized points, especially laterally in anterior groove. Prosternal horn well developed, as long as forecoxae; plate large, well sclerotized, rectanguloid in shape. Meso- and metasterna with rows of sclerotized points, especially posterolaterally. Foreleg with trochanter bearing a number of pale, broad, setae ventrally, brush well developed and bearing 2 broad, pale setae; femur with ventral margin bearing 2 broad, pale setae, a comb of short, pale setae and a brush of pale hairs on basal half; tibia with a comb of very short, pale setae on apical third of inner margin, apical spurs large, bladelike; basal seta of tarsal claw about ⅓ the length of the claw, which is strongly curved. Midleg with trochanteral brush small and with a single, apical, pale, bladelike seta; femur with 6 large setae along venter, and a comb of very short, pale setae on basal third; ventral margin of tibia and tarsus unornamented, apical spurs pale, bladelike; basal seta of tarsal claw about ⅓ the length of the claw, which is strongly curved. Hind leg with trochanteral brush very small, with a single, pale, bladelike seta apically; femur ventrally with 6 major setae, comb reduced to a few minute points on basal quarter; ventral margin of tibia and tarsus unornamented, tibial spurs large, pale, bladelike;

basal seta of tarsal claw about ⅓ the length of the claw, which is strongly curved.

Abdomen with gills as shown in Figure 3. Lateral line well developed, from posterior of segment 2 to posterior of segment 8. Bifid processes present on segments 3–8, 2–3 processes on segment 3, 6–8 on other segments. Chloride epithelia in form of ovoid sclerotized rings on segments 2–7. First segment with humps well developed, venter with a broad, transverse hump; segment very hairy, dorsally and ventrally, larger setae arising from sclerotized bases; venter with a few sclerotized points, submesal sclerites pale and virtually indistinguishable, positions marked by concentrations of setae. Eighth tergum with a row of setae along posterior. Ninth tergum with sclerite stramineous, bearing many, long, dark setae along posterior, setae continuing as an irregular row laterad of sclerite; venter with 2 pairs of setae. Anal proleg with a single, long, black seta posteromesally on lateral plate, basal tuft of 3 long, black setae; membranous ventral portion without setae.

CASE.—Very variable: larval case usually of plant matter, more rarely of mineral particles; pupal case of mineral matter almost exclusively, transitional cases common. Larval case often very regularly formed of plant matter, evenly tapered and slightly curved. These cases may have large equivalently shaped mineral particles substituted; earlier stage cases often very irregular with projecting pieces of wood and leaf, a few cases even appearing triangular in cross-section, and made of leaf fragments. Pupal case straight and not tapered, exterior surface irregular, of mineral particles.

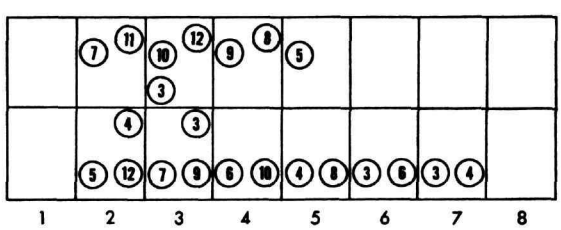

FIGURE 3.—Gill diagram, *Austrocosmoecus hirsutus* Schmid.

MATERIAL.—*Argentina*, Provincia Neuquen, brooklet at Lago Huechulafquen, 26 Jan 1974, O.S. Flint, Jr., 4♂ pupae, 6 larvae; 7 km northwest Lago Lolog, 23 Jan 1974, O.S. Flint, Jr., 8 pupae, 1 prepupa, 30 larvae; 5 km northwest Lago Lolog, 22 Jan 1974, O.S. Flint, Jr., 2 pupae, 1 prepupa, 1 larva; 2 km southeast Lago Lolog, 22 Jan 1974, O.S. Flint, Jr., 1 larva; Arroyo Rosales, north San Martin de los Andes, 22 Jan 1974, O.S. Flint, Jr., 6 pupae; 13 km east Quila Quina, 27 Jan 1974, O.S. Flint, Jr., 1 pupa, 2 larvae; Cerro Chapelco, 1400 m, east San Martin de los Andes, 24 Jan 1974, O.S. Flint, Jr., 25♂ and ♀ pupae, 50 larvae; Brooklet at Lago Meliquina, 25 Jan 1974, O.S. Flint, Jr., 4♂ pupae. Provincia Rio Negro, 8 km north Rio Villegas, 7 Feb 1974, O.S. Flint, Jr., 4♂ pupae, 2 prepupae, 3 larvae; same, but 11 Feb 1974, 5 larvae.

Chile, Provincia Curico, Rio Maitenes, 15 Feb 1965, G. Sanhueza, 25♂ and ♀ pupae and prepupae. Provincia Talca, Alto Vilches, 29–31 Oct 1969, O.S. Flint, Jr., 15 larvae. Provincia Nuble, Las Trancas, 2 Mar 1968, Flint and Pena, 25♂ and ♀ pupae and prepupae, 50 larvae; El Purgatorio, 3 Mar 1968, Flint and Pena, ♂ and ♀ adults reared, ♂ and ♀ pupae and prepupae, 50 larvae. Provincia Biobio, Santa Barbara, tributary of Rio Biobio, 6–8 Dec 1972, Pescador and Pena, 1 larva. Provincia Arauco, San Alfonso, above Caramavida, 16–17 Oct 1969, Flint and Barria, 25 larvae. Provincia Malleco, Parque Nacional Nahuelbuta, Estacion Cabreria, 750′ (228 m), 20 Mar 1966, T. Cekalovic, 1 larva; Nahuelbuta Mountains, source spring of small *Nothofagus* forest stream, Jan 1958, W.J. Eyendam, 4 pupae. Provincia Llanquihue, Lago Todos los Santos, brook near Puella, 6–10 Dec 1957, J. Illies, 1 larva. Provincia Aisen, Fiordo Tempano, 22 Sep 1969, O.S. Flint, Jr., 1 larva. Provincia Magellanes, Fiordo Peel, Caleta Amalia, 1 Oct 1969, O.S. Flint, Jr., 6 prepupae; Peninsula Cordova, Bahia Borja, 7 Oct 1969, O.S. Flint, Jr., 2 prepupae.

HABITAT.—The immature stages are easily found in small (usually less than a meter wide by half a decimeter deep), clear, cool, rapidly flowing brooks, usually in the *Nothofagus* forests. The lar-

vae are found in accumulations of organic trash or crawling over the bottom. The pupae are found attached to the undersides of large stones and sticks in pools and riffles, often in large clusters.

Genus *Magellomyia* Banks

This is the largest South American genus of the family, with 16 species that I recognize. The adults are quite diverse in appearance, as are the larvae, and the genus may be divided some day. Unfortunately most of the larval material in my possession is not associated with the respective adults. I have definite associations based on metamorphotypes for *M. appendiculata* (Ulmer), *M. capillata* (Ulmer), *M. porteri* (Navas), and another species of *Magellomyia* (probably *M. stenoptera* Schmid). The composite range for the genus runs from the Falkland Islands north throughout patagonian Argentina and Chile at least as far as Coquimbo.

The type-species is *M. moesta* Banks, a synonym of *M. appendiculata* (Ulmer), the larvae of which are here described in detail (Figures 36–45). For the sake of comparison I also present figures (46–49) of the larva of a species of *Magellomyia* (probably *M. stenoptera*), because the species is quite different from *M. appendiculata*, as is *M. porteri*, described earlier (Flint, 1968). The characters used below for generic recognition are based on these species and other unassociated larvae in our collection.

RECOGNITION.—In coloration the sclerites are either nearly unmarked or often with a distinct pattern of light and dark regions on the head. The mandibles are toothed apically. The tibiae of the mid- and hind legs generally have minutely serrated inner margins, or, rarely, smooth inner margins. The metanotum may have setae between the plates of sa 2, but in other species this area is without setae. The first abdominal segment is not particularly hairy, and the sternum may or may not have a conspicuous pair of multisetate sclerites submesally. The number of chloride epithelia is reduced, being present on segments 3–7, and that on segment 3 is often smaller; also, the rings themselves are only 3–4 times wider than long. All species have setae ventrally on the anal prolegs; these are often bladelike and borne from a pair of perianal sclerites.

Magellomyia appendiculata (Ulmer)

FIGURES 4, 36–45

Stenophylax appendiculatus Ulmer, 1904:19–21.
Magellomyia appendiculata.—Schmid, 1964:323.—Flint, 1967:57; 1974 [1975]:88.
Limnophilus patagonicus Ulmer, 1904:9–10 [new synonymy].
Limnophilus setipes Ulmer, 1904:10–11 [new synonymy].

This species is the most widespread of the genus; it has been collected from the Falkland Islands, Isla de los Estados, Tierra del Fuego, and the mainland almost as far north as Santiago, Chile. The larvae of the genus seem to divide into two well-marked groups: one is typified by *M. appendiculata*, the other by what is probably *Magellomyia stenoptera*. In the latter group the head has a strongly contrasting color pattern, the metanotum lacks setae on the membrane, the first abdominal venter has a distinct pair of sclerites submesally, and the anal prolegs have many bladelike setae, those of the ventral portion mostly clustered on a pair of parenthesis-like perianal sclerites. *M. appendiculata* and *M. capillata*, in contrast, have a rather uniformly colored head, the metanotum has setae scattered on the membrane, the first abdominal sternum lacks submesal plates, and there are very few bladelike setae on the anal prolegs and the ventral portion lacks both the setae and the perianal sclerites.

I have been able to study the types (larvae) of *Limnephilus patagonicus* Ulmer and *L. setipes* Ulmer, and find that these all represent a single species—i.e., *M. appendiculata*, the most common species in the area where all three originated.

LARVA.—Length to 15 mm, width to 2.5 mm. Sclerites of head dark reddish-brown, those of thorax paler, yellowish; muscle scars with dark rims. Anterior half of frontoclypeus smooth, rest of head and thoracic nota with small asperites.

Head hypognathous; lacking ridges; with a few secondary setae on genae and frontoclypeus posteriad to anterior margin of eyes. Labrum with anterolateral brush small. Mandibles with large mesal brushes; both with 5 apical teeth. Maxilla with galeal brush small, with mesal area enlarged. Labium with inner surface not enlarged; submental seta arising from a small basal sclerite. Gula with apex narrowly elongate, filling almost ¾ of ventral ecdysal line.

Pronotum with anterior margin fringed with pale setae, both short and long, and more erect, darker setae; transverse depression shallow. Mesonotum with plates well developed, with setae scattered over entire surface. Metanotal plates sa 1, sa 2, and sa 3 pale and poorly delineated, entire membranous surface with scattered setae. Prosternal horn subequal in length to forecoxae; plate very indistinct. Meso- and metasterna unornamented. Foreleg with trochanteral brush well developed, with 2 large, pale setae; femur with ventral margin bearing 2 major, pale setae and a comb of short, pale, setae; tibia with a pair of apicoventral spurs; tarsus with a few small points ventrally, apical spur very small; claw with basal seta about ¼ the length of the claw, which is gently curved. Mid- and hind legs essentially identical as follows: trochanteral brush small, with a single, pale bladelike seta; femur with about 5 large, pale, setae on ventral margin, and a comb of short, pale setae; tibia with inner margin minutely serrate, with a pair of large apical spurs; tarsus with inner margin minutely serrated, apical spurs small; claw with basal setae about ¼ the length of the claw, which is gently curved.

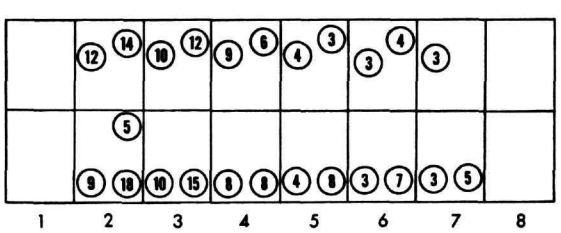

FIGURE 4.—Gill diagram, *Magellomyia appendiculata* (Ulmer).

Abdomen with gills as in Figure 4. Lateral line well developed, from anterior of segment 3 through segment 8. Bifid processes on segments 3–7, 3–5 processes on each segment. Chloride epithelia in form of ovoid rings ventrally on segments 3–7, that of segment 3 often less than half size of others. First segment with dorsal and lateral humps well developed, ventrally with a broad hump, but low; with scattered setae anteriad and laterad to dorsal hump, above lateral hump and across venter, largest setae arising from sclerotized bases. Eighth tergum with a row of long setae along posterior margin. Ninth segment with tergite brownish, with long and short setae, membrane with a few scattered setae dorsolaterally, venter with 2 pairs of short setae. Anal proleg with numerous setae on lateral plate (several of the mesal setae are bladelike), basal tuft of 3 long setae; membrane ventrally with a number of long and short hairlike setae.

CASE.—Made of small pieces of plant matter and/or mineral particles. Pieces regularly and evenly placed at maturity, more irregularly placed in earlier stages. Cylindrical in cross-section; very slightly tapered and curved posteriad, cylindrical in pupal cases. Posterior opening narrowed by silk and plant or sand particles to a narrow, cylindrical opening.

MATERIAL.—*Chile*, Provincia Magallanes, Agua Fresca, near Punta Arenas, 20 Sep 1970, M. Cerda, 7 larvae; Rio Tres Brazos, near Punta Arenas, 9–13 Jan 1966, Flint and Cekalovic, 3♂ and 3♀ metamorphotypes, 38 pupae, 1 larva; Peninsula Brunswick, Bahia Fortescue, 6 Oct 1969, O.S. Flint, Jr., 1♀ metamorphotype, 1 pupa, 14 larvae. Provincia Chiloe, Dalcahue, temporary pool, 21–23 Oct 1969, Flint and Barria, 1♂ metamorphotype, 7 pupae, 2 prepupae. *Argentina*, Isla de los Estados, Bahia York, Puerto Celular, 4–6 May 1971, Flint and Hevel, 1♂ metamorphotype, 100 larvae; Isla de los Estados, Primeria Bahia, 8 May 1971, Flint and Hevel, 1♂ metamorphotype, 2 larvae.

HABITAT.—Larvae of this species are ecologically tolerant. I have taken them in a variety of situations, from small flowing streams (usually

the backwaters) to small ponds and pools, marshes, and temporary pools holding water only in the winter rainy season (Flint, 1971). The cases are rather inconspicuous and easily overlooked in accumulations of organic trash. Pupae are attached to the underside of sticks and stones, in crevices in organic objects, or secreted in the roots of rushes or other aquatic plants.

Genus *Metacosmoecus* Schmid

This monotypic genus is known only from central Chile, though it undoubtedly occurs in adjacent Argentina. The species seems to be rather local and rarely abundant.

RECOGNITION.—The larvae are generally quite similar to those of *Magellomyia*, but more hairy. Their mandibles are toothed apically. The head and thorax are yellowish- to reddish-brown, with many dark-rimmed muscle scars. The metanotum has setae on the membrane posteriorly. The tibiae and tarsi of all legs only possess the apical spurs. Chloride epithelia are present on abdominal sterna 2–7, and each ring is very broad and short, about 8 times broader than long. The anal prolegs possess many long, hairlike setae, including some on the venter. These setae are not bladelike, nor are the ventral ones borne on perianal sclerites, as they are in *Magellomyia*.

Metacosmoecus nigrofasciatus Schmid

FIGURES 5, 50–59

Metacosmoecus nigrofasciatus Schmid, 1955:39–40; 1957:387–388.—Flint, 1967:57; 1974 [1975]:89.

The larvae of this species are associated by a single male metamorphotype, whose sclerites definitely associate it with a series of larvae taken at the same site in another year. The larvae have not been described before.

LARVA.—Length to 18 mm, width 4 mm. Sclerites of head and thorax light yellowish- to darker reddish-brown, muscle scars have pale centers surrounded by darkened cuticle.

Surface of head, and especially thoracic nota covered by very small asperites. Head regularly rounded, lacking ridges and secondary setae. Labrum with anterior margin narrowly membranous; anterolateral brushes small. Mandibles with large mesal brushes; right with 5, left with 4 apical teeth. Maxilla with galea cylindrical, brush very small; palpus longer than galea. Labium with area between ventral rods covered with minute dark points; submental setae arising from small sclerites, submentum lightly sclerotized, but with a pair of elongate sclerites basally. Gula elongate, extending about ⅘ the length of the ecdysal line.

Pronotum heavily setate; anterior margin with a fringe of fine, pale setae, a row of enlarged, bladelike, pale setae, and a row of large, dark setae; with a shallow, transverse depression at anterior third. Mesonotum with plates well developed, with many setae, obscuring primary positions. Metanotum with sa 1, sa 2, and sa 3 represented by large sclerites each bearing many setae, with row of setae all along posterior margin. Prosternal horn not attaining apices of forecoxae; plate indistinct. Mesosternum with an irregular double row of small sclerites posterolaterally; metasternum unornamented. Foreleg with trochanteral brush well developed, with 2, short, pale, bladelike setae; with 2 major femoral setae, short and pale, with a fringe of fine hairs extending from base nearly to second seta, and row of short, pale setae along entire margin; tibial spur short, broad, and pale; basal seta of claw about ¼ length of claw. Midleg with trochanteral brush reduced to a few hairs and 1 pale, bladelike seta; femur with 6–8 major setae ventrally; tibial spurs short, pale, and bladelike; basal seta of tarsal claw about ¼ length of claw. Hind leg lacking trochanteral brush, with 1 pale, bladelike seta; femur with 8–10 major setae on ventral margin; tibial spurs short, pale, bladelike; basal seta of tarsal claw about ¼ length of claw.

Abdomen with gills as in Figure 5; posteromost one or two of any series may be lacking. Lateral line from segment 3 to posterior of 7, hair very short, pale, and inconspicuous. Bifid processes small and often lost, but 3–4 generally present on

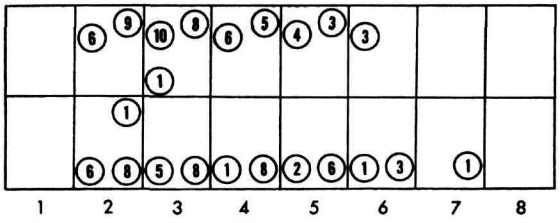

FIGURE 5.—Gill diagram, *Metacosmoecus nigrofaciatus* Schmid.

each of segments 4–7. Chloride epithelia present on venters of segments 2–7, very broad and narrow, about 8 times broader than long. First segment generally with humps rather broad and depressed; generally very hairy in all positions; lacking sclerites. Eighth tergum with a single row of setae posteriorly. Ninth tergite pale, bearing many long, black setae, which continue as an irregular row laterally on segment; venter with 2 pairs of setae. Anal proleg with many black setae on lateral plate, most elongate and normal; basal tuft of 3–4 long, black setae; ventral membranous area with 6–8 scattered, black setae, lacking sclerites.

CASE.—Constructed of mineral matter. Circular in cross-section, surface very evenly, uniformly, and firmly formed of small grains. Slightly curved and tapered. Posterior with a large central opening, circular or irregular in outline, surrounded by silk and sand grains.

MATERIAL.—*Chile*, Provincia Malleco, Parque Nacional Contulmo, 19 Oct 1969, Flint and Barria, 50 larvae; same, but 2 Jan 1966, Flint and Cekalovic, 1♂ metamorphotype. Provincia Talca, Alto Vilches, 29–31 Oct 1968, O.S. Flint, Jr., 5 larvae. Provincia Nuble, Recinto, 14 Oct 1969, Flint and Barria, 11 larvae.

HABITAT.—The larvae appear to burrow in the sand of small streams that are only a fraction of a meter in width by less than a decimeter deep. They have been found by carefully washing away the sand to a depth of a few centimeters, revealing the cases in the resulting depression. One collection was made in a rather different situation. The larvae were found on a vertical rock surface over which a small stream was falling into a small pool, in which the single male metamorphotype was found attached to the underside of a stone. The larvae were found beneath the moss on the rocks of the fall, usually in small pockets of sand and silt. Both habitats seem to allow the larvae to burrow in a fine substrate, but it is unknown whether the waterfall or small stream habitat is favored.

Genus *Monocosmoecus* Ulmer

This genus, the second largest in South America, contains six species that I recognize. The adults of most species are quite large and many are distinctively marked. The species are widespread from the tip of Tierra del Fuego north throughout patagonian Argentina and Chile at least as far as the province of Coquimbo.

I have metamorphotypes for all but one of the species: *M. vanderweeli* Ulmer, *M. pulcher* Ulmer, *M. hyadesi* (Mabille), *M. minor* Schmid, and *M. obtusus* Schmid. (Metamorphotypes of *M. aberrans* Flint are unknown to me.) The larvae of all species are very similar in general appearance to those of the type-species, *M. vanderweeli*, here described.

RECOGNITION.—The sclerites of the head and thorax are basically dark, with a more or less well-marked pale band from the posterior of the frontoclypeus back through the pro- and mesonota. The mandibles are toothed apically. The inner, membranous surfaces of the maxillolabium are greatly enlarged and very hairy. The inner margin of the tibia and tarsus generally have a fringe of short setae (though it is lacking in some species) in addition to the apical spurs. The membranous area of the metanotum is without setae. The first abdominal sternum bears a distinct, submesal, pair of sclerites, each with many setae. The rings outlining the chloride epithelia are present and prominent on the venters of abdominal segments 3–7. The anal prolegs have only 1 extra seta on the lateral plates and none in the membranous ventral region.

Monocosmoecus vanderweeli Ulmer

FIGURES 6, 60–68

Monocosmoecus vanderweeli Ulmer, 1906:13–16.—Schmid, 1964:326.—Flint, 1974 [1975]:89.

Nolga truncata Navas, 1929:333–334.—Schmid, 1949a:409–411; 1964:326.

Nolga calceata Navas, 1930:364–365.—Schmid, 1955:64.

The species is quite widespread, although not the most frequently encountered of the genus. The known range extends from Chubut in southern Argentina to Curico in central Chile. The larvae of this species have not been described before, but larvae of *M. obtusus* (Flint, 1967:58–60) and *M. hyadesi* (Ulmer, 1904:17–19 as *Stenophylax branchiatus*) are described in the literature.

LARVA.—Length to 21 mm, width to 4.5 mm. Sclerites of head and thorax reddish-brown, muscle scars of head pale, with a pale central stripe from apex of frontoclypeus through metanotum. Frontoclypeus smooth, genae posterior to eyes, and pro- and mesonota with small asperites.

Head hypognathous; lacking ridges and accessory setae. Labrum with anterolateral brush small. Mandibles with mesal brushes large; both with 4 apical teeth. Maxilla with galeal brush well developed; palpus barely longer than galea. Labium with area between ventral rods with an elongate patch of dark asperites; inner surface greatly enlarged and with a large brush; submental seta arising from anterolateral angle of a large, elongate sclerite. Gula with apex narrowly elongate, filling ¾ of ventral ecdysal line.

Pronotum with anterior margin fringed by mostly short, pale, thin setae, with a row of erect dark setae; transverse depression deep, posterior margin nearly vertical. Mesonotum with plates well developed, setal areas well delimited. Metanotum with sa 1, sa 2, and sa 3 represented by well-marked plates bearing a number of setae; membrane without setae, with muscle attachments found in membranous area. Prosternal horn shorter than forecoxa; plate well sclerotized, pentagonal, with 2 small sclerotized points to each side. Mesosternum with an irregular double row of small sclerotized points along posterior. Foreleg with trochanteral brush well developed, bearing 2 broad, pale setae; femur with ventral margin bearing 5 major, pale setae, a comb of short, pale setae, and a brush of pale hairs on basal third; tibia with a comb of short, pale setae on inner margin, apex with a pair of large, pale spurs; tarsus with inner margin serrate, apical spur small; claw with basal seta about ¼ the length of the claw, which is gently curved. Mid- and hind legs essentially identical as follows: trochanteral brush small, with a single, pale, bladelike seta; femur with 8 pale and 5 dark, bladelike setae along ventral margin, and a comb of very short, pale setae for most of length; tibia and tarsus with a comb of short, pale setae on inner margin, tibial spurs large, pale, bladelike; basal seta of claw about ¼ the length of the claw, which is gently curved.

Abdomen with gills as in Figure 6. Lateral line well developed, from posterior of segment 2 to posterior of segment 8. Bifid processes present on segments 3–8, with 6–10 processes per segment. Chloride epithelia contained in oval, sclerotized, transverse rings ventrally on segments 3–7. First segment with humps well developed, venter with a broad transverse ridge; with setae prominent, most arising from distinct, sclerotized bases; with a small sclerite just above and another just below, lateral hump, each with several setae; submesal sclerites prominent, each bearing many setae, with scattered setae on membrane ventrally. Eighth tergum with a row of long setae on posterior. Ninth tergum with sclerite brownish, bearing long setae posteriorly, with an irregular row of setae dorsolaterally on membrane; venter with 2 pairs of setae arising from sclerotized bases. Anal proleg with a single, black seta posterome-

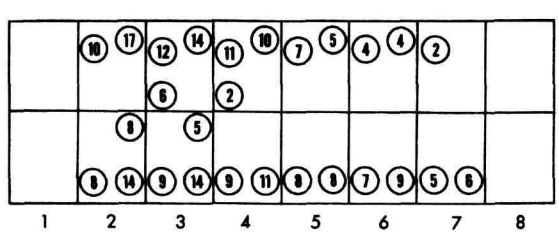

FIGURE 6.—Gill diagram, *Monocosmoecus vanderweeli* Ulmer.

sally on lateral plate, basal tuft of 3 long, black setae; membranous venter without setae.

CASE.—Made mostly of mineral matter, usually incorporating pieces of wood, especially posteriorly. Circular in cross-section, rather uniformly formed, only slightly tapered. Posterior end narrowed by a silken ring, with an ovoid central opening.

MATERIAL.—*Argentina*, Provincia Chubut, Arroyo Golondrinas, 6 km north Lago Puello, 8 Feb 1974, O.S. Flint, Jr., ♂ and ♀ metamorphotypes, larvae, and pupae.

HABITAT.—The one collection with metamorphotypes that was made of this species came from a small stream, 1–3 meters wide by 2–3 decimeters deep. The water was clear, cool, and rapidly flowing. It was an artificial watercourse, actually a trailrace from a water powered sawmill. As such it contained many small scraps of wood and pieces of large sawdust. The larvae were very abundant in organic debris and the pupae were found attached to the undersides of large pieces of wood and stones.

Other species are found in very small mountain streams (*M. minor* and *M. obtusus*) to large, clear rivers and wave-washed lake shores (*M. pulcher*).

Genus *Platycosmoecus* Schmid

This is a monotypic genus known only from the Chilean subregion. Although not infrequently collected, only a few individuals have ever been taken at the same time.

RECOGNITION.—This genus is very easy to recognize, as it possesses a number of distinctive characteristics. The large, spikelike setae of the head, thorax, and first abdominal segment are unusual. The mandibles are toothed apically. The thoracic nota are smooth with only a few setae, and none on the metanotal membrane. The femur of the foreleg is very unusual in shape, and the tibiae and tarsi of all legs are strongly spined on their inner margins. The first abdominal segment virtually lacks spacing humps, but has 2 pairs of distinct sclerites dorsally, 1 pair laterally, and 2 pairs ventrally. The lateral line gills are lacking. The chloride epithelia is found only on segments 5–7, although segment 4 may have a small or even typical ring on some examples. The lateral plates of the anal proleg only have 1 or 2 extra setae, and the ventral membrane has none.

Platycosmoecus beaumonti (Schmid)

FIGURES 7, 69–77

Beaumontia beaumonti Schmid, 1958:206–208.
Platycosmoecus beaumonti.—Schmid, 1964:326–327.—Flint, 1974 [1975]:89.

This is a rather large and distinctive species, both in the adult and larval stages. It is known from the provinces of Nuble south to northern Magallanes in Chile and from adjacent Argentina. Several collections containing male or female metamorphotypes have been made.

LARVA.—Length to 22 mm, width to 4.5 mm. Sclerites of head and thorax yellowish-brown with 2 indistinctly darker, longitudinal bands from pronotum through metanotum; muscle scars pale, surrounded by slightly darkened cuticle. Surface of head with minute asperites, that of thoracic nota smooth.

Head distinctly elongate, almost prognathous, parallel-sided in dorsal aspect; lacking ridges and secondary setae; primary setae 2, 3, 5, 7, 9, 14, and 17 extremely long, dark, and enlarged. Labrum with small anterolateral brush, seta 1 indistinguishable. Mandibles with mesal brushes; right with 3, left with 4 apical teeth. Maxilla with galeal brush much reduced. Labium with area between ventral rods filled by a darkened rugose surface; submental setae arising from a linear sclerite extending mesad then basad, remainder covered by darkened scalelike points with a paler central region. Gula short, less than ½ the length of the ventral ecdysal line.

Pronotum with setae reduced in number and size, except for 4 enlarged, black setae at midlength and a row along anterior margin; anterior margin with a few thin, pale setae and few, pale, bladelike setae; transverse depression very shallow and broad. Mesonotum with plates well de-

veloped, each with setal areas well delimited and bearing 1 or 2 enlarged, black setae. Metanotum with sa 1, sa 2, and sa 3 represented by large, distinct sclerites, each with a few setae, 1 or 2 of which are distinctly enlarged; lacking setae on membrane. Prosternal horn slightly more than half length of forecoxa; plate well sclerotized, heart-shaped to trianguloid in outline. Mesosternum posterolaterally with 3 irregular rows of small sclerites; metasternum unornamented. Foreleg with 8–10 short, broad, pale setae along ventral margin of trochanter, brush well developed, but hairs short, basal sclerite with many, black setae; femur with ventral margin expanded for basal half, with inner surface bearing many setae in this area, apical half contracted, terete, ventral margin with 4–5 enlarged, pale, bladelike setae and a row of very short, pale setae and 1 long, darkened seta on basal half; tibia and tarsus with inner margin bearing a double row of pale, bladelike setae; basal seta of tarsal claw about ⅓ length of claw. Midleg with coxa very long; trochanter with 2 pale, bladelike setae ventrally, no brush; femur with 4 regularly spaced, black setae along ventral margin, with 10–12 smaller, pale, bladelike setae interspersed; tibia with 2 long setae and few small, pale setae on inner margin, 1 spur much longer than other; tarsus with 2 long setae on inner margin; basal seta of tarsal claw about ⅓ length of claw. Hind leg with trochanter ventrally bearing a row of black setae and of pale, bladelike setae apically, no brush; femur with ventral margin bearing a row of 12–14 pale, bladelike setae and 6–7 darkened setae; tibia with 2 elongate setae and a row of very short, pale setae on inner margin, apical spurs pale, short; tarsus with 2 pale, bladelike setae and a row of very short, pale setae on inner margin; basal seta of tarsal claw about ⅓ length of claw.

Abdomen with gills as in Figure 7; lateral line gills lacking. Lateral line well developed, from middle of segment 3 to apex of segment 8. Bifid processes apparently lacking. Chloride epithelia of small size on venter of segments 5–7, sometimes a minute to typical ring on 4. First segment with humps very small, essentially lacking; dorsally

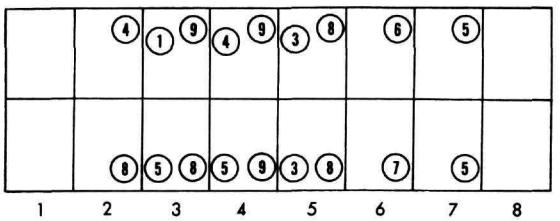

FIGURE 7.—Gill diagram, *Platycosmoecus beaumonti* (Schmid).

with 2 pairs of distinct sclerites each bearing 3–6 setae, a sclerite above region of lateral hump, bearing 5–6 setae; ventrally with 2 pairs of sclerites, 1 ventrolaterally other submesally, each with 1 large seta, a few scattered, short setae on anterior half. Eighth tergum posteriorly with 6–8 pairs of setae, mostly very small. Ninth tergum with sclerite distinct, with setae along posterior margin, with 2–3, mostly small, setae laterad; ventrally with 1 pair of large and 1 pair of minute setae. Anal proleg with a single (or rarely 2) seta on lateral plate dorsally, basal tuft of 3 setae; no setae on membrane ventrally.

CASE.—Constructed of plant matter. Circular in cross-section, pieces either placed longitudinally or transversely with their ends extending freely. Pieces of aquatic moss often used, in which situation the exterior is very "fuzzy." Case straight or slightly curved, slightly tapered posteriad. Posterior without apparent closure.

MATERIAL.—*Argentina*, Provincia Neuquen, brooklet at Lago Huechulafquen, 26 Jan 1974, O.S. Flint, Jr., 1♂ metamorphotype. Provincia Rio Negro, 6 km north Rio Villegas, 7 Feb 1974, O.S. Flint, Jr., 2♀ metamorphotypes. *Chile*, Provincia Arauco, Caramavida, 17–19 Oct 1969, Flint and Barria, 2 larvae. Provincia Chiloe, Dalcahue, 21–23 Oct 1969, Flint and Barria, 25 larvae. Provincia Magallanes, Puerto Bueno (51°00′S, 74°12′W), 2 Oct 1969, O.S. Flint, Jr., 2 larvae.

HABITAT.—The immature stages of this species are found in small (generally less than 1 m wide) brooks. These are fast-flowing and often cascading down hillsides, but do have small pools below the cascades. They have a growth of plants in the water, often moss on the rocks, or rarely rooted plants. The streams are generally within *Nothofagus* forests.

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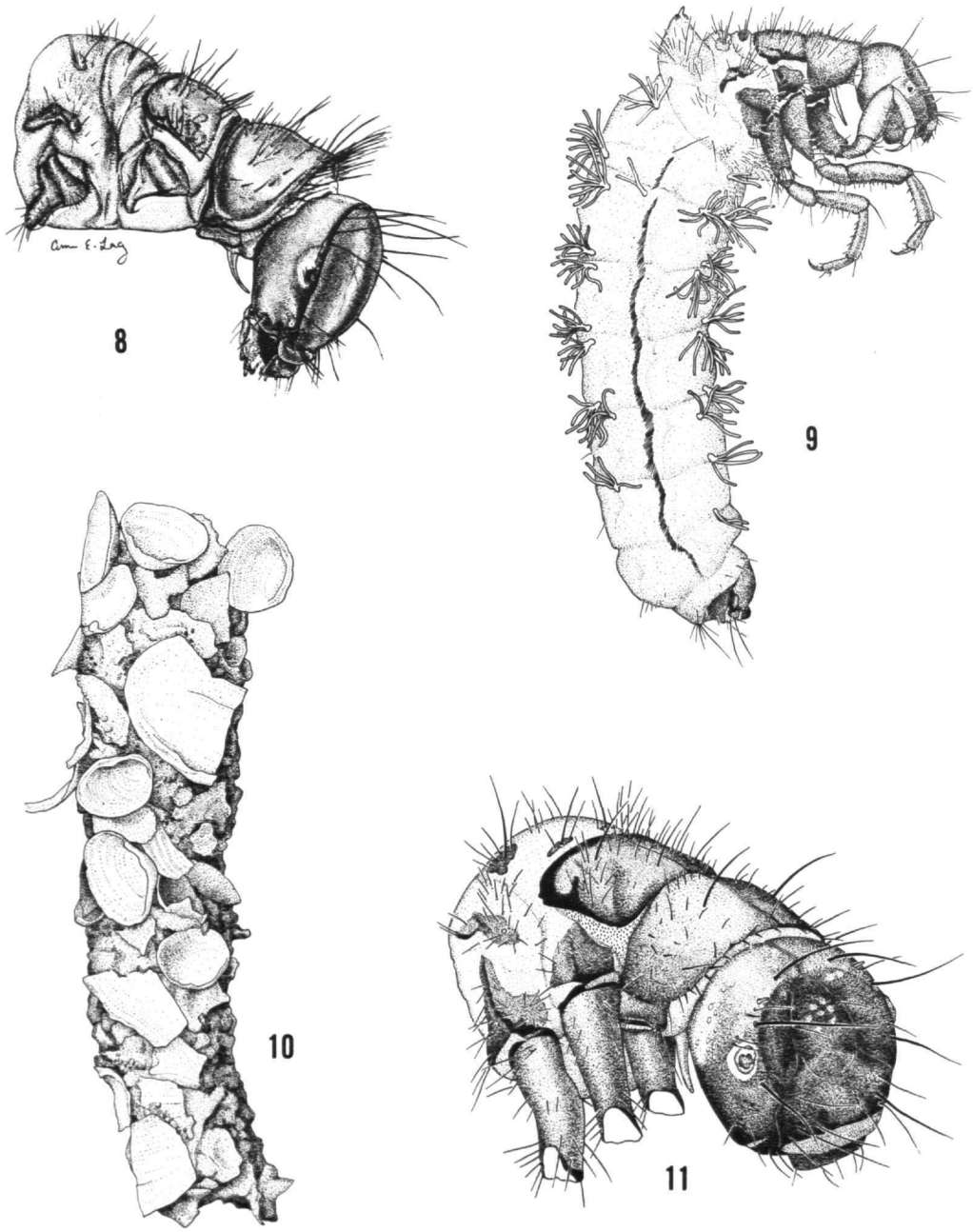
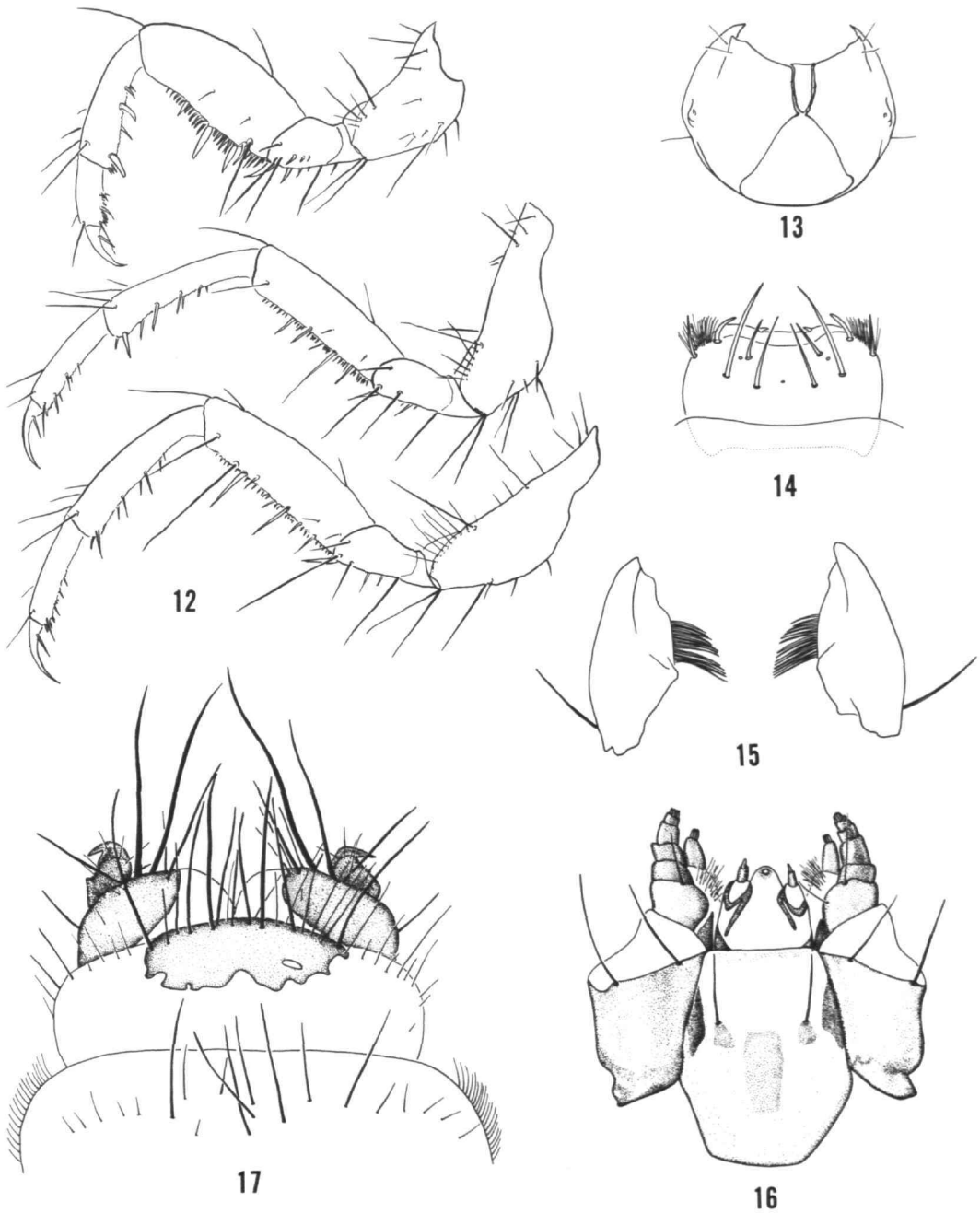
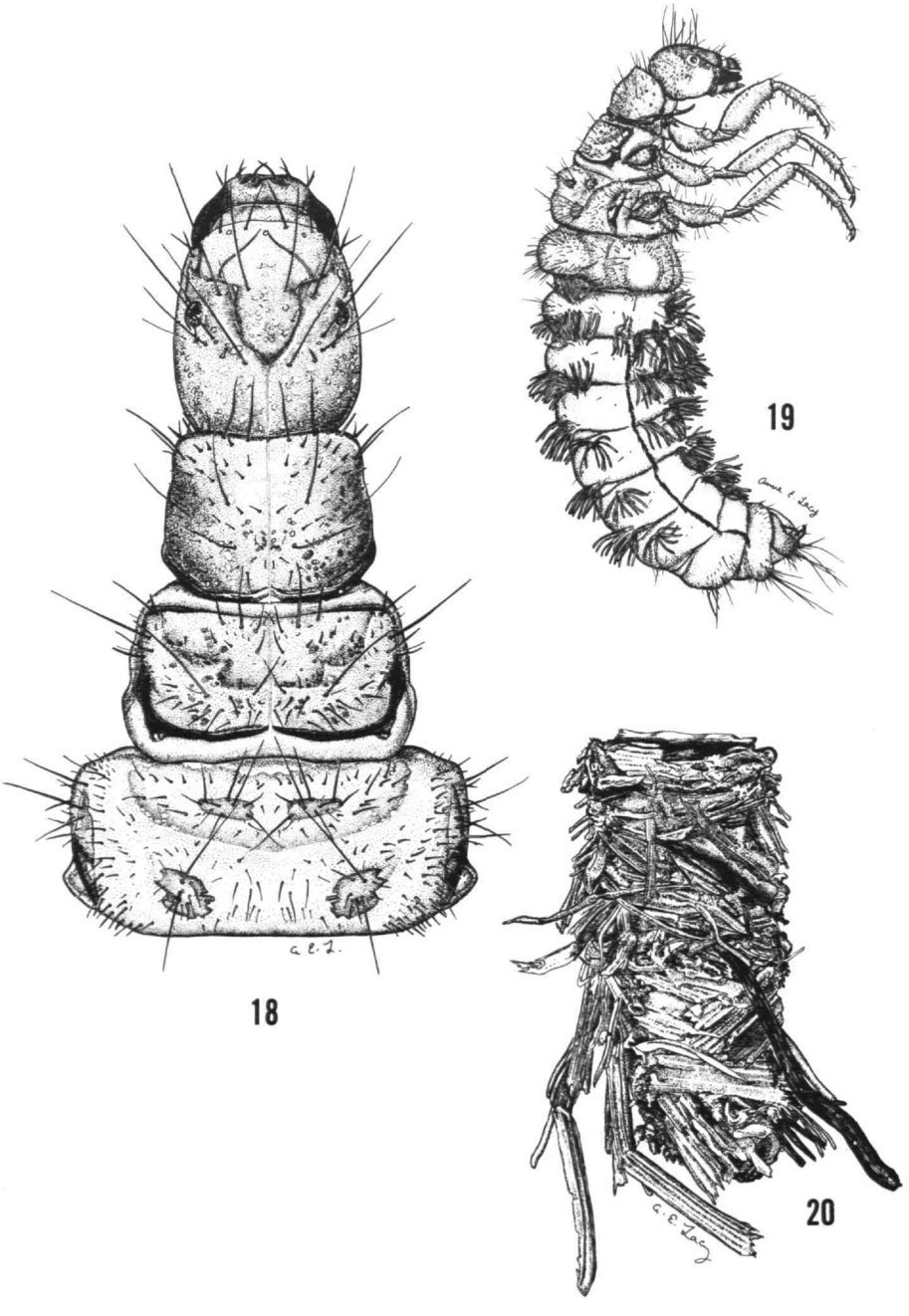


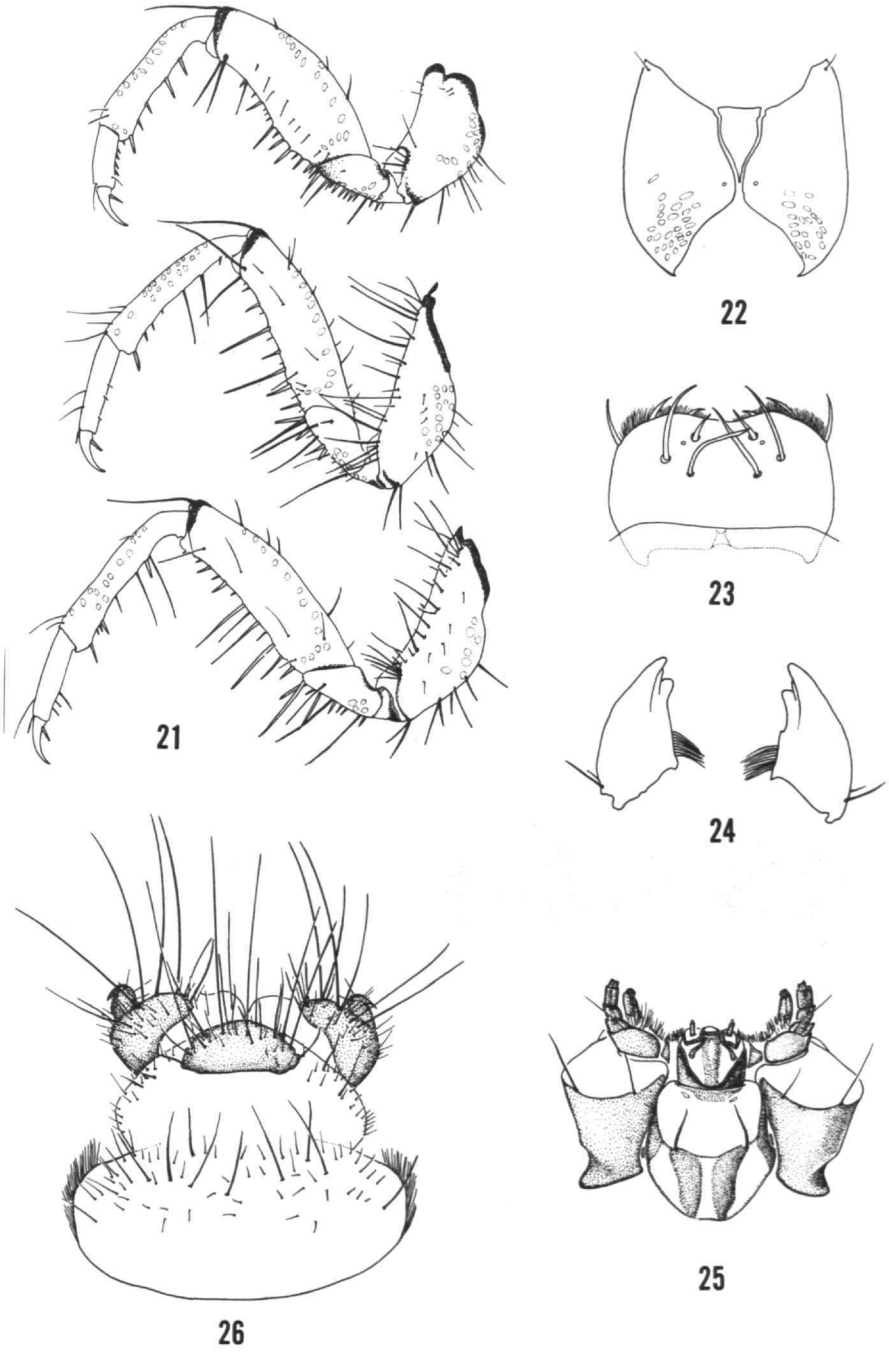
FIGURES 8–11.—*Anomalocosmoecus illiesi* (Marlier): 8, head and thorax, legs removed, oblique view. *A. blancasi* Schmid: 9, larva, lateral; 10, case, lateral; 11, head and thorax, legs removed beyond coxae, oblique view.



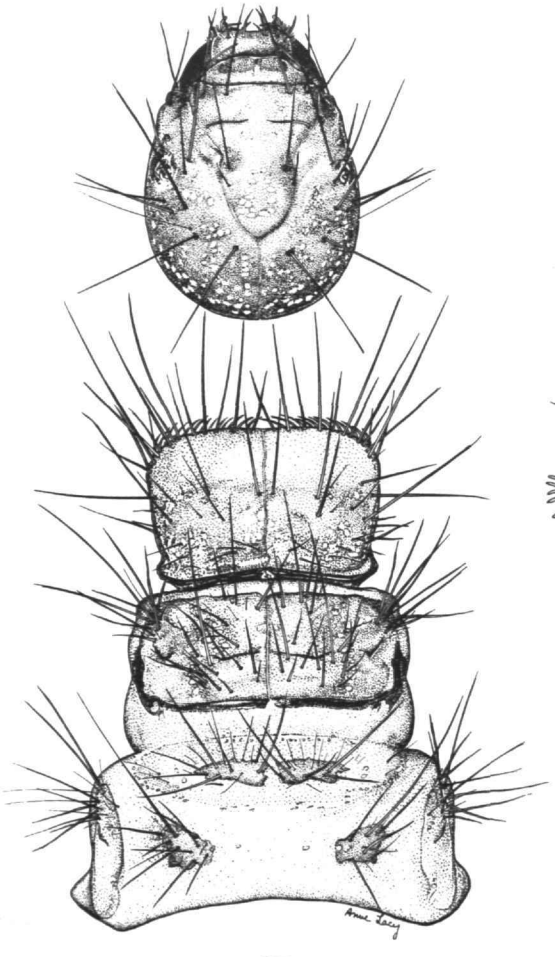
FIGURES 12–17.—*Anomalocosmoecus blancasi* Schmid: 12, fore-, mid-, and hind legs, lateral; 13, head, ventral; 14, labrum, dorsal; 15, mandibles, dorsal; 16, maxillolabium, ventral; 17, apex of abdomen, dorsal.



FIGURES 18–20.—*?Antarctoecia nordenskioeldi* Ulmer: 18, head and thorax, dorsal; 19, larva, lateral; 20, case, lateral.



FIGURES 21–26.—?*Antarctoecia nordenskioeldi* Ulmer: 21, fore-, mid-, and hind legs, lateral; 22, head, ventral; 23, labrum, dorsal; 24, mandibles, dorsal; 25, maxillolabium, ventral; 26, apex of abdomen, dorsal.



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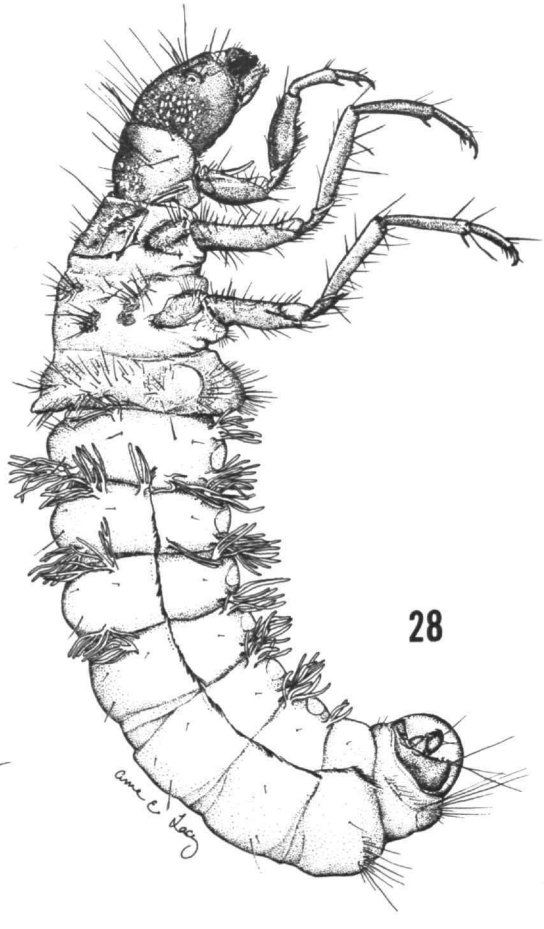

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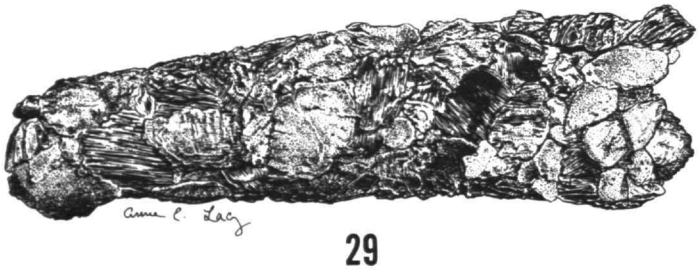

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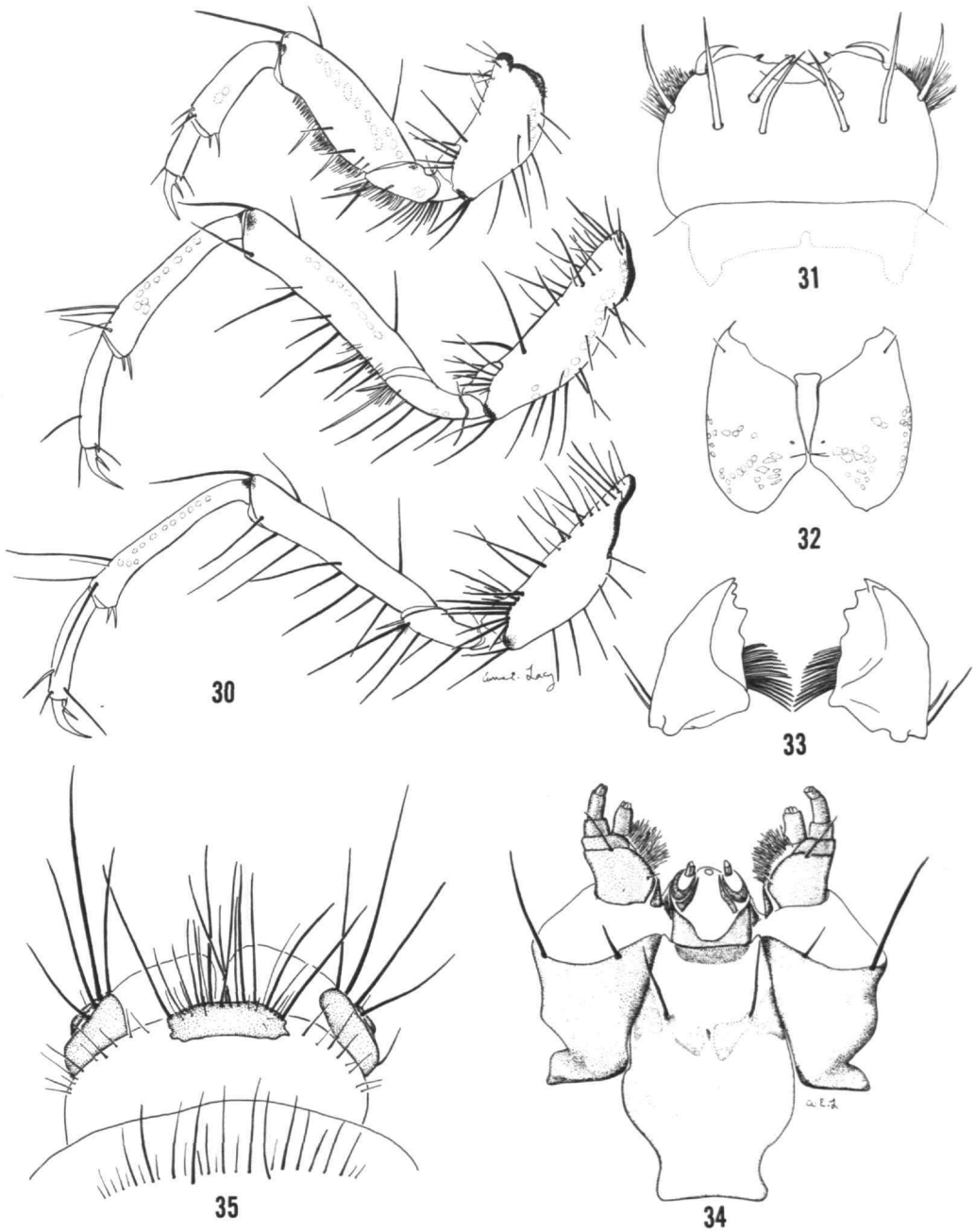
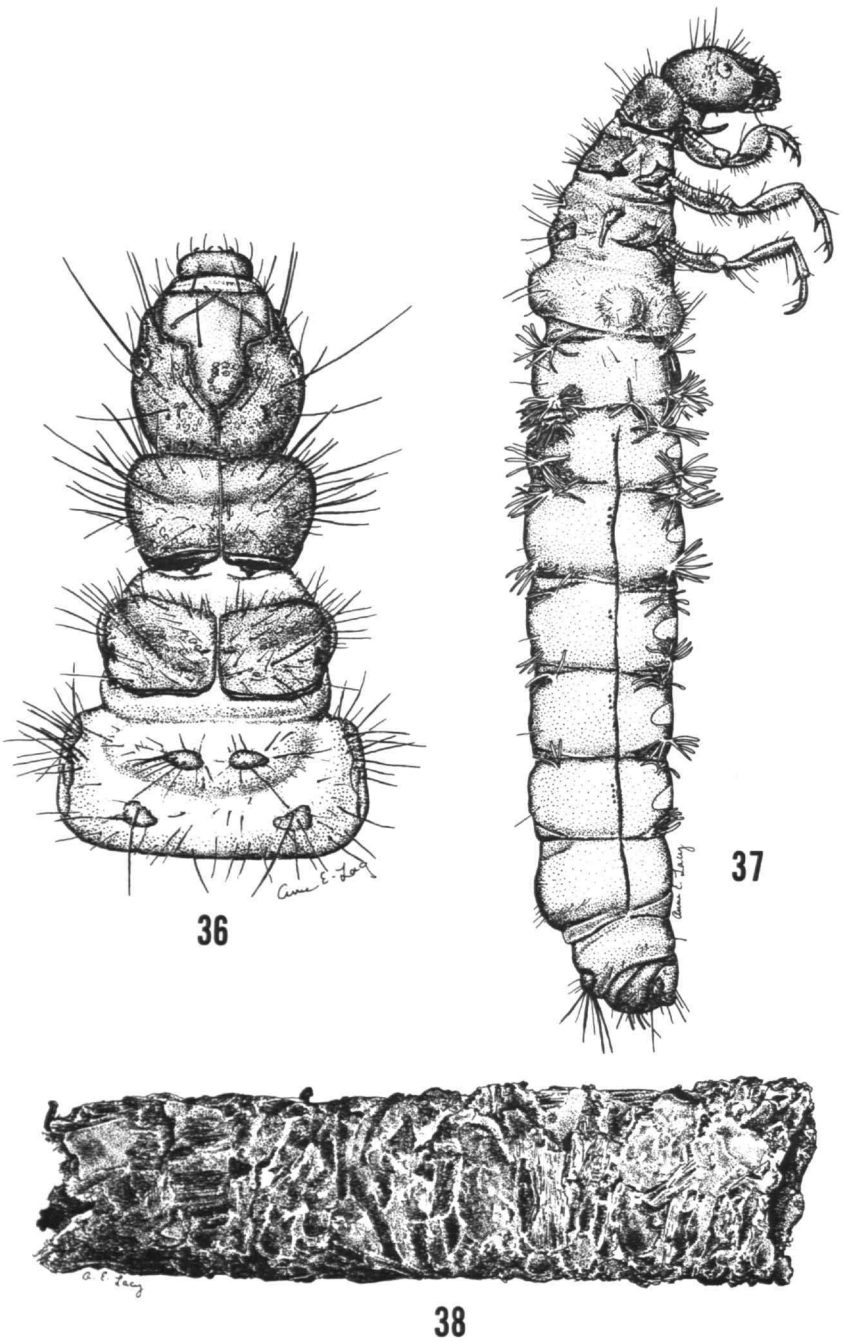
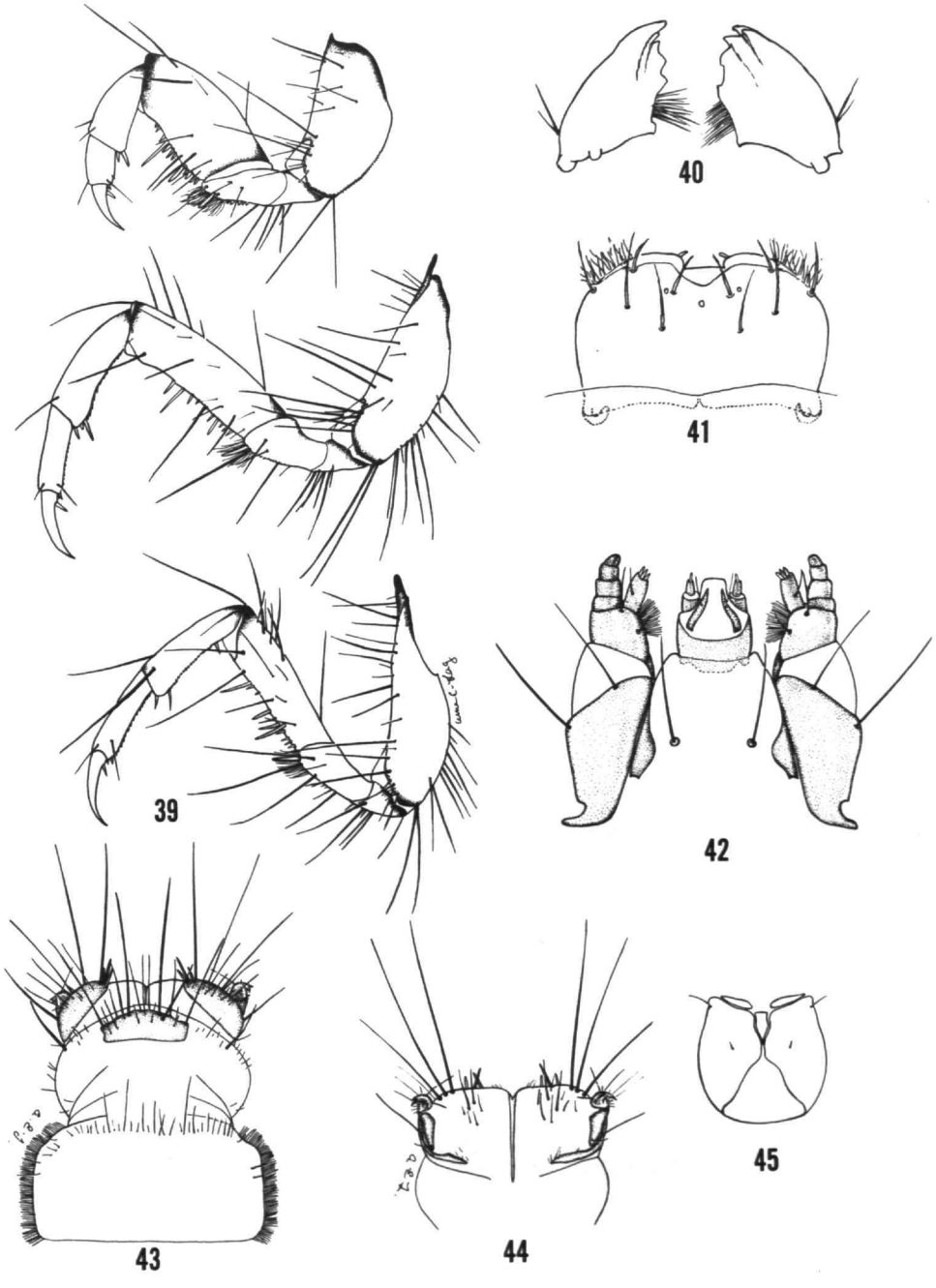
FIGURES 27–29.—*Austrocosmoecus hirsutus* Schmid: 27, head and thorax, dorsal; 28, larva, lateral; 29, case, lateral.



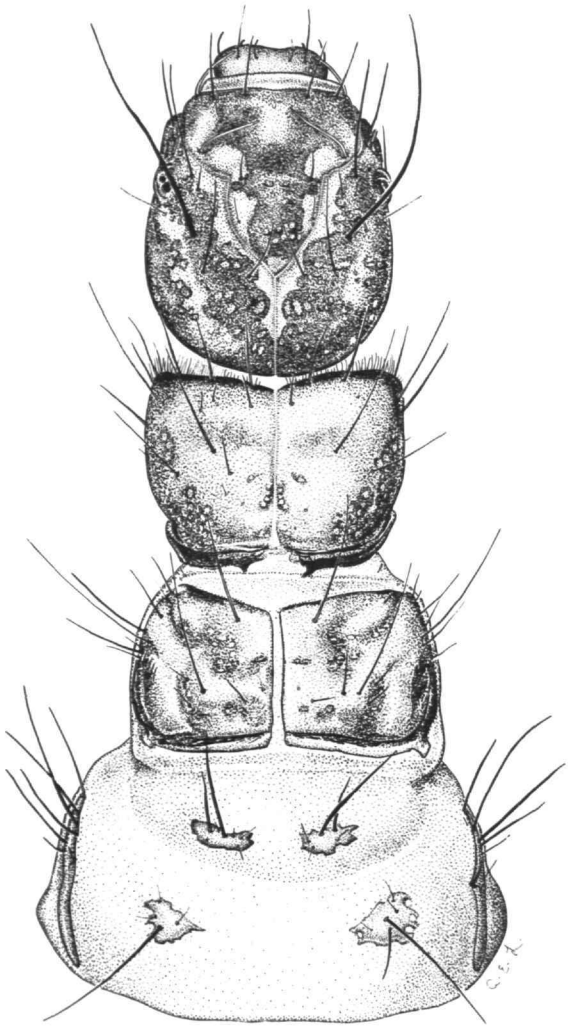
FIGURES 30–35.—*Austrocosmoecus hirsutus* Schmid: 30, fore-, mid-, and hind legs, lateral; 31, labrum, dorsal; 32, head, ventral; 33, mandibles, dorsal; 34, maxillolabium, ventral; 35, apex of abdomen, dorsal.



FIGURES 36-38.—*Magellomyia appendiculata* (Ulmer): 36, head and thorax, dorsal; 37, larva, lateral; 38, case, lateral.



FIGURES 39-45.—*Magellomyia appendiculata* (Ulmer): 39, fore-, mid-, and hind legs, lateral; 40, mandibles, dorsal; 41, labrum, dorsal; 42, maxillolabium, ventral; 43, apex of abdomen, dorsal; 44, anal prolegs, ventral; 45, head, ventral.



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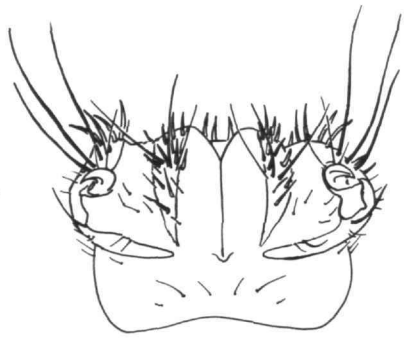

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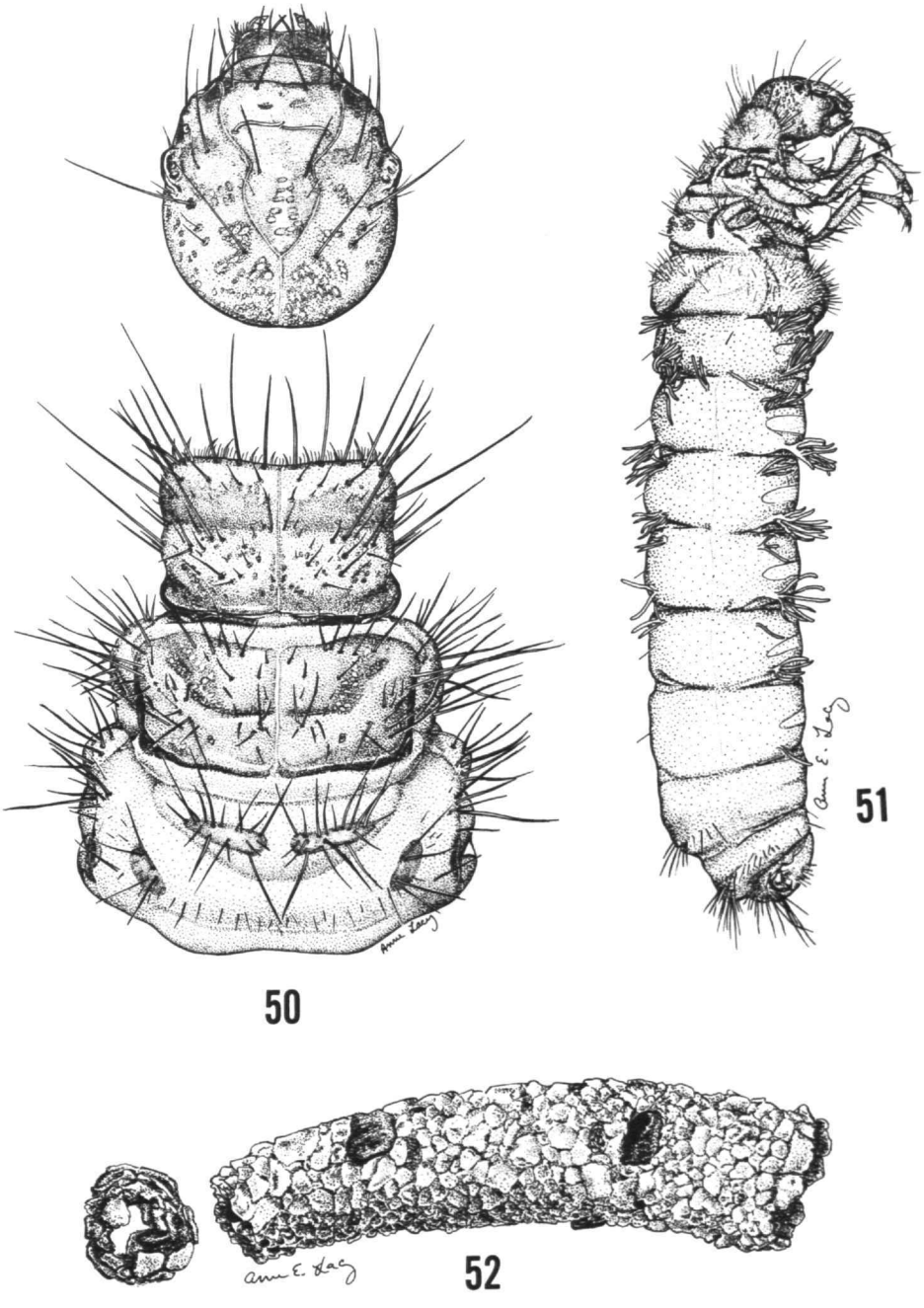
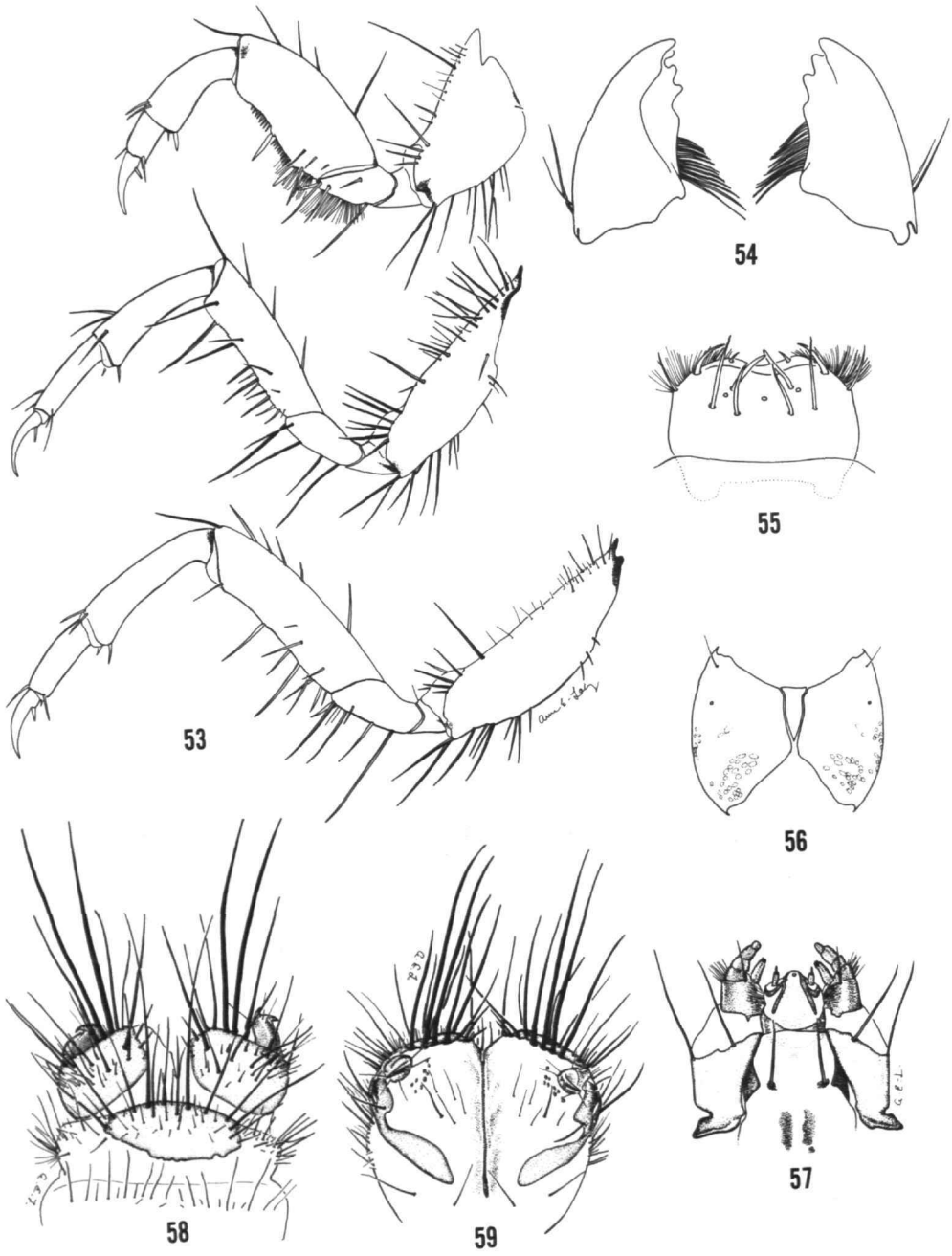
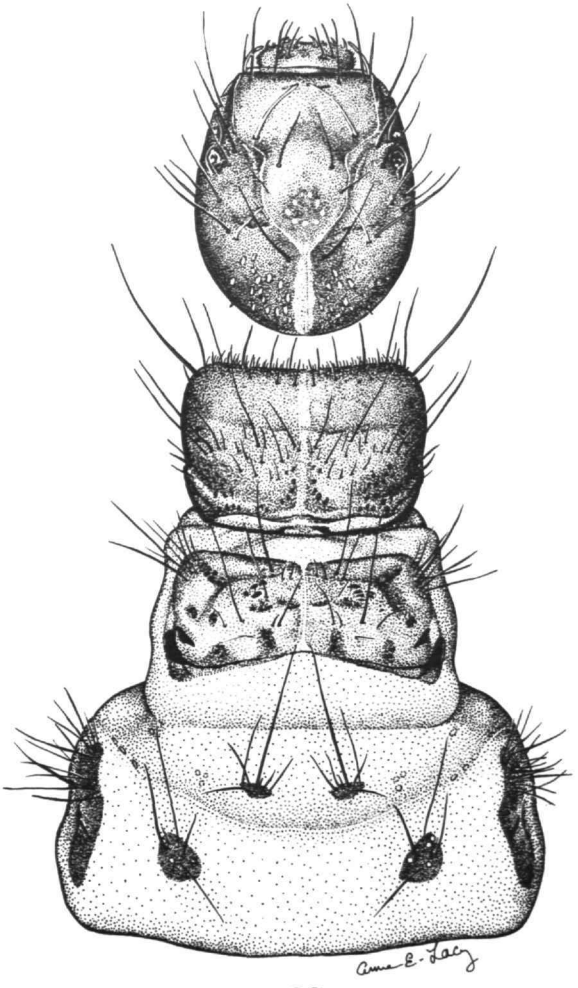
FIGURES 46–49.—*Magellomyia ?stenoptera* Schmid: 46, head and thorax, dorsal; 47, apex of abdomen, dorsal; 48, anal prolegs, ventral; 49, case, lateral.



FIGURES 50–52.—*Metacosmoecus nigrofasciatus* Schmid: 50, head and thorax, dorsal; 51, larva, lateral; 52, case, lateral with posterior opening, posterior.



FIGURES 53–59.—*Metacosmoecus nigrofasciatus* Schmid: 53, fore-, mid-, and hind legs, lateral; 54, mandibles, dorsal; 55, labrum, dorsal; 56, head, ventral; 57, maxillolabium, ventral; 58, apex of abdomen, dorsal; 59, anal prolegs, ventral.



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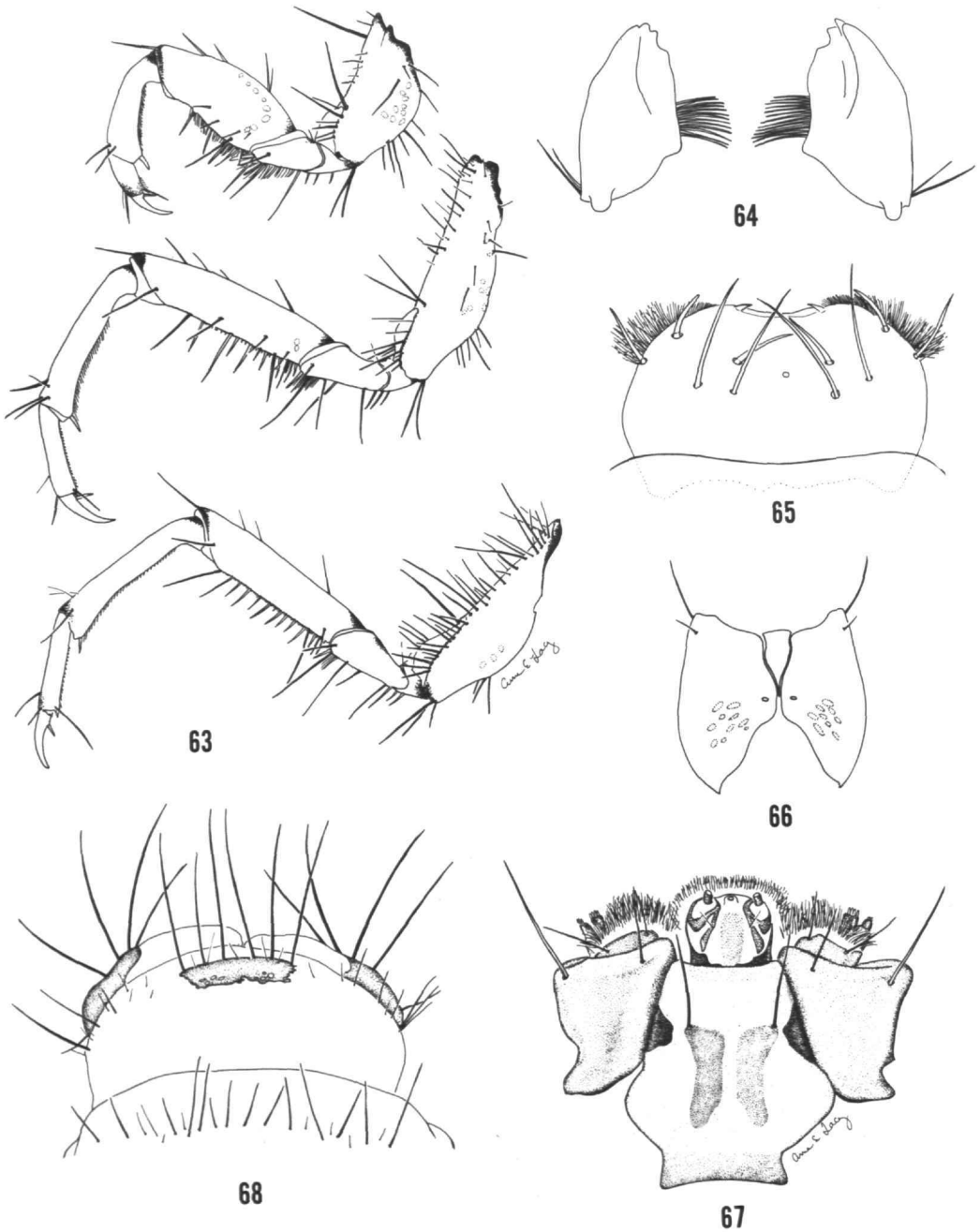
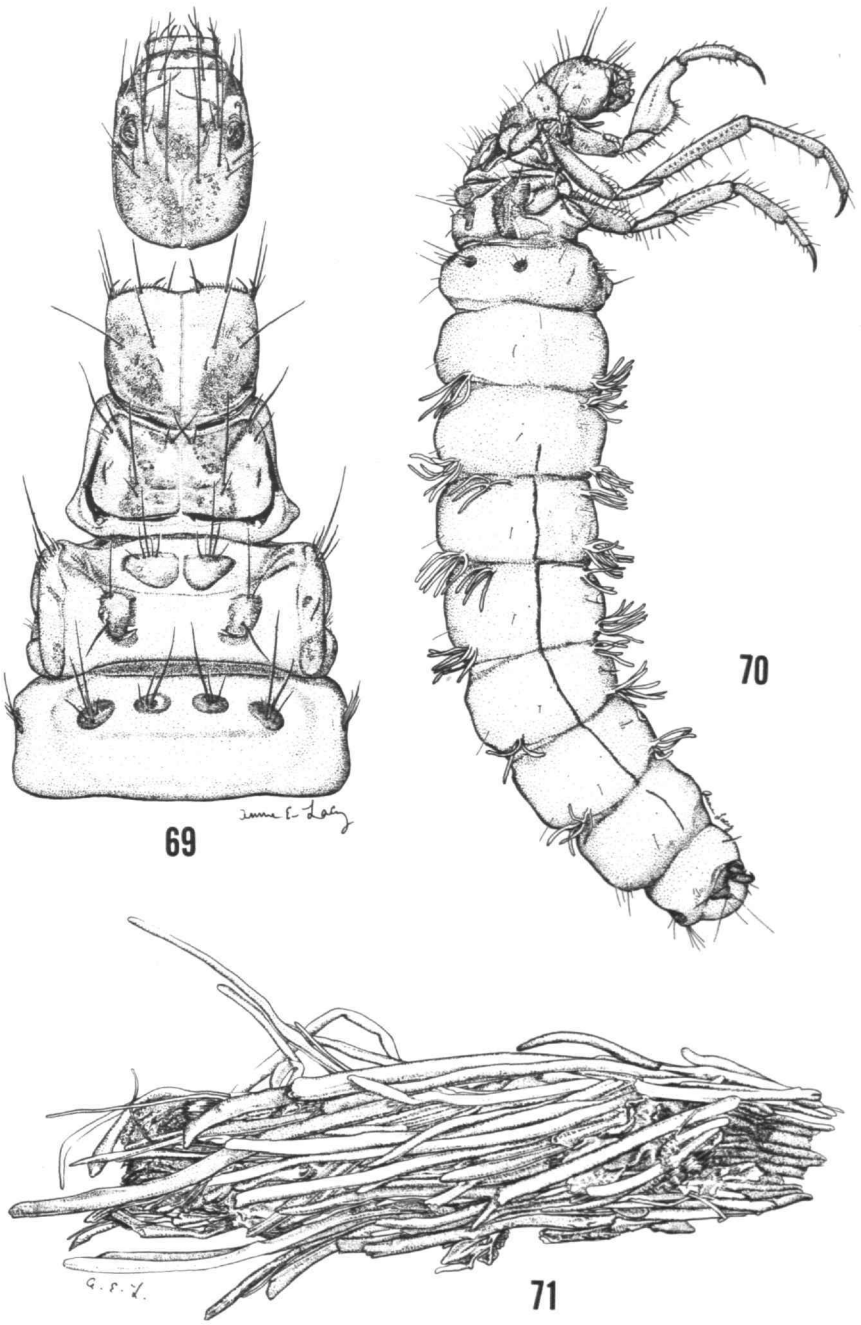
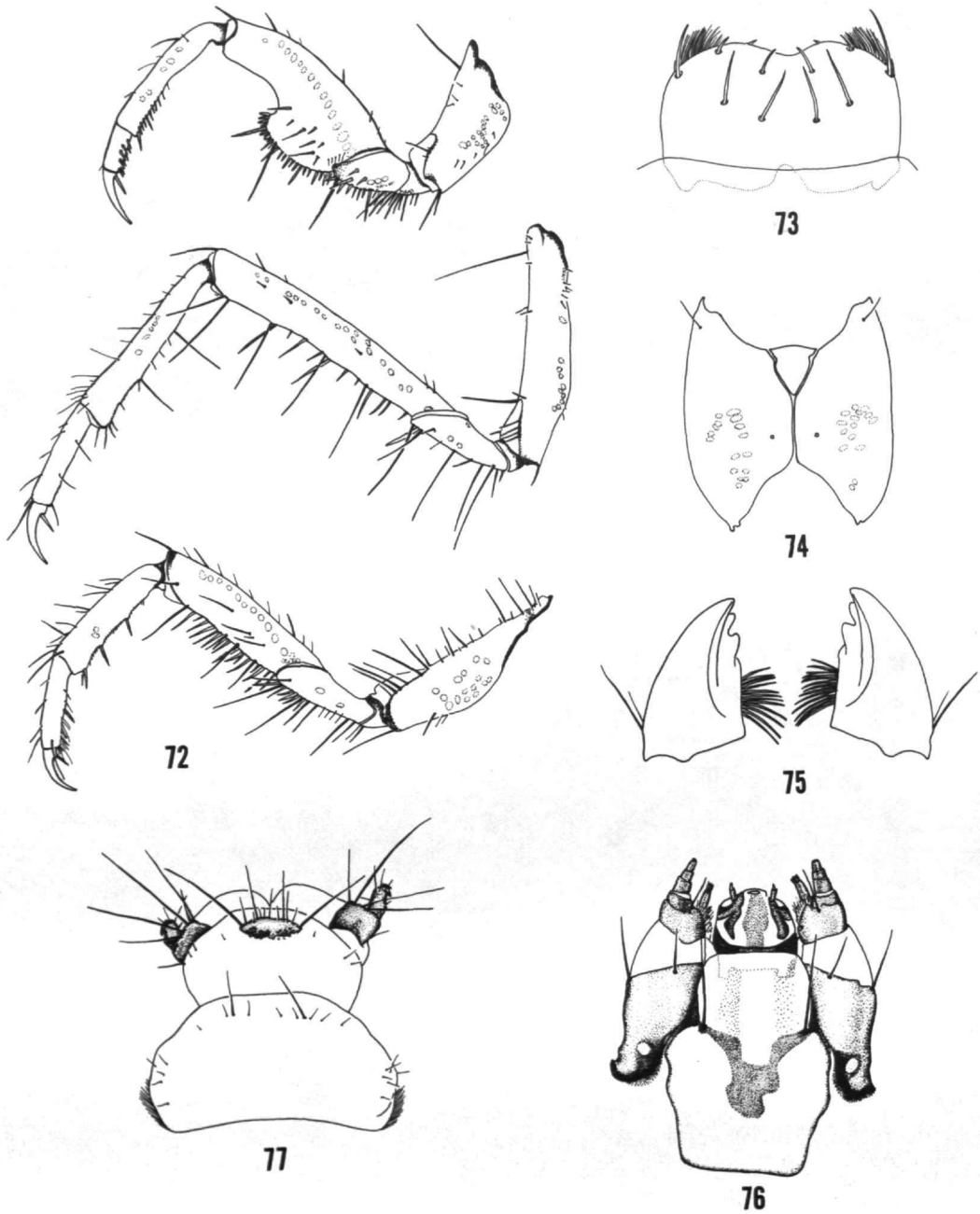
FIGURES 60–62.—*Monocosmoecus vanderweeli* Ulmer: 60, head and thorax, dorsal; 61, larva, lateral; 62, case, lateral.



FIGURES 63–68.—*Monocosmoecus vanderweeli* Ulmer: 63, fore-, mid-, and hind legs, lateral; 64, mandibles, dorsal; 65, labrum, dorsal; 66, head, ventral; 67, maxillolabium, ventral; 68, apex of abdomen, dorsal.



FIGURES 69–71.—*Platycosmoecus beaumonti* (Schmid): 69, head, thorax, and first abdominal segment dorsal; 70, larva, lateral; 71, case, lateral.



FIGURES 72–77.—*Platycosmoecus beaumonti* (Schmid): 72, fore-, mid-, and hind legs, lateral; 73, labrum, dorsal; 74, head, ventral; 75, mandibles, dorsal; 76, maxillolabium, ventral; 77, apex of abdomen, dorsal.

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