A TAXONOMIC REVIEW OF THE GENUS MARUINA
(DIPTERA: PSYCHODIDAE)
A TAXONOMIC REVIEW OF THE GENUS *MARUINA*
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*By Charles L. Hogue*

NATURAL HISTORY MUSEUM
LOS ANGELES COUNTY
SCIENCE BULLETIN 17

JUNE 29, 1973
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MUSEUM OF LOS ANGELES COUNTY

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A TAXONOMIC REVIEW OF THE GENUS MARUINA
(DIPTERA: PSYCHODIDAE)1

By CHARLES L. HOGUE2

ABSTRACT: Larvae and pupae of psychodid flies in the New World genus *Maruina* live as epilithic torrents coales in mountain streams from British Columbia to northern Argentina. Adults frequent emergent boulders and shaded streamside retreats. New investigations on the anatomy of these stages reveal many characters suitable for species discrimination and grouping, especially in the larval chaetotaxy, trumpet shape and surface ornamentation of the pupa, and genitalic structure in the adults. Using new criteria, the genus has been divided into two subgenera, *Maruina* Müller and *Acucina* Hogue. New subgenus. The number of species since the last review (7) is expanded to 26 with the description of the following new species: (Acucina) amadora (Mexico, Costa Rica, Argentina), amada (Costa Rica), querida (Costa Rica), cachita (Costa Rica), muchacha (Costa Rica), doncella (Argentina), chaborra (Colombia); (Maruina) namorada (Brazil), chamaqua (Mexico, Costa Rica), chamaquila (Costa Rica), bellaca (Argentina), gorota (Brazil), chica (Costa Rica), cachita (Peru), dama (Costa Rica), campesina (Colombia), vidamina (Costa Rica), rica (Costa Rica), nina (Costa Rica). The genus needs much more taxonomic and morphologic work, since many undiscovered species probably exist and adaptations of all stages to their stressful environment are not understood.

INTRODUCTION

This study was initiated with the idea of adding a few new species to the seven previously known (Quate and Wirth, 1951; Vaillant, 1963b) and completely revising the genus. However, even at the outset it became apparent that the number of undiscovered species must be considerably more than expected if one can extrapolate from the rate at which they began turning up in my own field work and in museum material. In the Neotropical region, my collecting during the last five years has yielded at least one new species, and often two, at almost every new locality I have visited. In addition to the 18 new species named in this report, I expect to be able to describe several more when more material becomes available to support that already at hand, and many more will surely be found when these flies are collected more extensively than in the past. By reason of this incompleteness in our knowledge, I have refrained from attempting a full taxonomic revision of the genus, preferring at the present only to present significant new information on its anatomy and general classification and to publish names and descriptions of the new species. The conclusions are based on an examination of over 11,000 specimens.

Species of *Maruina* are seldom collected because of their small size and inconspicuousness. Yet, they are common and easily taken if the stream collector spends a little time to search for the imatures on small, smooth submerged rocks or at the waterline of large emergent stones and to find and aspirate the adults in their hiding places under overhanging boulders or fallen trees. Adults also can be seen running over exposed stones onto which they have ascended after emerging from their pupae and prior to taking their first flight.

The collector should attempt to preserve long series of all stages because of the frequent occurrence together of two or more species, some being very much rarer than others. This practice also assures sufficient chance to encounter specimens from which an association of stages can be made. These consist of (1) prepupal larvae, (2) partially molted larvae or pupae, and (3) mature pupae, all of which are useful as follows:

(1) Through the integument of a prepupal larva the respiratory trumpets of the pupa, and other structures, can be seen.

(2) The persistent skin of a larva collected during pupal ecysis can be associated and mounted with the pupa.

(3) From a mature pupa, a completely formed adult may be dissected. These specimens, though tender, reveal reliable genitalic and other characters. Such adults are best mounted on slides in a dorsoventral position. In general, I have not

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chosen the usual procedure of lateral mounts for psychodids because of the depressed shape of dissected *Maruina* adults and because genitalic characters are better revealed by the dorsoventral orientation.

By such overlapping associations of larva-pupa, pupa-adult, the three major stages of most species can be ascertained. This I call the *continuity method* and was the manner in which all the stage associations of all but one (larva of *vidamia*) of the present species were made.

A second, less reliable, method to associate stages can be used in some cases. This is the *statistical method* and consists of equating the frequency of occurrence of each stage to the number of species present. That is, the most common larvae, pupae, and adults belong to the same species, the next most common to a second species, and so on. Although this method can be misleading, it is useful in preliminary sorting of material and in directing field work.

*Individual rearing* of larvae to adults is the only absolute technique for establishing stage associations but has not been done with most torrenticolous insects because of the difficulties of maintaining specimens in fast-moving water.

**ACKNOWLEDGMENTS**

For the loan of material, I wish to thank the following collectors and curators and their respective institutions: L. L. Pechman, Department of Entomology and Limnology, Cornell University [CU]; A. Stone and W. W. Wirth, Agricultural Research Service, U. S. Department of Agriculture, National Museum of Natural History [USNM]; P. Wygodzinsky, American Museum of Natural History [AMNH].

The majority of the specimens recorded are deposited in the Natural History Museum of Los Angeles County [LACM]. The types of the new species from Brazil are deposited in the Museu de Zoologia da Universidade da São Paulo, Brazil [MSP].

I thank my colleagues P. H. Arnaud, Jr., J. N. Belkin and J. P. Donahue for critically reviewing the manuscript, and for miscellaneous contributions and assistance in field work, my appreciation is extended to Drs. John E. S. Dockweiler, José H. Guimarães and John T. Polhemus.

Mention should also be made of the generous contributions of time and talents made by Charlotte Low and Leonora McTernan in the completion of the mechanical tasks attending this work.

**ECOLOGY AND DISTRIBUTION**

Ecological information on *Maruina* is extremely fragmentary, and only general remarks about the habits of the genus as a whole can be made presently.

The immatures are members of the epilithic fauna of fresh water streams and shallow rivers. Both larvae and pupae live on smoothly polished granitic or basaltic rocks which are completely submerged in swift to torrential waters and also often above the water level in the splash zone on emergent boulders. In some areas they are found on the smooth faces of broken, fine-grained sedimentary rocks (siltstones).

Larval habits closely parallel those of Old World psychodids with flattened, sucker-bearing larvae (*Neotelmatocephalus*-Java, *Horaiella*-India, *Neomaruina*-South Africa) and with the larvae of the Blephariceridae and Deuterophlebiidae. Presumably their food is diatoms and algae browsed from the rock surface.

The pupae adheres to rocks in company with the larvae. I have found those of a number of species parasitized by an undescribed genus of diapriid wasp.

Adults emerge from submerged pupae or from exposed pupae damp with spray. They are active fliers during the day (and possibly at night also, since specimens are occasionally taken at ultraviolet light). Resting places are all streamside and include overhanging boulders, fallen and hollow trees and vegetation. The food of the adults is not known.

**TABLE 1**

Species of *Maruina* known to occur syntopically (All associations of a given species not necessarily at same locale)

<table>
<thead>
<tr>
<th>amada</th>
<th>amadora</th>
<th>x</th>
</tr>
</thead>
<tbody>
<tr>
<td>chamaca</td>
<td>x x</td>
<td></td>
</tr>
<tr>
<td>chamaquita</td>
<td>x x</td>
<td></td>
</tr>
<tr>
<td>chica</td>
<td>x x x x</td>
<td></td>
</tr>
<tr>
<td>cholita</td>
<td>x x</td>
<td>x</td>
</tr>
<tr>
<td>dama</td>
<td>x x x x x x</td>
<td></td>
</tr>
<tr>
<td>garota</td>
<td>x x x x</td>
<td></td>
</tr>
<tr>
<td>muchacha</td>
<td>x x x x x x x</td>
<td></td>
</tr>
<tr>
<td>namorada</td>
<td>x x x x x x x</td>
<td></td>
</tr>
<tr>
<td>nina</td>
<td>x x x x x x</td>
<td></td>
</tr>
<tr>
<td>querida</td>
<td>x x x x x x</td>
<td></td>
</tr>
<tr>
<td>tica</td>
<td>x x x x x x</td>
<td></td>
</tr>
<tr>
<td>vidamia</td>
<td>x x</td>
<td>x x</td>
</tr>
</tbody>
</table>


In a given area in a stream, often in a few square meters and even on a single emergent boulder or submerged stone, more than one species of *Maruina* may occur. Many species from Costa Rica have been collected in company with one or more others (see Table 1). On two successive days, I collected eight species (*amada, amadora, chica, choluta, dama, nina, querida* and *vidamia*) from the waterfall at the rock quarry at Las Cruces, near San Vito, in Costa Rica. Syntopic associations of four and seven species are known, although most commonly one finds together two or three species, usually belonging to different subgenera or species groups.

It is probable that slight differences in feeding habits, adult flight times or other moment isolating mechanisms are in operation to maintain the integrity of these species and avoid competition, but of these factors we know nothing at present. I would suggest this genus as potentially useful in studies on the validity of Gause’s Principle.

The genus is restricted to the New World, ranging from British Columbia, Canada, southward through the Rocky Mountains, Pacific coastal mountains and Andean Cordillera, to Argentina and disjunctly in southeastern Brazil.

### ANATOMY AND TAXONOMIC CHARACTERS

#### Larva

**General.**—The fully labelled figure (Fig. 17) of *chaborra* depicts a typical larva (see Table 2 for a summary and explanation of terminology). In this species the general form is depressed and parallel-sided (*elongate*), but there is a tendency for many species to be very strongly flattened and broadened (*elongate-oval*), a condition reaching an extreme in the very broad larva of *chamaca* (*oval*).

The head is triangular in outline. The angle and shape of the posterolateral corner of the gena varies between species as does the pattern of small integumentary denticles. The mouthparts project through a circular anteroventral orifice. Mouthpart morphology including chaetotaxy has not been studied in detail for this genus, although good specific characters are certain to be found. The shaft of the antenna is entirely missing and the organ is represented in all species only by a group of three unequal, prominent trichoid setae (one very long) and a short basiconic sensillum arranged on a circular protuberance in the center of the parietal area.

The trunk, as in all psychodid larvae, is comprised of the three thoracic (pro-P, meso-M, and meta-T) and seven (I-VII) abdominal segments.
Dorsally the trunk segments are provided with sclerotized tergal plates (27 in all), transverse in orientation and in three series: (1) a middorsal series (called simply tergal plates or tergites for simplicity), one corresponding to each of the annuli, plus an additional one residing on segment VII—those of annuli 1 and 2 are broken mesally by an ecdysial suture; the anteriormost of the meso- and metathorax are small and widely separated; (2) a dorsolateral series (platelets) of small circular plates, one each midway between the middorsal plate and lateral margin of each segment except VII, where six additional plates are present; (3) an interannular series, variously developed transversely on a line between certain annuli.

The shape and degree of sclerotization, particularly of the middorsal tergal plates, offer criteria for distinguishing species.

The tergal plates are designated, after the system originated by Feuerborn (1927), as pro- ("pr"), meso- ("ms"), and meta- ("mt") according to their position anteriorly, medially or posteriorly on each segment (abbreviations according to Vaillant, 1963a, b). The following arrangement is consistent throughout the genus: protergites absent from the prothorax; mesotergites very small and separate on the meso- and metathorax; abdominal segments I, complete and subequal in size to the meso- and metatergites of segments II-VII, all of which are complete transverse trapezoidal plates.

The dorsolateral platelets seem to be fragmented portions of the metatergal plates (as indicated by an associated hair mt6, Vaillant, 1963b: 80-81).

The interannular platelets are frequently obscured by overfolding of the annular borders and often poorly sclerotized laterally.

The appearance of the trunk ventrally is dominated by eight large, circular suckorial discs or suckers. The anteriormost is larger than the succeeding and completely closed by an encircling fringe of fine, radiating filaments.

The fringe of suckers 2-7 is incomplete anteriorly. The center of each is occupied by a group of characteristically shaped and positioned callosities, marking the insertions of the dorsoventral muscles which control the piston (central disc) of the sucker. The detailed anatomy of these ventral suckers has not been studied but appears similar to homologous organs in other psychodid and blepharicerid larvae (Feuerborn, 1932; Komárek, 1914).

The entire integument of the trunk dorsally and ventrally has an alveolar appearance (except for a clear zone bordering the ventral suckers). Each of the alveoli is provided with a tubercle or process whose diversity is tremendous over different portions of the trunk and among the species. A detailed study of the anatomy and distribution of the alveoli and tubercles was not attempted because of the difficulties of discerning fine structure on whole mounted specimens with light microscopy, although the peripheral pattern is figured and briefly described. However, a cursory examination with the scanning electron microscope revealed a wide variety of types. Elongate larvae have relatively simple processes; ovoid larvae display elongate processes with ramified or fringed apices along the entire pleuron, and an especially complex and dense integumentary garniture is present on the dorsum of the larva of amadora.

The sclerites of the siphalon segment are easily homologized with counterparts in more primitive psychodid larvae. The dorsal plate covers the dorsal and most of the lateral portions of the segment. The shape and processes of this plate are species specific. Ventrally the segment bears a central preanal plate and flabellar plate from which extend the six retractable anal branchiae. Terminal, the siphalon segment bears one pair each of articulated flabellar processes, a smaller and more lateral dorsal pair and a larger, more medial, ventral pair. The number and length of "hairs" in these fringes varies according to the species. A bipartite fringe of long, plumose hairlike processes border the posterior margin of the dorsal plate and the flabellar processes (terminal fringe).

Chaetotaaxy—Maruina larvae bear only true setae (sensu Feuerborn, 1927). All are relatively small (some are lacking) and of the type designated "setulae" by Vaillant (1959: 41). Also lacking are his so-called "ectorial true setae;" all Maruina larvae live in clear-flowing streams where lime or mud coverings do not develop.

Although eventually the true setae of all psychodid larvae may be homologized, making possible a universal system of nomenclature, this was not attempted for the present review primarily because of inadequate published chaetotaxy data and specimens of other genera for comparative study. The arrangement and development of setae in Maruina is remarkably constant and explained in the fully labeled figure 17. For present descriptive purposes, the nomenclatural system originated by Feuerborn (1927) and developed by Vaillant (1963b) is followed with these minor modifications:

1. I have numbered sequentially the hairs of each group to allow specific reference.
2. I have interpreted certain hairs differently, requiring another terminology:
a. The taxonomically important ventral bristle which Vaillant considers a laterally displaced member of the posterior or metasternal row of sternal setae (p. 82: "... quarte parmi les six soies de la rangée postérieure sont: tout contre la frange en arrière; les deux autres sont au voisinage des lobes latéraux."). I believe may be, rather, not a sternal hair but an ancillary pleural hair (here called subpleural-sp). It is present in other psychodid larvae in a position near the true pleurals.

b. I consider Vaillant's hair a1 to be a persistent protergal hair (pr2); pr1 is lost in all Maruina.

c. A pleural hair seems to have been lost in Maruina on the abdominal segments.

d. Some compression of the median dorsal portions of the meso- and metathoracic segments, evident from the diminution of their mesotergal plates in all species and loss in chaborra, cholita and amadora, seems to be associated with a variable loss of some intertergal and mesotergal bristles on that portion of the thorax, especially ms. These are hairs that I call ms1, ms2 and ms3 in figure 17 and which correspond to the three mesotergal hairs of Telmatoscrupus and other genera. They are equivalent to Vaillant's "ms" which he shows in his drawings of the larval dorsum (plate 3).

Curiously, the minute hair anterolateral to the mesotergal plate in other psychodid larvae persists on all the trunk segments, and presently I consider it a serially homologous intertergal hair (it). It corresponds to Vaillant's "s1" on the thorax and "pr" on the abdomen. The hair, though tiny, characteristically is spiniform and has a median un sclerotized zone, apparently giving it some degree of flexibility.

The following variations in chaetotaxy occur, which are useful in classification:

1. Hair sp has two positions. In the larvae of some species, which I consider primitive because of their elongate shape (e.g. chaborra), it is lateral and closely associated with the pleural hairs on the abdominal segments. In the strongly flattened, derived species (e.g. chamaca) it is situated considerably more medially on these segments.

2. The pleural hairs (p) and pr2 assume varying degrees and combinations of length and branching, providing good taxonomic characters.

3. A conspicuous posterolateral seta (sl3) on the siphonal segment is variously branched or spiniform in the subgenus Aculicina, another characteristic useful in distinguishing species.

**Pupa**

The pupa is a strongly flattened, ovate or elliptical discoid object, only slightly longer than broad. The anterior end is the broader and is dorsally swollen to contain the developing imaginal thorax and head; caudally the abdomen tapers gradually and encases the strongly depressed abdomen of the adult.

Figure 69 depicts the gross anatomy and explains the terminology of the pupal dorsum. The anteriormost frontal and parafrontal sclerites are sometimes (subgenus Aculicina) incompletely separated by a frontal suture which does not reach the anterior margin of the pupa. The shapes of the remaining sclerites are very constant in all species. The genital segment tends to be constant in shape and size regardless of the sex of the developing imagos.

Developed to varying degrees are minute, arature irregularities in the integument which are bordered on one side by an area of pigmentation darker than that of the general dorsum. These crenulae often coalesce into linear series and provide an array of constant patterns which are of great use in distinguishing species. Typically, the crenulae border each abdominal segment anteriorly and posteriorly but in some species also run around the entire segment periphery and may also take varying courses across the scutum,alar sclerite and even frontal sclerite. This ornamentation reaches an extreme in chaborra, in which the sclerotizations mark rectangular areas giving the pupa an "armor-plated" appearance.

Also providing markers to delimit species are groups of circular blemishes termed escharae mediately on each abdominal segment. These marks represent vestiges of the small lateral sclerotizations of the larva to which muscles are attached.

The general pigmentation of the dorsum is usually homogeneous in density (black in life) but in some species tends to diminish laterally on the abdomen. A characteristic dark and light pattern results which serves to distinguish species, in a way particularly useful in the field.

The shape of the trumpeter serves as the best species character in this stage. Each species is identifiable immediately by its shape, size, position and type of pinna. The latter is of two basic types: a radially or randomly arranged nest of facets (fasciculate) and a linear series of rachi forming a kind of sieve plate (craticulate). In the descriptions, the full number of rachi are cited for the former, one-half the complement for the latter (number of pairs). In standard whole-mount slide preparations it is difficult to discern the fine structure of the pinna.

Curiously, some species, neamorada and at least one unnamed entity from Costa Rica, lack the
trumpet entirely. The respiratory role of this organ, when present, is unknown. Though similar in general appearance to the culicid trumpet, it cannot tap atmospheric oxygen, since the pupae are bound to the substratum and usually are continually completely submerged. Nevertheless, in all species save those just mentioned, a trumpet and pinna are well developed, and an internal canal leads to a tracheal branch situated at the base of the trumpet. In the above-mentioned species this trachea is vestigial. The trumpet, because of its dense integument, would not seem to function as a plastron gill as do the homologous organs found in Blephariceridae, Deuterophlebiidae and other aquatic Diptera.

Trumpet size also varies considerably among species. A useful measure for comparative purposes is the ratio of its length (base to apex) to the distance from its base (inside margin) to the edeysial suture. This ratio is abbreviated in this paper to "T/BE."

Ventrally the flat membranous integument is marked only by weak folds delimiting the cases for the head and thoracic appendages. I have not been able to discern in any of my material the tiny hairs mentioned and figured by Vaillant (1963b).

ADULT

General.—In this study little consideration has been paid to the adult morphology aside from that of the genitalia. The reasons are (a) the constancy in most general structural features throughout the genus, offering few characters of applicability at the species level and (b) the incompleteness of most of the material. However, some attention was given to the antenna and interocular space. The size and shape of the tarsal claws, and antennal sensory filaments (ascoids), tarsal, palpal and antennal segment proportions, mouthpart structure and vestiture offer potential as species characters but require more material to permit adequate study.

The antennal segments are fairly constant in shape and number: the scape and pedicel are enlarged as typical for Nematocera, the former being slightly longer than the latter and less rotund. The flagellar segments are usually 14 in number and barrel-shaped or truncated subpyriform, the apical often ovoid. In the male of amadora, flagellar segments 1-7 are strongly compressed.

Male genitalia.—The male genitalia of Maruina (figure 54) are similar in most respects to other genera of Psychodidae. Great differences are to be found, however, in the structure of the aedeagal complex. The simple paramere and aedeagal rods of Psychoda, etc., are replaced by a bundle of numerous aedeagal spines lining the distal portion of the ejaculatory duct. Often these spines are of two or more sizes and shapes; most commonly there are fewer broad and short major aedeagal spines and much more numerous, slender and long minor aedeagal spines. In most adult specimens taken in the field and all terminal individuals dissected from mature pupae, the aedeagal spines are nested together within the ejaculatory duct, the retracted position. The spines are sometimes partially exerted in mature sexually active specimens, and then the major spines are separated from the minor and are even rotated anteriorly when the aedeagal membrane is fully expelled. The shape and number both offer excellent specific characters in this genus.

Surrounding the aedeagal spines is the aedeagal sheath, which is swollen anteriorly into a bulbous structure, itself encased by the wall of the aedeagal capsule. Posteriorly, the aedeagal sheath forms a cylindrical tube of varied shape, length and with sclerotizations in its wall. In a few species (chaomaca and relatives) the apex of the sheath is reinforced by a narrow, transverse, deeply sclerotized arch of specific shape.

As in other Psychodidae, differences in the shape and length of the surstyle, dististyle and subgenital valve offer convenient taxonomic characters at the species level. Also of importance are the degree of development and sclerotization of the ninth sternite. The tenaculum of the surstyle is extremely uniform in character and is seldom of value in distinguishing species.

Female genitalia.—The bulblike or saccular spermathecae of most Psychodidae are greatly modified in the genus Maruina into a very complex set of articulated apodemes and vesicles which I refer to collectively as the spermathecal complex (fig. 55). Basically, each half of the complex is composed of an anterior vesicle (corpus spermathecae) which usually bears a lateral triangular flange, the cornus spermathecae. Although the latter often varies in shape and degree of development, these features offer fairly reliable species characters. The corni often are contrary, their apices pointing in directly opposite directions but may diverge to a lesser degree. The angle derived by drawing a line through the median axis of a cornus to the midline and thence through the axis of the opposite horn is a useful species criterion and is termed the intercorneal angle. Connecting the corpus spermathecae to the subgenital plate is a broad, flat apodeme, the pons spermathecae.

All the elements of the spermathecal complex
vary specifically in shape, offering excellent taxonomic characters. The same may be said of the subgenital plate, whose internal structure is more complex than in other psychidias. The complexities are so great that it is impossible to fully understand the plate's configuration in ordinary whole mounts. For this reason and until more detailed anatomical work is done, I have given the various taxonomically useful folds and borders temporary, arbitrary designations: folds are lettered A, B, C; margins are numbered 1, 2, 3. (See figure 55.) Margins 1 and 2, particularly, are extraordinarily modified in different species, the former often displaying large lobes. The twin, major lobes of the subgenital plate also offer criteria for species' discrimination in size, shape, and the depth of the space between them.

A pair of small internal bristles (lateral bristles) occurs consistently near the anterolateral corner of the plate. Their position and insertion is of two types corresponding to the subgenera (see descriptions). Though not utilized in this instance, the length of the point of the pagio (daggershape media sclerite immediately anterior to the subgenital plate) is a potentially useful species character.

Encircling the base of the genitalia is a straplike sclerite, the post marginal sclerotization (eighth sternite?) which varies, according to the species, in thickness and degree of sclerotization.

The cerci in Maruina are membranous, short and broad-based, unlike the elongate, sclerotized organs typical of most other Psychodidae. Their general shape varies according to species but is difficult to assess in the usual dorsoventral slide mounts. Of more use is the character of the basal, ligulate sclerites.

**TAXONOMY**

**TERMINOLOGY AND PROCEDURE**

*General.*—The terminology pertaining to larval chaetotaxy and other structures largely follows Vaillant, 1936a, b; see figures and the section on Anatomy and Taxonomic Characters for a full explanation.

Measurements are all means given in millimeters; all statistics are calculated from a random sample of ten specimens unless otherwise noted. Values were taken for the immature stages as follows: larva: length = extreme apex of the head capsule to the posterior extremity of the dorsal plate of the siphonal segment; width = the transverse dimension of the trunk at the widest point not including integumentary processes or unusually developed lobes; pupa: length = extreme anterior margin of the frontal sclerite to the posterior margin of the genital segment; width = the transverse dimension of the trunk at the widest point.

*Larva.*—Detailed statistics on the number of branches in larval hairs were not calculated; the values given are modes noted by simple inspection of varied sized samples only of mature, fourth instar individuals. Not described in detail for reasons of insufficient material or unimportance are the structure and distribution of the various types of alveolar tubercles and processes, although the peripheral pattern was considered. Also not shown on the figures or described are the anal branchiae. Pigmentation patterns are best evaluated in alcohol-preserved specimens. Some hairs not noted in the descriptions and not drawn may be present but are unobservable because of poor material.

*Pupa.*—Only the dorsal characters of the pupa were used; the ventral, membranous appendage cases are of little importance in evaluating taxa.

*Adult.*—The majority of the new species are known in the adult stage only from specimens dissected from mature pupae. Although well sclerotized genitalic structures and meristic characters are reliably discerned in such material, many other features, notably color pattern, vestiture, size and the shape of the appendages, are not because of the unexpanded, teneral state of the unborn adult. For this reason, the descriptions of these species will be deficient. Also, the illustrations of the shape of the surstyle of the male genitalia and size of all structures is not necessarily that of the mature fly.

**ETYMOLOGICAL NOTE**

The names of all the new species are words used in Latin America (all Spanish except garota, which is Portuguese) in an affectionate or endearing sense for women or girls. All are considered feminine nouns and are placed in apposition to the generic noun. The name for the new subgenus is derived from aculco, an Aztec word used to denote relation to a place where water turns or is deflected, in reference to the habitat of Maruina. Its gender is arbitrarily designated as feminine.

**Genus MARUINA** Müller

**REFERENCES**

The extensive synonymy of Quate, 1955: 238 need not be repeated. Additions are as follows:

Maruina Müller, 1895.
Descriptions

Larva

General.—Body onisciform (convex dorsally, flat ventrally); shape varying from elongate (parallel-sided) to broadly oval.

Size.—Small for Psychodidae. Length ranging from 1.9 to 3.1.

Pigmentation.—Generally very strongly pigmented, dark brown to black, occasional species with light and dark patterns. Head, siphonal segment and dorsal tergites well sclerotized except last sometimes lightly sclerotized on some segments.

Structure.—Trunk divided laterally into 25 annuli as follows: thoracic segments and abdominal segment I each with two annuli, abdominal segments II-VI each with three annuli, segment VII with two annuli. Head triangular. Antennal shaft absent, antenna represented only by a long spine and several small spines and a rod. Prothoracic spiracle minute and not raised, located dorsolaterally on the second annulus. Integument alveolar, each alveolus with a central process of varied size and shape, alveolar structure complete except for a clear zone lateral to the ventral suckers. Transverse tergal plates present on all trunk segments: prothorax with two broad, adnate plates, divided on midline; meso- and metathorax each with a pair of small anterior, separated plates, and mesally complete, elongate posterior plates; abdominal segment I with a pair of small anterior, separated plates and two posterior, parallel, mesally complete posterior plates; abdominal segments II-VII each with three complete plates; rows of small, circular platelets between borders of tergal plates and lateral body margin on intersegmental and interannular lines.

Venter of trunk with eight large fringed suckers; fringe completely encircling anteriormost sucker, open anteriorly on suckers 2-8. Siphonal complex short; dorsum completely sclerotized, fringed posteriorly, dorsal flabellar processes very small, fringed; ventral processes larger, also fringed; preanal plate quadrate, densely fringed with setiform spines on posterior border; lateral plates small, located anteriorly and laterally of preanal; six short anal branchiae.

Chaetotaxy.—Hairs all of primary type, i.e., true setae with movable setiform process in alveolar base. Dorsal and ventral hairs all very small, those situated on tergal plates minute; lateral hairs longer and more conspicuous. Basic pattern very constant and illustrated in figure 17.

Pupa

General.—Body rigid, strongly depressed; ovoid to elliptical in outline, broader and deeper anteriorly. Slightly convex dorsally, flat ventrally.

Size.—Small for Psychodidae. Length ranging from 1.8-2.3.

Pigmentation.—Color black or deep brown, pigment evenly distributed dorsally or sometimes with light areas laterally on abdomen. Ventral integument unpigmented. Ornamentation of series of minute accurate indentations (crenulae) and circular escharae often present in dorsal integument.

Chaetotaxy.—Dorsal bristles absent (or extremely minute, arranged in constant series on scutum and abdominal tergites; according to Vailiant, 1963b, plate 5).

Structure.—As a result of strong depression of body, ventral unpigmented sclerites poorly defined; wing cases lanceolate, reaching posterior tip of pupa. Sclerites dorsally as follows (anterior to posterior) : frontal and parafrenal, sometimes incomplete frontal suture separating; two scutal plates (lateral area termed alar sclerite) separated by a strong ec dysial suture; strap-shaped mestascutal, followed by seven increasingly narrow abdominal segments, terminated by a capsular genital (segments VIII-XI) segment. A rigid, erect sessile trumpet situated anteromedially on each scutal sclerite (sometimes entirely absent); apex of trumpet modified into a pinna of few, radially arranged facets or linear series of rachi ("grid plate"). No lateral, cephalic or terminal spines or hooks present.

Adult male

Size.—Small, body length 1.0 to 2.0.

Pigmentation and vestiture.—Vestiture very dense, of lanceolate and linear scales over entire body and appendages. Scales grey to grey brown, often white at the wing tip. Integument generally well sclerotized.

Head.—General shape pyriform. Eye with median extension. Interocular suture present. Labelium short, bulbous, bearing a number of large bristles over apical surface and a number of setae on median margin of apical surface. Palpus more than three-fourths as long as antenna, segment proportions usually 1:1.2:1.3:2. Antenna with fifteen or sixteen segments; sensory filaments (ascoids) very
small, single; flagellar segments barrel-shaped or truncated subpyriform; terminal segment often slightly reduced, spherical, subequal to proximal segments.

Thorax.—Patagium absent. Wing very narrow, lanceolate, four times as long as wide; R_4 three branched; R_5 absent; bases of R_4 and M_4 not developed. Legs subequal in length, tarsal segment proportions approximately 5:1:1:1:2.

Abdomen.—Sternite II membranous.

Genitalia.—Surstyle elongate (short in one species), bearing a single, foliate tenaculum. Aedeagal armature consisting of a bundle of numerous long, slender and/or short, broad spines. Aedeagal sheath sclerotized, expanded anteriorly into a bulbous structure containing variously shaped (usually discoid) apodemes articulating with the aedeagal spines. Ninth sternite undeveloped midventrally to well-sclerotized and complete.

Adult female

Size, pigmentation, vestiture and body structure.—As in male.

Genitalia.—Subgenital plate bilobed and often petiolate. Cercus short, broad and largely membranous except for linear sclerites at base. Spermatothecae replaced by a complicated set of articulated sclerites broadly joined with the subgenital plate.

Species included

A summary of the distribution, stages known and list of the species included in the genus is given in Table 3.

Keys

At this incomplete stage in our knowledge of the genus, the following keys should be considered only diagnostic tables for the known species. It should be remembered that the probable existence of many undiscovered species and the lack of material of some stages of known species make identifications tenuous.

Mature Larvae

(muchacha, doncella, amada, querida and Species A Quate and Wirth unknown; boulderina and pennaki provisionally included; pilosella and spinosa excluded for lack of material)

<table>
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<th>Subgenus Amadora</th>
<th>Known Stages</th>
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<th>Costa Rica</th>
<th>Argentina</th>
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</tr>
<tr>
<td>2. amada</td>
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<td>+</td>
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<tr>
<td>3. querida</td>
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<td>+</td>
</tr>
<tr>
<td>4. chollita</td>
<td>new species</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>5. muchacha</td>
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<td>+</td>
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<tr>
<td>6. Species A</td>
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<td>-</td>
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<td>7. doncella</td>
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<td>8. chaborra</td>
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Subgenus Maruina

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Table 3

Genus Maruina
Included Species, Distribution and Known Stages
(Parentheses = material lost)
1. Hair sp I-VII lateral, contiguous with pleural hairs. (Fig. 17). Body form elongate. Hair sl3 of siphonal complex spiniform. Subgenus Aculcina ........................................ 2

Hair sp I-VII ventral, detached mesally from pleural hairs. (Fig. 29). Body form various. Hair sl3 of siphonal complex not spiniform. Subgenus Maruina ........................................ 4

Subgenus ACULCINA

2. Abdominal segments with two strongly developed lateral projections, an anterior bearing hair sp, the posterior without hairs. Spiniform integumentary tubercles extremely numerous and large. Hair sl3 of siphonal complex sessile or arising from a slight peduncle, shorter than hair itself. (Fig. 1) .................................... amadora Abdominal segments without or with only moderately produced lateral projections. Integumentary tubercles not conspicuously numerous or large. Hair sl3 of siphonal complex sessile or arising from a slight peduncle, shorter than hair itself. ........................................ 3

3. Hair sl3 of siphonal complex pedunculate. Abdominal segments with lateral, spined lobes. Hair mt6 long, simple. (Fig. 8) ........ cholita Hair sl3 of siphonal complex sessile. Abdominal segments without lateral lobes. Hair mt6, short, branched. (Fig. 17) ........ chaborra

Subgenus MARUINA

4. Abdominal segments strongly lobed laterally, posteriorly directed lobes of annulus 25 approximately reaching hair sl3 of siphonal segment. Body often oval, very broad and flat. (Fig. 26) ........................................ 5

Abdominal segments only shallowly or moderately lobed, posteriorly directed lobes of annulus 25 short and far from reaching hair sl3 of siphonal segment. Body usually elongate or slightly oval. (Fig. 65) ........................................ 9

5. Lobes of prothoracic annulus 1 strongly developed, similar in shape to posterior lobes of segment VII and directed anteriorly adjacent to head capsule. (Fig. 36) ........ chamaquita Lobes of prothoracic annulus 1 small, not developed as above. ........................................ 6

6. Length/width ratio of body 1.9 or less ........ 7

Length/width ratio of body 2.2 or greater 8

7. Hair pr2 I-VII one to two branched. (Fig. 26) ................................ namorada Hair pr2 I-VII three to five branched. (Fig. 29) ...................................... chamaica

8. Lateral lobes of posterior annuli of abdominal segments II-VII asymmetrical, apex oblique, acute. (Fig. 56) .................. campesina Lateral lobes of posterior annuli of abdominal segments II-VII symmetrical, apex rounded. (Fig. 47) .......................... chica

9. Two small groups of spines located ventrally near the lateral margin of each abdominal segment, a lesser, anterior group immediately posterior to the pleural hairs and a stronger group on the posterior annulus of the segment. (Fig. 44) .................................... gorota No such groups of distinctive spines ventrally on the lateral lobes of the abdomen .......................... 10

10. Hairs p3 M-VII and pr2 I-VII with numerous dendritic branches. (Fig. 23). Puerto Rico hirta Hairs p3 M-VII and pr2 I-VII with few (one to six), simple branches, at least hair p3 M with three or fewer branches. (Fig. 53). Mainland 11

11. Lobe of posteriormost annulus (25) undeveloped, not reaching to level of base of siphonal plate. (Fig. 53) ........................................ 12

Lobe of posteriormost annulus (25) well developed, reaching well beyond level of base of siphonal plate. (Fig. 73) .......................... 14

12. Siphonal segment elongate (length/width ratio 1.4). (Fig. 58) ....................... vidamia Siphonal segment broad (length/width ratio 1.2 or less) ........................................ 13

13. Tergites of segment V usually poorly sclerotized, distinctly pale compared to others. Length/width ratio of siphonal plate 1.0, widest point about at mid-length. (Fig. 65) ........ tica Tergites all equally well sclerotized. Length/width ratio of siphonal plate 1.2, widest point about at basal one fourth. (Fig. 53) ........ dama

14. At least one of hairs p3 M and T branched, usually both .................. 15

Both of hairs p3 M and T single .................. 17

15. Long fringe-tipped peripheral alveolar processes on anterior segments as well as posterior. Posteriormost annular lobe (25) slightly incurved. (Fig. 38) .................. bellaca Long fringe-tipped peripheral alveolar processes on posterior segments (V-VII) only. Posteriormost annular lobe (25) straight. (Fig. 73) ........................................ 16

16. Siphonal segment subhexagonate, widest almost at midlength. (Fig. 50). Peru .......... cuchita Siphonal segment subquadrate, widest basally. (Fig. 73). Western North America lanceolata

17. Siphonal segment subspheroid. ........ pennakii Siphonal segment distinctly longer than wide 18

18. Lobes of posteriormost annulus (25) divergent, directed away from siphonal segment ........... boulderina
Lobes of posteriormost annulus (25) parallel and close to siphonal segment. (Fig. 68) nina

Pupae
(pilosella and spinosa excluded for lack of adequate material)

1. Frontal suture incomplete (Fig. 11). Base of trumpet set in broad, heavily sclerotized collar (Figs. 9-12). Subgenus Aculicina ........ 2
   Frontal suture complete (Fig. 69). No heavily sclerotized, broad collar at base of trumpet (one exception-garota). Subgenus Maruina .... 9

Subgenus ACULCINA

2. Crenulae of abdomen delineating quadrature areas (Fig. 21) ................. chaborra
   Crenulae absent from abdomen or, if present, not delineating quadrature areas .......... 3
3. Integument of abdominal tergites finely papillate. (Fig. 10) ....................... amada
   Integument of abdominal tergites smooth 4
4. Abdominal tergites II-VII with strong crenulae. (Fig. 18) ....................... querida
   Abdominal tergites II-VII devoid of crenulae 5
5. Metascutum and abdominal tergite I with crenulae. (Fig. 12) ................... muchacha
   At least abdominal tergite I devoid of crenulae, usually also metascutum ................. 6
6. Trumpet capitulate, pinna undulate. (Fig. 9) .. 7
   Trumpet clavate, pinna straight. (Fig. 20) .. 8
7. One end of pinna extending proximally to nearly midpoint of trumpet shaft. (Fig. 9) amadora
   Proximal projection of pinna extending to approximately apical third of trumpet shaft. (Fig. 11) ......................... cholita
8. Pinna extending proximally to one-half of trumpet shaft, rachi around 50 (Fig. 20) doncella
   Pinna mostly apical, rachi 25-30. (Fig. 19) ................. Sp. A Quate and Wirth

Subgenus MARUINA

9. Trumpet entirely absent, basal tracheal branch atrophied. (Note: there is at least one other unnamed species in which the trumpet is likewise absent.) ................ namorada
   Trumpet present, basal tracheal branch well developed ................. 10
10. Trumpet with a conspicuous thumblike subapical projection. Integument finely spiculate. (Fig. 61) .................. chica
    Trumpet without lateral projections. Integument not spiculate ................... 11
11. Apex of trumpet uncinate or strongly curved anteriorly. (Fig. 64) ................. chamaquita
    Apex of trumpet straight ................ 12
12. Pinna a simple subapical pore (flush with the surface or on a slight elevation). (Fig. 32) .................... chama
    Pinna with at least 4 rachi ................ 13
13. Crenulae of abdominal tergites forming a longitudinal, submarginal line marking off a broad median dark zone from lateral pale areas. (Fig. 35). Trumpet shape as in figure ........ icia
    Pattern of crenulae and pigmentation of abdominal dorsum otherwise, trumpet shape varied ..................... 14
14. A series of 2-3 irregular ridges encircling the subapical portion of the trumpet (below pinna). (Fig. 42) ................. campesina
    Shaft of trumpet smooth proximal to pinna 15
15. Pinna of trumpet with 30-31 rachi. Base of trumpet set in a well sclerotized, broad collar. (Fig. 40) .................. garota
    Pinna of trumpet with 10 rachi or less. Base of trumpet not set in a collar ................. 16
16. Trumpet very short (length about one-half of frontal sclerite), capitulate. (Fig. 41) .... 17
    Trumpet longer (length equal to or greater than frontal sclerite), cylindroform or clavate .. 18
17. Lateromarginal crenulae of abdominal tergites present. Trumpet base strongly angled. (Fig. 41) .................. bellaca
    Lateromarginal crenulae of abdominal tergites absent. Trumpet base straight .... boulderina
18. Crenulae absent from scutum and abdominal tergites (faintly evident along posterior margins of latter). (Fig. 63) .............. hitta
    Crenulae distinct on scutum and abdominal tergites ......................... 19
19. Apex of trumpet darkly pigmented .. pennaki
    Apex of trumpet evenly pigmented throughout ......................... 20
20. Marginolateral crenulae of abdominal tergites present and in a distinct line. (Fig. 33) cachita
    Marginolateral crenulae of abdominal tergites absent or, if evident, irregularly scattered, not forming a distinct line .................. 21
21. Escharae simple, with no associated crenulae. (Fig. 34) .................. dama
    Escharae encircled by a row of crenulae .. 22
22. Trumpet long and slender (length/width ratio 9 or greater/1). (Fig. 69) .......... vidamia
    Trumpet shorter and broader (length/width ratio 7 or less/1) ..................... 23
23. Some of scattered crenulae posteromeral to abdominal spiracles arranged into 3-5 short rows. (Fig. 43) ............. lanceolata
Scattered crenulae posteromesal to abdominal spiracles always single, not arranged into short rows. (Fig. 70) .................. nina

Male Genitalia
(Species A Quate and Wirth, doncella and chaborra unknown; spinosa and pilosella excluded for lack of material)

1. Posterior portion of aedeagal sheath triangular in outline. Aedeagal spines monomorphic, all small and slender. Ninth sternite undeveloped. (Fig. 13). Subgenus Acucina ................... 2
   Posterior portion of aedeagal sheath rectangular, petagonal or oval in outline. Aedeagal spines dimorphic, a posterior series of broad, short spines, an anterior and more numerous series of long, slender spines. Ninth sternite well developed, although often weak midventrally. (Fig. 54). Subgenus Maruina .................. 6

Subgenus ACULCINA
2. A pair of posteriorly converging, straplike ventral sclerotizations on venter of posterior portion of aedeagal sheath. (Fig. 13) ....... cholita
   Posterior portion of aedeagal sheath without ventral sclerotizations as above .............. 3
3. Dististyles broad, barely tapering distally ....... 4
   Dististyles strongly narrowed distally ....... 5
4. Aedeagal sheath relatively broad (length/width ratio at widest point 1.0). (Fig. 2) .... amadora
   Aedeagal sheath relatively narrow (length/width ratio at widest point 1.2). (Fig. 15) ......... muchacha
5. Broad sclerotization present in lateral wall of posterior portion of aedeagal sheath. (Fig. 4) .............. amada
   No broad sclerotization present in lateral wall of posterior portion of aedeagal sheath. (Fig. 6) .............. querida

Subgenus MARUINA
6. Posterior portion of aedeagal sheath reinforced with a narrow, transverse, sclerotized arch ... 7
   Posterior portion of aedeagal sheath totally membranous or with broad plates, no narrow, transverse arch ...................... 10
7. Sclerotized arch of aedeagal sheath heavy and straight. Dististyle bipartite. ...... boulderina
   Sclerotized arch of aedeagal sheath narrow and arcuate. Dististyle simple .................. 8
8. Arch constricted mesally. Dististyle ectally angulate. (Fig. 30) .............. chamaca
   Arch not constricted mesally. Dististyle straight or incurved .................. 9
9. Lateral extremes of arch right angulate. Dististyle incurved. (Fig. 27) .......... namorada
   Lateral extremes of arch not angulate. Dististyle straight ...................... pennaki
10. Dististyle bipartite. (Fig. 59) ............ vidamia
   Dististyle simple .................. 11
11. Apex of dististyle bifurcate. (Fig. 57) campesina
   Apex of dististyle simple .................. 12
12. Surstyle stout (length/width ratio 1.5), shorter than dististyle. (Fig. 24) ............ hirta
   Surstyle slender (length/width ratio 4.0 or greater), much longer than dististyle ....... 13
13. Apex of tenaculum with transverse serrations. (Fig. 54) ............ dama
   Apex of tenaculum simple, without serrations .................. 14
14. Base of surstyle swollen. (Fig. 71) ............. nina
   Base of surstyle about same diameter as shaft .................. 15
15. Dististyle broad throughout, ectally arched. (Fig. 48) .............. chica
   Dististyle broad only at base, tapering apically, arching entally .................. 16
16. Dististyle broad (length/width of basal articulation 2.3 or less). (Fig. 45) ......... 17
   Dististyle elongate (length/width of basal articulation 2.8 or greater). (Fig. 39) ...... 18
17. Apex of dististyle acute. Ninth sternite strong and complete mesoventrally. (Fig. 45) garota
   Apex of dististyle obliquely truncate or rounded. Ninth sternite poorly developed, incomplete mesoventrally. (Fig. 74) ...... lanceolata
18. One pair of conspicuously differentiated, major aedeagal spines .............. 19
   Two or more pairs of differentiated, major aedeagal spines .................. 20
19. Major aedeagal spine asymmetrically acuminate. (Fig. 51) ........ cachita
   Major aedeagal spines symmetrically acute. (Fig. 39) ........ bellaca
20. Major aedeagal spines broad, arranged in a longitudinal row (when contracted), diminishing in size anteriorly. (Fig. 66) .......... tica
   Major aedeagal spines long and narrow; all equal in size and arranged in parallel (when contracted). (Fig. 37) .......... chamaquita

Female Genitalia
(muchacha, Species A Quate and Wirth, chamaquita, boulderina, bellaca and campesina unknown; pennaki, spinosa and pilosella excluded for lack of adequate material)
1. Subgenital plate poorly sclerotized and simple, the lateral bristles projecting dorsally from the internal surface of the ventral wall of the plate, not on a lobe. Posterior ends of pontis spermathecae strongly sclerotized and meeting mesally to form a transverse, heavy, continuous, dorsal ridge. (Fig. 5). Subgenus Acucina

2. Subgenital plate well sclerotized and complexly modified, the lateral bristles projecting medially from a distinct, small posterolateral lobe of the plate. Posterior ends of pontis spermathecae variously sclerotized but not meeting mesally to form a ridge as above. (Fig. 55). Subgenus Maruina

Subgenus ACULCINA

2. Dorsoesinal portion of corpus spermathecae modified into a cup-shaped, marginally toothed, projection. (Fig. 5)........................................... 3

3. Dorsoesinal portion of corpus spermathecae not so modified........................................... 4

4. Cornus spermathecae moderately projecting. (Fig. 5)........................................... querida

Cornus spermathecae strongly projecting. (Figs. 3, 5)........................................... amada, amadora

4. Base of lobes of subgenital plate wider than tips of the lobes. (Fig. 16)........................................... doncella

Base of lobes of subgenital plate constricted, narrower than tips of the lobes........................................... 5

5. Depression between lobes of subgenital plate shallow (depth less than width of a lobe at mid-length). (Fig. 22)........................................... chaborra

Depression between lobes of subgenital plate deep (depth greater than width of a lobe at mid-length). (Fig. 14)........................................... cholita

Subgenus MARUINA

6. Fold A of subgenital plate right angulate. A strong, straplike sclerotization at base of cercal lobe below jigulate sclerotization. (Fig. 31)........................................... chamaca

Fold A of subgenital plate a smooth curve or only slightly angulate. Jigulate sclerotization only at base of cercal lobe........................................... 7

7. Lateral portion of margin 1 of subgenital plate produced as a rounded lobe with a reticulate surface. (Fig. 75)........................................... lanceolata

Margin 1 of subgenital plate without lobe laterally as above........................................... 8

8. Margin 1 of subgenital plate folded anteriorly and expanded laterally into a broad lunate lobe. (Fig. 23)........................................... namorada

Margin 1 of subgenital plate straight or evenly curved, not modified as above........................................... 9

9. Depression between lobes of subgenital plate shallow (depth less than width of a lobe at mid-length) ........................................... 13

Depression between lobes of subgenital plate deep (depth greater than width of a lobe at mid-length) ........................................... 10

10. Posterolateral corner of pons spermathecae projecting posteriorly over base of subgenital plate ........................................... 11

Posterolateral corner of pons spermathecae projecting laterally, not over base of the subgenital plate ........................................... 12

11. Margin 2 of subgenital plate a smooth arch. Apex of cornus spermathecae acute and slightly recurved. (Fig. 67)........................................... tica

Margin 2 of subgenital plate with a median lobe. Apex of cornus spermathecae rounded, straight. (Fig. 55)........................................... dama

12. Lobe of subgenital plate tapering posteriorly, narrow (width at mid-length less than 0.5 width of base of lobes). (Fig. 49)........................................... chica

Lobe of subgenital plate broadly rounded, wide (width at mid-length greater than 0.6 width of base of lobes). (Fig. 52)........................................... cachita

13. Lobe of subgenital plate with 3-4 large bristles. (Fig. 25)........................................... hirta

Lobe of subgenital plate with 5 or more large bristles ........................................... 14

14. Base of subgenital plate narrow (approximately same width as lobe). (Fig. 45)........................................... garota

Base of subgenital plate broad (over 2 times the width of a lobe) ........................................... 15

15. Posterolateral corner of pons spermathecae projecting posteriorly above subgenital plate. Apex of cornus spermathecae acute, recurved. (Fig. 72)........................................... nina

Posterolateral corner of pons spermathecae expanded into a broad plate. Apex of cornus spermathecae broadly rounded, straight. (Fig. 60)........................................... vidamia

Subgenus Acucina Hogue, new subgenus

Eight species segregate strongly and consistently from the type species of the genus and its close relatives in my opinion, and constitute a distinct new subgenus. The characteristics which define it are as follows:

DIAGNOSIS AND DESCRIPTIONS

Larva

Hair sp I-VII lateral, contiguous with the pleural hairs.
Pupa
Frontal suture incomplete, not reaching anterior margin of cephalothorax. Anterior region of scutum usually strongly convex by reason of a sharp fold running from the ecdysial suture to the trumpet base. Base of trumpet reinforced with a heavy, sclerotized collar.

Adult, male genitalia
Posterior portion of aedeagal sheath conoid in shape. Aedeagal spines monomorphic, all very short and slender. Ninth sternite not developed.

Adult, female genitalia
Subgenital plate poorly sclerotized and simple, the lateral bristles projecting dorsally from the internal surface of the ventral wall of the plate, not on a lobe.

Type Species
Maruina cholita Hogue, new species

1. Maruina (Aculcina) amadora
Hogue, new species
Figures 1-3, 9

Diagnosis
Larva.—Abdominal segments with two strongly developed lateral projections, an anterior bearing hair sp, the posterior without hairs. Spiniform integumentary tubercles extremely numerous and large. Hair s13 of siphonal complex on an elongate process longer than the hair itself. Pupa.—Trumpet shape capitate, with an undulate pinna that extends proximally to nearly the mid-point of the trumpet shaft.

Adult male.—Antennal flagellar segments 1-7 strongly compressed; a group of elongate, straight, modified scales ventrally on segments 4-7. Adult female.—Indistinguishable from amadora; both possess a cup-shaped, marginally toothed projection on the dorsomesal portion of the cornus spermathecae, and a strongly projecting cornus spermathecae. The former also occurs in querida, but this species has only a moderately projecting cornus spermathecae.

Descriptions
Larva (Fig. 1)
General.—Body form elongate, tapering posteriorly; L/W 3.3.
Size.—Moderate for Maruina. Length 2.5, width 0.7. Head width 0.47. [N = 11].
Pigmentation.—General pigmentation of dorsum even. Tergites all equally well sclerotized, dis-
proportionately large. Platelets sclerotized but obscured by integumentary garniture and overfolding of segment margins.

**Structure.**—Genal angle of head acute, reflexed, sometimes constricted, denticles undeveloped. Integument densely covered laterally with spiniform alveolar processes. Lateral inter-annular incisions distinct only between segments; annular lobes 1 and 2 confluent; lobe 6 (= anterior portion of abdominal segment 1) as well as anterior lobe of each succeeding segment extended laterally as an elongate cylindrical lobe bearing seta pr2; median annulus of each abdominal segment except last produced laterally into an acute, recurved, spiny lobe; posteriormost lobes developed like anterior lobes of segments, bearing two large pleural setae and minute hair sp at its apex. Siphonal segment quadrate in general form, lateral lobes developed, bearing spiniform hair sl3, a small secondary papillate lobe immediately posterior to lateral lobe.

**Chaetotaxy.**—Head: genal hair 1 large, single, hair 3 four branched. Trunk: hairs p3 T-VII and pt2 single, large; latter heavier than former; p1 and mt7 obscured by integumentary garniture. Siphonal segment: hair sl3 on long lobe, spiniform; number of hairs on flabellar lobes: dorsal—15, ventral—49; terminal fringe with 16 hairs.

**Pupa** (Fig. 9)

**Size.**—Moderate for Maruina: overall length 1.8, width 1.2; trumpet length 0.26.


**Structure.**—General shape ovate. Frontal suture incomplete. Scutum without sharp folds anteriorly. Trumpet long (T/BE 1.1); surface reticulo-rugulose; shape irregularly capitulate; base angled, shaft straight; pinna ciliate with 65-75 pairs of rachi. Situation apical, extending proximally on one side to nearly one-half the trumpet shaft.

**Adult male**

**General.**—Eyes approximate, interocular space equal to two facet diameters. Antenna flagellum with 14 segments; segments 1-7 strongly compressed; a group of elongate, straight, modified scales ventrally on segments 4-7.

**Genitalia.**—Fig. 2. Dististyle and basistyle subequal in length; former simple, slightly curved ectally, apex broadly rounded. Basistyle with 45 scales in ventral patch. Aedeagal spines all very short and slender. Posterior portion of aedeagal sheath triangular with a broad, evanescent lunate sclerotization. Subgenital valvule rounded, very prominent.

**Adult female**

**General.**—Eyes approximate, interocular space equal to two facet diameters. Antennal flagellum with 14 segments: segments 1-6 slightly compressed; without specialized scales.

**Genitalia.**—Fig. 3. Laterobasal margin of cercus completely membranous, without straplike sclerotization. Subgenital plate: lobes elongate (interlobular depression very deep), slightly conver-
gent, arising from a broad base. Spermathecal complex: dorsomesal portion of corpus spermathecae modified into a small cup-shaped, marginally toothed projection; surface of posterior portion partially papillate; corni contrary. Postmarginal sclerite broad, becoming very weak laterally.

**Type Material**

**HOLOTYPE ♂ and ALLOTYPE ♀ (both dissected from and mounted with pupal skins): MEXICO, Nayarit State, 20 km W Campostela, 800 m, 24 March 1970 (C. L. Hogue) [LACM].**

4 ♂, 3 ♀ PARATYPES (dissected from and mounted with pupal skins): same data as holotype [LACM, USNM].

**Additional Specimens**

220 larvae, 103 pupae: same data as holotype [LACM].

**ARGENTINA**

**Tucumán Province**

1 larva: Monteros Dept., Quebrada Sosa Ache, 2 October 1950 (P. Wygodzinsky) [AMNH].

All specimens following (collected by C. Hogue) [LACM, USNM]:

**COSTA RICA**

**Alajuela Province**

16 larvae, 3 pupae: Rio Vigia, 0.7 mi W Grecia, 18 June 1972.

**Cartago Province**

14 larvae, 41 pupae and pupal skins: near Tierra Blanca, Quebrada Cañada, 11 June 1972.

1 larva: Quebrada Seco, near Tapantí, 29 June 1972.

**Puntarenas Province**


**San José Province**


2 larvae: Rio Pedregoso, 1.8 mi S San Isidro del General, 28 June 1972.


**Distribution**

Known from Mexico, Costa Rica and Argentina, this species has the widest distribution of any *Maruina.*

**Remarks**

Although some small differences (trumpet shape and number of rachi in pinna) in the pupae exist between the Costa Rican and Mexican populations, the extreme consistency in adult and larval anatomy confirm their conspecificity.

Unfortunately no larvae are available for *amada* and *querida* to confirm it, but *amadora* appears to be closely related to these species on the basis of the common presence of a toothed, cup-shaped structure on the corpus spermathecae in the female genitalia.

2. *Maruina (Acucina) amada*

Hogue, new species

Figures 4-5, 10

**Diagnosis**

Pupa.—Integument of abdominal tergites finely papillate. **Adult male.**—Broad sclerotization present in lateral wall of posterior portion of aedeagal sheath. **Adult female.**—Indistinguishable from *amadora,* both possess a cup-shaped, marginally toothed projection on the dorsomesal portion of the corpus spermathecae, and a strongly projecting cornus spermathecae. The former also occurs in *querida,* but this species has only a moderately projecting cornus spermathecae.

**Descriptions**

**Larva**

Unknown

**Pupa** (Fig. 10)

Size.—Moderate for *Maruina:* overall length 2.0; width 1.3 [N = 6]; trumpet length 0.27.


**Structure.**—General shape ovate. Integument of metascutum and abdominal tergites finely papillate. Frontal suture lacking. Scutum with a sharp fold running from the cedysial suture to the trumpet base. Trumpet long (T/BE 1.4); surface rugose; shape clavate; base angled, shaft straight; pinna apical, cricate with about 20 pairs of rachi.

**Adult male**

**General.**—Eyes approximate, interocular space equal to three facet diameters. Antennal flagellum

Genitalia.—Fig. 4. Dististyle slightly shorter than basistyle; former simple, straight, strongly tapered apically, apex rounded. Basistyle with 25-30 scales in ventral patch. Aedeagal spines all very short and slender. Posterior portion of aedeagal sheath with broad sclerotization in lateral wall. Subgenital valvule broadly rounded, weakly projecting.

Adult female

General.—Eyes approximate, interocular space equal to 5.5 facet diameters. Antennal flagellum with 14 segments; terminal segment small, spherical. Palpal segment proportions 4:6:8:14.5.

Genitalia.—Fig. 5. Laterobasal margin of cercus completely membranous, without straplike sclerotization. Subgenital plate: lobes moderately long (interlobular depression deep), narrowly rounded, divergent, arising from a broad base. Spermathecal complex: dorsomesal portion of corpus spermathecae modified into a large cup-shaped, internally toothed projection; surface of posterior portion finely papillate; corni large, contrary, apices truncate. Postmarginal sclerite very broad.

Type Material

HOLOTYPE ♂, ALLOTYPE ♀ (both dissected from and mounted with pupal skin): COSTA RICA, Puntarenas Prov., Rio Jabá, Las Cruces, rock quarry, 26-27 June 1972 (C. Hogue) [LACM].

♀ (dissected from and mounted with pupal skins) PARATYPES: same data as holotype [LACM, USNM].

Additional Specimens

♀, 6 pupae: same data as holotype [LACM].

COSTA RICA

Cartago Province

♀, 4 ♂: Quebrada Cañada, near Tierra Blanca, 11 June 1972 (C. Hogue) [LACM].

San José Province

1 pupa: Rio General and Pan American Highway, 10 mi S San Isidro del General, 22 June 1972 (C. Hogue) [LACM].

Distribution

Costa Rica

Remarks

Amada apparently is closely related to amadora and querida (see Remarks under amadora).
3. *Maruina (Aculcina) querida*
Hogue, new species
Figures 6-7, 18

**Diagnosis**

*Pupa.*—Integument of abdominal tergites smooth but with strong posteromarginal crenulae. *Adult male.*—Posterior portion of aedeagal sheath totally membranous. Dististyles strongly narrowed distally. *Adult female.*—Like *amada* and *amadora* in possessing a cup-shaped, marginally toothed projection on the dorsomesal portion of the corpus spermathecae but with only a moderately, rather than strongly, projecting cornus spermathecae.

**Descriptions**

**Larva**

Unknown

**Pupa** (Fig. 18)

Size.—Moderate for *Maruina*: overall length 1.8; width 1.2 [N = 3]; trumpet length 0.25.

Pigmentation.—Dorsum evenly dark. Crenulae very strong posteromarginally on metascutum (where also anteromarginal) and all abdominal tergites. Escharae distinct.

Structure.—General shape ovate. Frontal suture incomplete. Scutum with a sharp fold running from the ecdysial suture to the trumpet base. Trumpet long (T/BE 1.25); surface rugulose; shape clavate; base angled, shaft straight; pinna apical, criculate, with 22-24 pairs of rachi.

**Adult male**

General.—Eyes approximate, interocular space equal to four facet diameters. Antennal flagellum with 14 segments, terminal segment small, spherical. Palpal segment proportions 3:5:5:10.

Genitalia.—Fig. 6. Dististyle subequal in length to basistyle; former simple, slightly curved and strongly tapered ectally, apex rounded. Basistyle with 20-22 scales in ventral patch. Aedeagal spines all very short and slender. Posterior portion of aedeagal sheath with vague apicolateral sclerotization. Subgenital valvule rounded, very prominent.

**Adult female**

General.—Eyes approximate, interocular space equal to three facet diameters. Antennal flagellum with 14 segments, terminal segment small, spherical.

Genitalia.—Fig. 7. Laterobasal margin of cercus completely membranous, without straplike sclerotization. Subgenital plate: lobes moderately long (interlobular depression deep), narrowly rounded, subparallel; arising from a broad base.

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**Figures 6-7. Maruina (Aculcina) querida, new species, 6 male genitalia; 7. female genitalia.**
Spermathecal complex: dorsomesal portion of corpus spermathecae modified into a large cup-shaped, internally toothed, projection; surface of posterior portion papillate; corni large, contrary, apices truncate. Postmarginal sclerite very broad, terminating abruptly laterally.

**Type Material**

**HOLOTYPE** δ, **ALLOTYPE** ♀ (♀ dissected from and mounted with pupal skin): COSTA RICA, Puntarenas Prov., Rio Jabá, Las Cruces, rock quarry, 26-27 June 1972 (C. Hogue) [LACM].

2 ♀ **PARATYPES:** same data as holotype.

**Additional Specimens**

8 pupae: same data as holotype.

**COSTA RICA**

**Cartago Province**

1 ♀: Quebrada Cañada near Tierra Blanca, 11 June 1972 (C. Hogue) [LACM].

**Distribution**

Costa Rica

**Remarks**

*Querida* apparently is closely related to *amada* and *amadora* (see remarks under *amadora*).

4. **Maruina (Aculicina) cholita**

Hogue, new species

Figures 8, 11, 13, 14

**Diagnosis**

Larva.—Hair s13 of siphonal complex pedunculate. Hair m₁₆ long and simple. Pupa—Trumpet shape capitate, pinna undulate and extending proximally to about one-third the length of trumpet shaft. The pupa is also covered with a thick waxy substance, which is very noticeable in live and alcohol-preserved specimens. **Adult male.**—A pair of conspicuous, posteriorly converging, straplike ventral sclerotizations on venter of posterior portion of aedeagal sheath. **Adult female.**—Dorsomesal portion of corpus spermathecae without a cup-shaped projection. Subgenital plate constricted basally, depression between the lobes deep.

**Descriptions**

Larva (Fig. 8)

*General.*—Body form elongate; L/W 3.2.

*Size.*—Moderate for *Maruina*. Length 2.7, width 0.9. Head width 0.30.

**Figure 8. Maruina (Aculicina) cholita, new species, larva.**
Pigmentation.—General pigmentation of dorsum even. Tergites all equally well sclerotized except msM which is absent. Platelets generally indistinct.

Structure.—Genal angle of head broadly rounded, denticles undeveloped. Peripheral alveolar processes developed as long denticulate projections on abdominal segments. Lateral interannular incisions shallow on thorax, deeper on abdomen; annular lobes 1 and 2 confluent; lobe 6 (≈ anterior portion of abdominal segment 1) as well as the anterior lobe of each succeeding segment, extending laterally as a short peduncle bearing seta pr2; median annulus of each abdominal segment except last produced laterally into a long recurved, spiny lobe; posteriormost lobes slightly developed. Siphonal segment quadrate in general form, lateral peduncle developed and bearing spiniform hair sl3; a small secondary papillate lobe immediately posterior to lateral lobe.

Chaetotaxy.—Head: genal hair 1 single, hair 3 two branched. Trunk: hairs p3 T-VII and pr2 single, large; latter slightly heavier than former; p1 and mt7 large and single; hairs it P and M apparently missing, hair mt M located on tergite. Siphonal segment: hair sl3 pedunculate, spiniform; number of hairs on flabellar lobes: dorsal—12, ventral—22; terminal fringe with 21 hairs.

Pupa (Fig. 11)

Size.—Moderate for Maruina: overall length 1.95; width 1.3; trumpet length 0.11.


Structure.—General shape elliptical. Frontal suture incomplete. Scutum with a sharp fold running from the ec dysial suture to the trumpet base. Integument covered with a waxy film. Trumpet short (T/BE 0.3); surface rugulose; shape irregularly capitate; base angled, shaft straight; pinna criculate with 55-57 pairs of rachi, situation apical, extending proximally on one side a little more than one-third the trumpet shaft.

Adult male

General.—Eyes approximate, interocular space equal to two facet diameters. Antennal flagellum with 14 segments, terminal segment small and spherical. Palpal segment proportions 4:5:5:11.

Genitalia.—Fig. 13. Dististyle longer than basistyle; former simple, slightly curved ectally, tapered apically, apex rounded. Basistyle with 24-26 scales in ventral patch. Aedeagal spines short and moder-

ately broad. Posterior portion of aedeagal sheath chordate with a pair of posteriorly converging, straplike ventral sclerotizations. Subgenital valve broadly rounded, weakly projecting.

**Adult female**


_Genitalia._—Fig. 14. Laterobasal margin of cercus completely membranous, without straplike sclerotization. Subgenital plate: lobes elongate (interlobular depression deep), broadly rounded, divergent, arising from a broad base. Spermathecal complex: structure typical for subgenus; corni small, apices contrary. Postmarginal sclerite broad.

**Type Material**

_HOLOTYPE_ ♂, _ALLOTYPE_ ♀ (♀ dissected from and mounted with pupal skin): _COSTA RICA_, Parque Nacional de Irazú, tributary to Río Birrís near Park boundary, 11 June 1972 (C. Hogue) [LACM].

16 ♂, 6 ♀ _PARATYPES:_ same data as holotype [LACM, USNM].

**Additional Specimens**

58 larvae, 60 pupae and pupal skins: same data as holotype [LACM, USNM].

_COSTA RICA_

**Puntarenas Province**

1 larva: [Rio Jabá], 5 mi SE San Vito [Las Cruces, rock quarry], 22 March 1967 (R. McDiarmid) [LACM].

**Distribution**

Costa Rica

5. _Maruina (Aculcina) muchacha_

Hogue, new species

Figures 12, 15

**Diagnosis**

_Pupa._—Crenulae on metascutum and abdominal tergite 1 only. Trumpet shape symmetrically capitale with a sinuous pinna extending proximally to a little less than one-half the trumpet shaft. _Adult male._—Somewhat similar to _amadora_ in having a wholly membranous posterior portion of the aedeagal sheath and broad, barely tapering dististyles, but with a relatively narrower (length/width ratio = 1.2) posterior aedeagal sheath portion.

**Descriptions**

_Larva_

Unknown

_Pupa_ (Fig. 12)

_Size._—Moderate for _Maruina:_ overall length 2.1; width 1.5 [N = 6]; trumpet length 0.33.

_Pigmentation._—Dorsum evenly dark. Crenulae present antero- and posteromarginally on metascutum and abdominal tergite I only. Escharae indistinct.

**Figure 15. Maruina (Aculcina) muchacha**, new species, male genitalia.

_Structure._—General shape elliptical. Frontal suture incomplete. Scutum with a sharp fold running from the ec dysial suture to the trumpet base and continuing from trumpet posteriorly to near the tip of the alar sclerite. Trumpet long (T/BE 1.3); surface rugulose; shape symmetrically capitate; base angled, shaft straight; pinna crenulate with about 110-130 pairs of rachi, situation apical, sinuous and extending proximally on both sides to a little less than one-half the trumpet shaft.

**Adult male**

_General._—Eyes approximate, interoculr distance equal to four and one-half facet diameters.
Antennal flagellum with 14 segments, terminal segment small, ovoid.

Genitalia.—Figure 15. Dististyle and basistyle subequal in length; former simple, subbasally angulate octally, apex broadly rounded. Basistyle with 19-22 scales in ventral patch. Aedeagal spines all short and slender. Posterior portion of aedeagal sheath with narrow, evanescent lunate sclerotization. Subgenital valvule truncate, slightly projecting.

Adult female
Unknown

Type Material
HOLOTYPE $\delta$ (dissected from and mounted with pupal skin): COSTA RICA, San José Prov., San Isidro del General, Rio Quebradas, 10 June 1967 (C. L. Hogue, CLH 170A) [LACM].

Additional Specimens
2 pupae: same data as holotype [LACM].
COSTA RICA

Puntarenas Province
1 $\delta$ (dissected from and mounted with pupal skin), 16 pupae: Rio Catarata and Pan American Highway, 23 June 1972 (C. Hogue) [LACM].
1 pupa: Linguita Creek, 1.8 mi W Rincón, Osa Peninsula, 8, 13 April 1971 (C. Hogue) [LACM].

Distribution
Costa Rica

6. Maruina (Aculcina) Species A Quate and Wirth
Figure 19

Maruina species A Quate and Wirth, 1951: 162.

Recognition
Pupa.—Trumpet shape clavate, pinna straight, mostly apical with 25-30 pairs of rachi.

Description
Larva
Unknown

Pupa (Fig. 19)
Size.—Moderate for Maruina: overall length 2.2; width 1.9 [N = 3]; trumpet length 0.33.

Pigmentation.—Dorsum dark centrally, gradually paler peripherally. Crenulae totally absent (a faint anteromarginal series on metascutum). Escargae distinct.

Structure.—General shape elliptical. Frontal suture incomplete. Integument of abdominal tergites longitudinally creased or wrinkled. Trumpet long (T/BE 1.5); surface rugose; shape clavate; base straight but constricted, shaft straight; pinna apical, craticulate with 25-30 pairs of rachi.

Adult male and female
Unknown

Material
6 pupae: MEXICO, Contreras, near Mexico City, 1947 (Hecht) [USNM]. Part of a series of 13 pupae.

Distribution
Central Mexico

Remarks
I have seen six pupae from the 13 available to Quate and Wirth and found one containing a fairly well-developed adult male from which I could determine the close relationship of this species to others in the subgenus Aculcina. It is not possible to see clearly sufficient detail to properly diagnose and describe it.

Although this entity is not named because of the lack of adults, there is no question of its distinctness. The pupae of all other Aculcina are known and from all of these species A is clearly separable.

7. Maruina (Aculcina) doncella
Hogue, new species
Figures 16, 20

Diagnosis
Pupa.—Very similar to Species A Quate and Wirth, both having a clavate trumpet but with a longer pinna (approximately 50 pairs of rachi compared to 25-30). Adult female.—Lacking a cup-shaped projection on the dorsomesal portion of the corpus spermaticum and with a very broad based subgenital plate (wider than tips of lobes).

Descriptions
Larva
Unknown

Pupa (Fig. 20)
Size.—Moderate for Maruina: overall length 2.1; width 1.6 [N = 1]; trumpet length 0.33.

Pigmentation.—Dorsum of cephalothorax evenly dark; abdominal tergites 1-V with distinctly

Structure.—General shape ovate. Frontal su-
ture incomplete. Integument of abdominal tergites
longitudinally creased or wrinkled. Trumpet long
(T/BE 1.3); surface rugose; shape clavate; base
angled slightly, shaft straight; pinna ciliate with
50 pairs of rachis, situation obliquely apical, extend-
ing proximally to about one-half the trumpet shaft.

Adult male
Unknown

Adult female

General.—Eyes approximate, interocular dis-
tance equal to one facet diameter. Antennal flagel-
lum with 14 segments, terminal segment small,
spherical.

Quebrada de los Sosa Acheral, 2 October 1950 (P.
Wygodzinsky) [AMNH].

Additional Specimens
3 pupae: same data as holotype [AMNH].

Distribution
Andean Argentina

8. Maruina (Aculcina) chaborra
Hogue, new species
Figures 17, 21-22

Diagnosis
Larva.—Hair sl3 of siphonal complex large and
heavy, sessile. Hair mt6 short, branched. Pupa.—
Crenulae of abdominal tergites very conspicuous
and delineating large quadrate areas. Adult female.
—Cup-shaped modification of dorsomesal portion
of corpus spermathecae absent. Base of subgenital
plate narrow, interlobular depression shallow.

Descriptions
Larva (Fig. 17)

General.—Trunk form elongate; L/W 2.8.
Size.—Large for Maruina. Length 2.9, width
1.0. Head width 0.41 [N = 1].

Pigmentation.—General pigmentation of dor-
sum even. Tergites all equally well sclerotized (ex-
cept ms M which is absent?). Platelets indistinct.

Structure.—Genal angle of head broadly acute,
denticles undeveloped. Peripheral alveolar processes
undeveloped except on annulus 25. Lateral inter-
annular incisions shallow, forming only slightly
convex lobes; posteriormost lobe undeveloped. Si-
phonal segment quadrato in general form, rounded
posteriorly.

Chaetotaxy.—Head: genal hairs 1 and 3 mul-
branched. Trunk: hairs p3 TVI and p2r single,
large and subequal; p1 and mt7 small, branched,
p1 M and T ventral; hair apparently missing on
thorax. Siphonal segment: hair sl3 heavy, sessile;
number of hairs on flabellar lobes and terminal
fringe not determinable from single available speci-
men.

Pupa (Fig. 21)

Size.—Large for Maruina: overall length 2.3;
width 1.6 [N = 8]; trumpet length 0.30.

Pigmentation.—Dorsum evenly dark. Crenulae
strongly developed on cephalothorax and abdomen,
on abdominal tergites forming three series of quad-
rate areas: a submesal series of closed rectangles,
a lateromedian series of laterally open rectangles
(surrounding escharae) and a lateral series (also
open laterally). Escharae distinct.
Figure 17. Maruina (Aculcisa) chaborra, new species, larva. See p. 3 and section on Anatomy and Taxonomic Characters, larva, for explanation of abbreviations.
Structure.—General shape ovate. Frontal suture incomplete. Trumpet long (T/BE 1.3); surface rugose; shape clavate, base angled, shaft straight; pinna apical, cuncate, arcuate, with 21-26 pairs of rachi.

Adult male
Unknown

Adult female

General.—Eyes nearly contiguous (rims touching, but median facets separated by a space equal to two facet diameters). Antennal flagellum probably with 14 segments (material incomplete).

Genitalia.—Fig. 22. Laterobasal margin of cercus completely membranous, without straplike sclerotization. Subgenital plate: area immediately surrounding lateral bristles pigmented; lobes short (interobular depression shallow), arising from a broad base. Spermathecal complex: entire structure smaller, relative to rest of genitalia, than other species; corni small, contrary, apices rounded. Post-marginal sclerite broad.

Type Material
HOLOTYPE ♂ (dissected from and mounted with pupal skin): COLOMBIA, Boyacá Dept., Valley of the Rio Pomeca, NW Arcabuco, 2400 m, 9 July 1967 (P. Wygodzinsky) [AMNH].
3 ♀ PARATYPES (dissected from and mounted with pupal skins): same data as holotype [AMNH-2, LACM-1].

Additional Specimens
1 larva, 7 pupae: same data as holotype [AMNH, LACM].

Distribution
Andean Colombia

Subgenus MARUINA Müller
The majority of the known species fall into this group, sharing the following characteristics in the three stages.

Diagnosis and Description
Larva
Hair sp I-VII ventral, detached mesally from the pleural hairs.

Pupa
Frontal suture complete, i.e. reaching anterior margin of the cephalothorax. Anterior region of scutum shallowly and evenly convex. Base of trumpet usually simple, a membranous articulation set in a simple orifice (heavy collar in only one species).

Adult, male genitalia
Posterior portion of aedeagal sheath rectangular, pentagonal or oval. Aedeagal spines di- or trimorphic, those of the anterior series very long and slender, the posterior ones much heavier and shorter than the anterior. Ninth sternite well developed.

Adult, female genitalia
Subgenital plate well sclerotized and complexly modified: Margin 1 usually a smooth arc, 2 a straight transverse line, 3 angling directly between the pugio and anterolateral corner of the plate; folds A and C arcuate, B straight and external to base of subgenital plate; lateral bristles projecting medially from a distinct, small, posterolateral lobe.

Type Species
Maruina piloseila Müller, automatic for nominate subgenus.

9. Maruina (Maruina) hirta
Johannsen
Figures 23-25, 63


Figure 22. Maruina (Aculcina) chaborra, new species, female genitalia.
Figure 23. *Maruina* (M.) *hirta* Johanssen, larva.

RECOGNITION

Larva.—Elongate body shape. Hairs p3 M-VIII and pr2 I-VII with numerous dendritic branches. Pupa.—Trumpet smooth, with few rachi. Ctenulae absent from scutum and abdominal tergites (faintly evident along posterior margins of latter). Adult male.—Surstyle very short (length/width ratio = 1.5). Adult female.—Depression between lobes of subgenital plate shallow; individual lobe with only 3-4 large bristles.

DESCRIPTIONS

Larva (Fig. 23)

General.—Trunk form elongate.
Size.—Specimens not measured.
Pigmentation.—General pigmentation of dorsum even. Tergites all equally well sclerotized. Platelets distinct.
Structure.—Genal angle of head broadly rounded, with rounded tubercles. Peripheral alveolar processes conspicuous and long only on abdominal segments. Lateral interannular incisions shallow forming moderately convex lobes, posteriormost lobe undeveloped. Siphonal segment quadrangular in general shape, narrowing posteriorly.

Chaetotaxy.—Head: genal hair 1 single, hair 3 multibranched, small. Trunk: hairs p3 T-VII and pr2 multibranched, dendritic; p1 and m17 minute, single. Siphonal segment: hair sl3 normal; number of hairs on flabellar lobes and in terminal fringe not counted.

Pupa (Fig. 63)

Size.—Moderate for Maruina: overall length 1.8; width 1.2 [N = 1]; trumpet length 0.15.

Pigmentation.—Dorsum evenly dark. Ctenulae weak posteromarginally on abdominal tergites. Escharae indistinct.

Structure.—General shape elliptical. Frontal suture complete. Trumpet moderately long (T/BE 0.8); surface smooth; shape subfusiform, base and shaft straight; pinna apical, with a few rachi.

Adult male

General.—Not ascertainable from material.
Genitalia.—Fig. 24. Surstyle very short (L/W about 1.5), tenaculum curved and with a striated apex. Dististyle slightly shorter than basistyle; former simple, straight, with a rounded apex. Basistyle with no scales. Major aedeagal spines not well differentiated from minor, major shorter and slightly curved. Posterior portion of aedeagal sheath membranous. Subgenital valvule rounded in outline. Ninth sternite incomplete mesally.

Adult female

General.—Not ascertainable from material.

Genitalia.—Fig. 25. Laterobasal margin of cercus without straplike sclerotization. Subgenital plate: basic form not specially modified from that described for subgenus; lobes short (interlobular depression very shallow), broadly rounded, arising from a broad base. Spermathecal complex: posterolateral corner of pons spermathecae projecting laterally, not over base of subgenital plate; corni contrary, apices broadly rounded. Postmarginal sclerite not determinable from available material.

Material

The type series which I was able to examine is still the only material available.

Distribution

Puerto Rico

Remarks

The type material is in fairly good condition and permitted a nearly full diagnosis. The uniquely short dististyles, unscaled basistyle and monomorphic adeagal spines in the male genitalia plus the dendritic lateral hairs of the larva isolate *hirta* phyletically from all other *M. (Maruina).* It is the only insular species, which may account for these structural deviations.

10. *Maruina (Maruina) namorada*

Hogue, new species

Figures 26-28, 62

Diagnosis

Larva.—Similar to *chamaca.* Body shape oval. Abdominal segments strongly lobed laterally; posteriormost lobes long; anteriormost lobe not developed. Hair pr2 I-VII one to two branched. *Pupa.—*Trumpet entirely absent, basal tracheal branch atrophied. Adult male.—Posterior portion of adeagal sheath reinforced with a narrow, transverse, straight, sclerotized arch. Dististyle simple. Adult female.—Margin 1 of subgenital plate folded anterioially and expanded laterally into a broad lunate lobe.

Descriptions

Larva (Fig.26)

General.—Trunk form oval; L/W 2.0.

Size.—Small for *Maruina.* Length 2.1, width 1.1. Head width 0.33.

Pigmentation.—General pigmentation forming an extremely variable light and dark pattern on dorsum: ranges from almost completely dark dor-

sum to largely pale; varying intermediate patterns with dark area extensive over median majority of dorsum, pale patches laterally on anterior annulus of each segment or with pale areas more extensive, extending onto lateral extremities of median annuli as well as anterior and an isolated pale spot appearing submesally on segments III and IV. Teriges all equally well sclerotized. Platelets distinct.

Structure.—Genal corner of head angulate, with conspicuous denticles. Peripheral alveolar processes of long denticulate projections complete on all trunk segments. Lateral interannular incisions moderately deep, forming broad truncate or bilobed lobes; posteriormost lobe with oblique apex, posterior angle acute, projecting to midlength of siphonal segment. Siphonal segment quadrate in general shape.

Chaetotaxy.—Head: genal hair 1 three branched, hair 3 large, multibranched. Trunk: hairs p3 I-VII single, subequal to p6; pr2 one to two branched; p1 and mt7 small, single; it I-VI on margin of mesotergite. Siphonal segment: hair 1sl normal; number of hairs on flabellar lobes: dorsal—5, ventral—20; terminal fringe with 7 hairs.

*Pupa* (Fig. 62)

Size.—Moderate for *Maruina*: overall length 1.9; width 1.2 (N = 9); trumpet absent.

Pigmentation.—Dorsum evenly dark. Crenulae distinct antero- and posteromarginally on abdominal tergites, crenular units separated (series open or broken), incomplete laterally. Eschareae distinct.

Structure.—General shape elliptical. Frontal suture complete. Trumpet entirely absent, basal tracheal branch atrophied.

Adult male

General.—Eyes disjunct, interocular distance equal to seven facet diameters. Antennal flagellum with 14 segments, terminal segment subequal to subterminal.

Genitalia.—Fig. 27. Surstyle elongate, tenaculum typical. Dististyle longer than basistyle; former simple, curved entally, apex narrowly rounded. Basistyle with 17-19 scales in ventral patch. Adeagal spines dimorphic: a pair of curved major spines in addition to long, slender, acicular minor spines. Posterior portion of adeagal sheath with a narrow, transverse sclerotized arch near apex. Subgenital valvule moderately prominent, truncate, outer angles obtuse. Ninth sternite complete.

Adult female

General.—Eyes disjunct, interocular distance equal to eight facet diameters. Antennal flagellum with 14 segments, terminal segment small, ovoid.
Figure 26. Maruina (M.) namorada, new species, larva.
**Genitalia.**—Fig. 28. Laterobasal margin of cercus without straplike sclerotization. Subgenital plate: margin I folded anteriorly and expanded laterally into a broad, lunate lobe; fold A arcuate; lobes short (interlobular depression shallow), divergent, broadly rounded, arising from a moderately narrowed base. Spermathecal complex: postero-lateral corners of pons spermathecae projecting posteriorly, over base of subgenital plate; corni slightly divaricate, intercorneal angle approximately 170 degrees, apices oblique. Postmarginal sclerite broad.

**Type Material.**

**HOLOTYPE** ♀ and **ALLOTYPE** ♂ (♂ dissected from and mounted with pupal skin): BRAZIL, Rio de Janeiro State, Parque Nacional do Itatiaia, Rio Campa Bello, 500 m, 26-28 November 1970 (C. L. Hogue, D. B. Bright, J. Guimarães) [MSP].

4 ♂, 8 ♀ **PARATYPES** (part dissected from and mounted with pupal skins): same data as holotype [MSP, LACM].

**Additional Specimens**

582 larvae, 658 pupae, 67 ♀: same data as holotype [MSP, LACM].

**BRAZIL**

**Rio de Janeiro State**

2 ♂, 22 ♀: Municipio Rezende, Fazenda Peuedo, March 1947 (S. J. de Oliveira) [USNM].

**Distribution**

Southeastern Brazil

**Remarks**

Although namorada shows affinities with chamaica, chamaquita, boulderina and pennaki, principally in the common possession of a sclerotized arch in the posterior portion of the aedeagal sheath, it stands apart from them and alone from all Maruina in the complete lack of a pupal trumpet and the associated atrophy of the tracheal trunk at its base (except in an undescribed Costa Rican species, excluded from this paper until it can be studied further).

11. **Maruina (Maruina) chamaica**

Hogue, new species

Figures 29-32

**Diagnosis**

**Larva.**—Most similar to namorada. Body shape oval. Abdominal segments strongly lobed laterally;
Figure 29. *Maruina* (M.) *chamaca*, new species, larva.
posteriormost lobes long; anteriormost lobe not developed. Hair pr2 I-VII three to five branched. 

**Pupa.**—Trumpet with an acute apex; pinna represented by a simple subapical pore (flush with the surface or on a slight elevation). **Adult male.**—Posterior portion of aedeagal sheath reinforced with a narrow, transverse, horseshoe-shaped arch. Dististyle simple. **Adult female.**—Fold A of subgenital plate right angulate. A strong, straplike sclerotization at base of cercal lobe below ligulate sclerotization. Base of subgenital plate very narrow.

**Descriptions**

**Larva** (Fig. 29)

**General.**—Trunk form oval, very flat and wide; L/W 1.8.

**Size.**—Large for *Maruina*. Length 2.9, width 1.7. Head width 0.45.

**Pigmentation.**—General pigmentation of dorsum even. Tergites all equally well sclerotized. Platelets distinct.

**Structure.**—Genal angles of head right angled, rounded. Peripheral alveolar processes of elongate, denticulate projections, completely fringing trunk segments. Lateral interannular incisions very deep, forming elongate lobes; posteriormost lobe equally biramous, projecting past midlength of siphonal segment. Siphonal segment equi-rectangular in general shape.

**Chaetotaxy.**—Head: genal hair 1 five branched, hair 3 multibranched, large. Trunk: hairs p3 T-VII one (rarely two) branched; pr2 three to four branched; hairs p1 and mt7 small, branched. Siphonal segment: hair sl3 normal; number of hairs on flabellar lobes: dorsal—7, ventral—23; terminal fringe with 12 hairs.

**Pupa** (Fig. 32)

**Size.**—Large for *Maruina*: overall length 2.3; width 1.8; trumpet length 0.16.

**Pigmentation.**—Dorsum evenly dark. Crenulae indistinct except for a strong series on scutum parallel to the parafrontal suture and an isolated arcuate series on scutum.

**Structure.**—General shape elliptical, almost circular. Frontal suture complete. Trumpet short (T/B 0.6); surface smooth; shape compressed lanceolate, apex slightly curved; base and shaft straight; pinna a simple pore about one-third the length from the apex; opening flush with the surrounding surface or on a raised, deeply pigmented tubercle.

**Adult male**

**General.**—Eyes disjunct, interocular distance equal to eight facet diameters. Antennal flagellum with 14 segments, terminal segment subequal to subterminal.

**Genitalia.**—Fig. 30. Surstyle elongate, tenaculum typical. Dististyle length equal to that of basistyle; former angled abruptly ectally and narrowed beyond middle; apex narrowly rounded. Basistyle with 30-37 scales in ventral patch. Aedeagal spines dimorphic: three to four pairs of major aedeagal

**Figures 30-31. Maruina (M.) chamaca, new species, 30. male genitalia; 31. female genitalia.**
spines; minor spines long and slender, acicular. Posterior portion of aedeagal sheath with a conspicuously strong, horseshoe-shaped subapical sclerotization, a constriction at the middle of the bridge. Subgenital valve prominent, truncate, outer angles obtuse. Ninth sternite incomplete mesally.

**Adult female**

*General.*—Eyes disjunct, interocular distance equal to ten facet diameters. Antennal flagellum with 14 segments, terminal segment diminutive.

*Genitalia.*—Fig. 31. Laterobasal margin of cercus with a strong straplike sclerotization. Subgenital plate: basic form not especially modified from that described for subgenus; lobes elongate (interlobular depression deep), strongly divergent, slightly incurving, apices rounded, arising from a very narrow base giving entire plate a petiolate appearance. Spermathecal complex: posterolateral corner of pons spermathecae projecting laterally, not over base of subgenital plate; corni divaricate, intercornal angle approximately 135 degrees, apices rounded. Postmarginal sclerite narrow.

**Type Material**

*HOLOTYPE* ♂ and *ALLETYPE* ♀ (both dissected from and mounted with pupal skins): COSTA RICA, San José Prov., Río Quebradas, San Isidro del General, 10 June 1967 (C. L. Hogue, CLH 170A) [LACM].

7 ♂, 7 ♀ *PARATYPES* (part dissected from and mounted with pupal skins): same data as holotype [LACM, USNM].

**Additional Specimens**

345 larvae, 149 pupae: same data as holotype [LACM, USNM].

All specimens following, unless noted otherwise, (collected by C. Hogue) [LACM]:

**COSTA RICA**

*Alajuela Province*

23 larvae, 3 pupae: Río Vigia, 0.7 mi W Grecia, 18 June 1972.

1 ♂: Higuito, San Mateo, no date (P. Schild) [USNM].

*Cordoba Province*

1 ♂, 227 larvae, 2 pupae: Quebrada Seco, near Tapantí, 29 June 1972.

**Puntarenas Province**

91 larvae, 10 pupae: Osa Peninsula, Quebrada Agua Buena, 1.8 mi W. Rincón, 1 March, 14 April 1971.

42 larvae, 82 pupae: Río Aranjuez and Pan American Highway, 18 June 1972.

15 larvae: Río Barú at Barú, 28 June 1972.

93 larvae, 3 pupae and pupal skins: Río Cañablanca and Pan American Highway, 23 June 1972.

31 larvae, 8 pupae: Río Catarata and Pan American Highway, 23 June 1972.

1 pupa: Río Cireulas and Pan American Highway, 14 June 1972.

52 ♂, 158 larvae, 139 pupae and pupal skins: Río Convento and Pan American Highway, 22 June 1972.


17 larvae, 1 pupa: Río Lopez and Pan American Highway, 23 June 1972.


21 larvae, 8 pupae: Río La Vieja and Pan American Highway, 23 June 1972.

**San José Province**

1 ♀, 177 larvae, 51 pupae and pupal skins: Río Cajón and Pan American Highway, 22 June 1972.

276 larvae, 45 pupae and pupal skins: Río General and Pan American Highway, 10 mi S San Isidro del General, 22 June 1972.

41 larvae: Río Pedregoso, 1.8 mi S San Isidro del General, 28 June 1972.


296 larvae, 70 pupae and pupal skins: Río Quebradas, San Isidro del General, 21 June 1972.

251 larvae: Río Trojas?, 2 mi W Grecia, 18 June 1972.

251 larvae, 142 pupae and pupal skins: Río Unión and Pan American Highway, 22 June 1972.

**MEXICO**

**Nayarit State**

52 larvae, 13 pupae, 1 ♂, 2 ♀: 20 km W Campoamor, 800 m, 24 March 1970.

**Distribution**

Central Mexico, Costa Rica

**Remarks**

The Mexican population which differs in minor, but consistent, respects from the Costa Rican (shapes of larval lobes and siphonal segment, raised rather than flush pinnal pore on the pupal trumpet) may be indicative of a geographic race worthy of
FIGURES 32-35. Marsina (M.) pupae, dorsal aspect, left, enlargement of trumpet, right. 32. chamaca, new species; 33. cachita, new species; 34. dama, new species; 35. tica, new species.
subspecific recognition. Material from intermediate localities is needed to evaluate the nature of variation in these characteristics.

*Chamaea* shows affinities with *chamaquila*, *namorada*, *boulderina* and *pennaki* (see Remarks under *namorada*).

12. *Maruina (Maruina) chamaquila*
Hogue, new species
Figures 35-37, 64

**Diagnosis**

*Larva.*—Abdominal segments strongly lobed laterally; posteriorly directed lobes of annulus 25 and anteriorly directed lobes of annulus 1 strongly developed, similar in shape and size. *Pupa.*—Apex of trumpet strongly curved anteriorly or uncinate; pinna absent. *Adult male.*—Three pair of major aedeagal spines, all long and narrow and arranged in parallel. Dististyle elongate (length/width ratio greater than 2.8).

**Descriptions**

*Larva* (Fig. 36)

**General.**—Trunk form oval, very flat and wide; L/W 1.6.

**Size.**—Moderate for *Maruina*. Length 2.5, width 1.5. Head width 0.35 [N = 3].

**Pigmentation.**—General pigmentation of dorsum even. Tergites all equally well sclerotized. Platelets distinct.

**Structure.**—Genal angle of head acute, smooth. Peripheral alveolar processes of elongate, fringed projections complete on all trunk segments. Lateral interannular incisions deep, forming elongate, truncate lobes; posteriormost lobe with oblique apex, posterior angle acute, projecting past mid-length of siphonal segment. Siphonal segment generally small, a quadrangular trapezoid in general shape.

**Chaetotaxy.**—Head: genal hair 1 single, hair 3 multibranched, large. Trunk: hairs p3 T-VII two to four branched; p2 two to three branched; p1 and m7 small and branched. Siphonal segment: hair s13 normal; number of hairs on flabellae lobes: dorsal—9, ventral—28; terminal fringe with 7 hairs.

*Pupa* (Fig. 64)

**Size.**—Moderate for *Maruina*: overall length 2.0; width 1.5 [N = 5]; trumpet length 0.19.


**Structure.**—General shape elliptical. Frontal suture complete. Trumpe: moderately long (T/BE

**Figure 37. Maruina (M.) chamaquila, new species, male genitalia.**

0.9); surface smooth; shape cylindrical with attenuo-uncinate (curved anteriorly) apex; base and shaft straight; pinna absent.

**Adult male**

**General.**—Eyes disjunct, interocular space equal to nine facet diameters. Antennal flagellum with 14 segments, terminal segment equal to sub-terminal.

**Genitalia.**—Fig. 37. Surname elongate, tenaculum typical. Dististyle length equal to that of basty-style; former simple, narrow, elongate, slightly curved mesally, apex acute. Basistyyle with 27-32 scales in ventral patch. Aedeagal spines dimorphic: three pairs of major aedeagal spines (two clearly visible in ventral aspect) subequal in size and shape, all elongate, straight and subparallel; minor spines long and slender, aciculare. Posterior portion of aedeagal sheath lightly sclerotized laterally. Subgenital valvule moderately prominent, outer angles rounded, obtuse. Ninth sternite complete.

**Adult female**

Unknown

**Type Material**

*HOLOTYPUS* & (dissected from and mounted with pupal skin): COSTA RICA, Guanacaste Prov.,Rio Corobicí and Pan American Highway, Finca La Pacifica, 12 February 1969 (C. L. Hogue, CLH 221) [LACM].
ADDITIONAL SPECIMENS
9 larvae, 4 pupae: same data as holotype [LACM].
COSTA RICA
Guatemala Province
1 pupa: Rio Lajas and Pan American Highway, 15 June 1972 (C. Hogue) [LACM].
Puntarenas Province
143 larvae, 5 pupae: Osa Peninsula, Llinquita Creek and Quebrada Agua Buena, 1.8 mi W Rincon, 8-14 April 1971 (C. L. Hogue) [LACM].
1 pupa: Quebrada Saltó, near Barú, 28 June 1972 (C. Hogue) [LACM].
San Jose Province
5 larvae: Rio Quebradas, San Isidro del General, 10 June 1967 (C. L. Hogue, CLH 170A) [LACM].

DISTRIBUTION
Costa Rica

REMARQUES
The relationship of this species to chamaca, namorada, pennaki, and boulderina has already been mentioned (see remarks under namorada).

13. Maruina (Maruina) boulderina
Vaillant
Not figured


RECOGNITION
Larva.—Body form elongate-oval. Lobe of annulus I undeveloped. Posteriorly directed lobe of annulus 25 short, divergent. Siphonal segment trap-

Pupa.—Trumpet very small and straight. Lateromarginal crenulae of abdominal tergites absent. Adult male.—Posterior portion of aedeagal sheath with a narrow, transverse, sclerotinized arch. Dististyle bipartite.

DESCRIPTIONS
Since I have not had access to any material, these redescriptions of boulderina are based entirely on those of Vaillant, and therefore are incomplete.

Larva (See Vaillant, 1963b: pl. 3, figs. a-1; pl. 4, figs. a-g)
General.—Trunk form elongate-oval.
Size and pigmentation.—Not determinable from Vaillant's description.
Structure.—Genal angles of head angulate, denticles well developed. Peripheral alveolar processes developed as acute denticles anteriorly, long fringed projections posteriorly. Lateral interannular incisions shallow, forming low rounded lobes; posteriorly most lobe short, diverging from siphonal seg-

Chaetotaxy.—Head: genal hair 1 single. Trunk: hairs p3 P-M single, I-VII multibranchied; pr2 (Vaillant’s “a1”) five to six branched; p1 and mt7 small and single. Siphonal segment: hair sl3 normal.

Pupa (See Vaillant, 1963b: pl. 5, figs. a-c)
Size.—Moderate for Maruina: overall length 2.2; width 1.4 [measured from Vaillant's plate 5, fig. 2]; trumpet length not determinable.
Pigmentation.—Crenulae present on anterior and posterior margins of abdominal tergites. Escharae distinct, encircled by crenulae.
Structure.—General shape elliptical. Frontal suture?, undoubtedly complete. Trumpet very short (T/BE 0.3); surface smooth; shape clavate; base and shaft straight; pinna apical with very few rachi.

Adult male (See Vaillant, 1963b: pl. 2, figs. f-i)
General.—Antennal flagellum with 14 seg-


Adult female
Unknown

MATERIAL
None

DISTRIBUTION
Colorado, U.S.A.
Remarks
On the basis of the transverse sclerotized arch in the posterior portion of the aedeagal sheath, boulderina and pennaki appear closely related to each other and to chamaca, chamaquita and namorada. The last three, however, have deeply lobed larvae and would appear to have closer affinities among themselves than to the former pair (see Remarks under namorada).

14. Maruina (Maruina) pennaki Vaillant
Not figured


Recognition
Larva.—Body form elongate-oval. Lobe of annulus I small, not directed anteriorly, of annulus 25 small, adnate to siphonal segment. Siphonal segment subcircular. Pupa.—Trumpet shape clavate, apex darkly pigmented, pinna obliquely apical, with 10 pairs of rachi. Crenulae distinct on scutum and abdominal tergites. Adult male.—Posterior portion of aedeagal sheath with a transverse sclerotized arch. Dististyle straight. Adult female.—Insufficient material.

Descriptions
Since I have not had access to any material, these redescriptions of pennaki are based entirely on those of Vaillant (1963b) and therefore are incomplete.

Larva (See Vaillant, 1963b: pl. 3, figs. m-s; pl. 4, figs. h-m)
General.—Trunk form elongate-oval.
Size and pigmentation.—Not determinable from Vaillant’s description.
Structure.—Genal angles of head right angulate, denticles minute. Peripheral alveolar processes developed as acute denticles anteriorly, long fringed projections posteriorly. Lateral interannular incisions moderately deep forming prominent lobes; posteriormost lobe short, adnate to siphonal segment. Siphonal segment subcircular.
Chaetotaxy.—Head: genal hair 1 single. Trunk: hairs p3 P-M single, I-VII multibranched; p2 (Vaillant’s “a1”) five to seven branched; p1 and mt7 small and single. Siphonal segment: hair sl3 normal.

Pupa (See Vaillant, 1963b: pl. 5, figs. d-i)
Size.—Moderate for Maruina: overall length and width not determinable. Trumpet length not determinable.
Pigmentation.—Crenulae present on anterior and posterior margins of abdominal tergites. Escharae distinct, encircled by crenulae. Apex of trumpet distinctly dark pigmented.
Structure.—General shape, frontal suture, undoubtedly completely. Trumpet moderately long (T/BE 0.8; surface smooth, shape clavate; base straight, shaft slightly curved; pinna obliquely subapical, with 10 pairs of rachi.

Adult male (See Vaillant, 1963b: pl. 1, figs. g-i; pl. 2, figs. j-l)
Genitalia.—Description derived from Vaillant. Surstyle elongate, tenaculum typical. Dististyle slightly shorter than basistyle; former simple, slightly curved entally, apex acute. Basistyle with 17 scales in ventral patch. Major aedeagal spines not well differentiated from minor. Posterior portion of aedeagal sheath with a narrow, transverse, sclerotized arch subapically. Subgenital valvule prominent, truncate. Ninth sternite complete mesally.

Adult female (See Vaillant, 1963b: pl. 1, figs. j-l)
General.—Antennal flagellum with 14 segments. Proportions of palpal segments 34:36:46:64.
Genitalia.—Not figured, description derived from Vaillant. Sclerotizations at base of cercus and postmarginal sclerite not determinable. Subgenital plate: lobes elongate (interlobular depression deep), apices rounded, arising from a moderately narrow base. Spermathecal complex: details not determinable; corni contrary, apices rounded.

Material
None

Distribution
Colorado, U.S.A.

Remarks
This species is closely related to boulderina and to chamaca, chamaquita and namorada (see remarks under namorada and boulderina).
Figure 38. *Maruina (M.) bellaca*, new species, larva.
15. *Maruina (Maruina) bellaca*
Hogue, new species
Figures 38-39, 41

*Maruina pilosella* of Quate and Wirth, 1951.

**Diagnosis**


**Description**

*Larva* (Fig. 38)

*General.*—Trunk form elongate-oval; L/W 2.8.

*Size.*—Large for *Maruina*. Length 3.0, width 1.1. Head width 0.39 [N = 3].

*Pigmentation.*—General pigmentation forming a light and dark pattern on dorsum: pale on thorax and peripherally on abdomen except anterior annuli which are entirely contrasting dark like median zone. Tergites all equally well sclerotized except those of segments IV and V which are distinctly paler. Platelets distinct.

*Structure.*—Genal angle of head acutely rounded, denticles well developed. Peripheral alveolar processes developed as long, denticulate projections fringing all segments. Lateral inter-annular incisions shallow, forming moderately convex lobes; posteriormost lobe moderately developed, acutely rounded. Siphonal segment quadrangulate, narrowed and rounded posteriorly, pleuron convex.

*Chaerotaxy.*—Head: genal hair 1 two branched, hair 3 multibranched. Trunk: hairs p3 T-VII three to five branched; pr2 four to six branched; p1 and mt7 small and branched, except p1 VII which is single. Siphonal segment: hair s13 normal; number of hairs on flabellar lobes: dorsal—11, ventral—25; terminal fringe with 11 hairs.

*Pupa* (Fig. 41)

*Size.*—Moderate for *Maruina*: overall length 2.1; width 1.4 [N = 1]; trumpet length 0.09.

*Pigmentation.*—Dorsum evenly dark. Crenulae conspicuous on scutum and on all margins of the metascutum and abdominal tergites. Escharae distinct.

*Structure.*—General shape elliptical. Frontal suture complete. Trumpet very short (T/BE 0.4); surface rugulose; shape ovoid, recumbent posteriorly; base strongly angled, shaft straight; pinna apical, with 8-10 radially arranged rachi.

**Figure 39. Maruina (M.) bellaca, new species, male genitalia.**

**Adult male**

*General.*—Eyes disjunct, interocular space equal to seven facet diameters. Antennal flagellum with 14 segments, terminal segment subequal to subterminal.

*Genitalia.*—Fig. 39. Surstyle elongate, tenaculum missing from specimen. Dististyle length subequal to that of basistyle; former simple, straight, apex narrowly rounded. Basistyle with 28 scales in ventral patch. Aedeagal spines dimorphic: a distinctive pair of broad, major spines in addition to numerous long, slender, acicular minor spines. Posterior portion of aedeagal sheath with broad, light, lateral sclerotizations. Subgenital valvule prominent, truncate, slightly concave mesally. Ninth sternite complete mesally.

**Adult female**

Unknown

**Type Material**

HOLOTYPE $^\circ$ (dissected from and mounted with pupal skin): ARGENTINA, Tucumán Prov., Quebrada de los Sosa Acheral, 12 October 1950 (P. Wygodzinsky) [AMNH].

**Additional Specimens**

10 larvae, 7 pupae: same data as holotype [AMNH, LACM].
Figures 40-43. Maruina (M.) pupae, dorsal aspect, left, enlargement of trumpet, right. 40. garota, new species; 41. bellaca, new species; 42. campesina, new species; 43. lanceolata (Kincaid).
Figure 44. *Munina (M.) garoia*, new species, larva.
1973  TAXONOMY OF MARUINA  45

DISTRIBUTION
Andean Argentina

REMARKS
I was able to examine the same material which Quate and Wirth (1951: 161) identified as pilosella and determined that it actually represents a distinct species.

16. Maruina (Maruina) garota
Hogue, new species
Figures 40, 44-46

DIAGNOSIS
Larva.—Two small groups of spines located ventrally near the lateral margin of each abdominal segment, a lesser anterior group immediately posterior to the pleural hairs and a stronger group on the posterior annulus of the segment. Pupa.—Frontal suture complete. Base of trumpet set in a well sclerotized, broad collar. Adult male.—Dististyle broad at base, tapering sharply to an acute apex. Ninth sternite strong and complete mesoventrally. Adult female.—Depression between lobes of subgenital plate deep. Lobe of subgenital plate with five or more large bristles, base of plate narrow.

DESCRIPTIONS
Larva (Fig. 44)
General.—Trunk form elongate; L/W 3.3.
Size.—Moderate for Maruina. Length 2.4, width 0.7. Head width 0.43 [N = 6].

Pigmentation.—General pigmentation of dorsum even. Tergites all equally well sclerotized. Platelets distinct.

Structure.—Genal angle of head broadly rounded, denticles undeveloped. Peripheral alveolar processes low rounded tubercles only, except on segment VII where developed into scattered denticulate projections. Two small patches of spines located ventrally near the lateral margin of each abdominal segment, a lesser, anterior patch immediately posterior to the pleural hairs and a stronger patch on the posterior annulus of the segment. Lateral interannular incisions shallow, forming very flat lobes; posteriormost lobe poorly developed. Siphonal segment rectangular in general shape, tapering and rounded posteriorly.

Chaetotaxy.—Head: genal hair 1 single, hair 3 multibranched, large. Trunk: hairs p3 T-VII all single, subequal to hairs p2; pr2 three branched; p1 and mt7 small and branched. Siphonal segment: hair sl3 normal; number of hairs on flabellar lobes: dorsal—14, ventral—34; terminal fringe with 21 hairs.

Pupa (Fig. 40)
Size.—Moderate for Maruina: overall length 1.9; width 1.2 [N = 2]; trumpet length 0.27.


Structure.—General shape elliptical. Frontal suture complete. Trumpet long (T/BE 0.9); sur-

Figures 45-46. Maruina (M.) garota, new species, 45. male genitalia; 46. female genitalia.
face fairly smooth; shape obconicoid; base angled, shaft straight; pinna ciliate, apical with 33 pairs of rachi.

**Adult male**

*General.*—Eyes widely separated, interocular space equal to nine facet diameters. Number of segments in antennal flagellum not determinable from material.

*Genitalia.*—Fig. 45. Surstyle elongate, tenaculum typical. Dististyle shorter than basistyle; former simple, curved entally, apex sharply acute. Basistyle with 23-26 scales in ventral patch. Aedeagal spines monomorphic, all very long and slender. Posterior portion of aedeagal sheath membranous. Subgenital valvula moderately prominent, broad, truncate. Ninth sternite poorly developed.

**Adult female**

*General.*—Eyes disjunct, interocular space equal to twelve facet diameters. Antennal flagellum with 14 segments, terminal segment diminutive, ovoid.

*Genitalia.*—Fig. 46. Laterobasal margin of cercus without straplike sclerotization. Subgenital plate: basic form not specially modified from that described for subgenus; lobes short (interlobular depression very shallow), broadly rounded, divergent, arising from a moderately narrowed base. Spermaticcal complex: posterolateral corner of pons spermathecae projecting laterally, not over base of subgenital plate; corni divaricate, intercorneal angle approximately 115 degrees, apices angulate. Postmarginal sclerite narrow.

**Type Material**

*HOLOTYPE* ♂ and *ALLETYPE* ♀ (both dissected from and mounted with pupal skins): BRAZIL, Rio de Janeiro State, Parque Nacional do Itatiaia, Rio Campo Bello, 500 m, 26-28 November 1970 (C. L. Hogue, D. B. Bright, J. Guimarães) [MSP].

**Additional Specimens**

26 larvae: same data as holotype [MSP, LACM].

**Distribution**

Southeastern Brazil

**Remarks**

There is a slight similarity of the pupal trumpet of *garota*, especially in the presence of a basal collar, to that figured by Müller for *spinosa*. Also, the groups of spiny processes on the lateral margin of the larvae may have possibly inspired Müller's name for that species. However, since Müller's material is lost and his descriptions are insufficiently detailed to definitely establish the identity of *spinosa*, I feel justified in describing as new my material from southeastern Brazil. The type locality of *spinosa* is more than 600 km to the south of that for *garota* in a complex mountainous region capable of containing many unknown *Maruina*.

17. **Maruina (Maruina) chica** Hogue, new species

*Figures 47-49, 61*

**Diagnosis**


**Descriptions**

*Larva* (Fig. 47)

*General.*—Trunk form elongate-oval; L/W 2.3.

*Size.*—Moderate for *Maruina*. Length 2.3, width 1.0. Head width 0.38.

*Pigmentation.*—General pigmentation of dorsum even. Tergites all equally well sclerotized. Platelets distinct.

*Structure.*—Genal angles of head, acutely rounded, with small denticles. Peripheral alveolar processes of long apically fringed projections complete on all trunk segments. Lateral interannular incisions moderately deep, forming rounded lobes; posteriormost lobe with oblique apex, posterior angle rounded, projecting to slightly less than midlength of siphonal segment. Siphonal segment pentangular, sides parallel.

*Chaetotaxy.*—Head: genal hair 1 two branched, hair 3 six branched, large. Trunk: hairs p3 T-VII one to two branched; p2 three branched; p1 and mt7 minute, one to two branched. Siphonal segment: hair s13 normal; number of hairs on flabellar lobes: dorsal—7, ventral—20; terminal fringe with 7 hairs.

*Pupa* (Fig. 61)

*Size.*—Moderate for *Maruina*: overall length 2.0; width 1.3; trumpet length 0.17.

*Pigmentation.*—Dorsum evenly dark. Crenulae weakly developed posteromarginally on abdominal tergites only. Escharae indistinct.
Figure 47. *Maruina (M.) chica*, new species, larva.
Structure.—General shape elliptical. Frontal suture complete. Dorsal integument finely spicate. Trumpet moderately long (T/BE 0.9); surface smooth, shape clavate, with a conspicuous subapical perpendicular acute projection, base and shaft straight; pinna craticulate, apical with 9-10 pairs of rachi.

**Adult male**

*General.*—Eyes disjunct, interocular space equal to nine facet diameters. Antennal flagellum with 14 segments, terminal segment equal to subterminal.

*Genitalia.*—Fig. 48. Surstyle elongate, tenaculum typical. Dististyle shorter than basistyle; former simple, boomerang-shaped, angled ectally, apex broadly rounded. Basistyle with fifteen to sixteen scales in ventral patch. Aedeagal spines dimorphic: five to six pairs of elongate major aedeagal spines, subequal in size and shape; minor spines long and slender, acicular. Posterior portion of aedeagal sheath lightly sclerotized laterally. Subgenital valve very prominent, trucate. Ninth sternite incomplete mesally.

**Adult female**

*General.*—Eyes disjunct, interocular space equal to nine facet diameters. Antennal flagellum with 14 segments, terminal segment subequal to subterminal.

*Genitalia.*—Fig. 49. Laterobasal margin of cercus without straplike sclerotization. Subgenital plate: basic form not specially modified from that described for subgenus; lobes elongate (interlobular depression deep), narrow, subparallel, arising from a broad base. Spermathecal complex: postero-lateral corner of pons spermathecae projecting laterally, not over base of subgenital plate; corni divaricate, intercorneal angle approximately 95 degrees, apices acute. Postmarginal sclerite narrow.

**Type Material.**

HOLOTYPE δ and ALLOTYPE ♀ (both dissected from and mounted with pupal skins): COSTA RICA, Guanacaste Prov., Rio Corobicí and Pan American Highway, Finca La Pacifica, 12 February 1969 (C. L. Hogue, CLH 221) [LACM].

5 δ, 4 ♀ PARATYPES: same data as holotype [LACM, USNM].

**Additional Specimens**

221 larvae, 131 pupae: same data as holotype [LACM].

All specimens following unless noted otherwise (collected by C. Hogue) [LACM]:

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**Figures 48-49.** _Maruina (M.) chica_, new species, 48. male genitalia; 49. female genitalia.
COSTA RICA

Alajuela Province
2 ♀: Higuito, San Mateo, no date (P. Schild) [USNM].

Guanacaste Province
5 larvae, 9 pupae and pupal skins: Río Abangares and Pan American Highway, 11 June 1972.
59 larvae, 44 pupae: Río Corobicí and Pan American Highway, 14 June 1972.

Puntarenas Province
42 larvae, 16 pupae and pupal skins: Río Aranjuez and Pan American Highway, 18 June 1972.
140 larvae, 84 pupae and pupal skins: Río Cireulas and Pan American Highway, 14 June 1972.
105 larvae: Río Jabá, Las Cruces, rock quarry, 26 June 1972.

San José Province
10 larvae: Río Quebradas, San Isidro del General, 21 June 1972.

Distribution
Costa Rica

18. Maruina (Maruina) cachila
Hogue, new species
Figures 33, 50-52

Diagnosis
Larva.—Body form elongate-oval. Shallowly lobed laterally, lobe of annulus 25 small, of annulus 7 undeveloped. Siphonal segment pentangulate, widest almost at midlength. Pupa.—Crenulae distinct on abdominal tergites, including lateromarginal series as a distinct line. Pinna constricted, with five radially arranged rachi. Adult male.—One pair of asymetrically acuminate major aedeagal spines. Adult female.—Posterolateral corner of pons spermathecae projecting laterally, not over base of subgenital plate. Lobe of subgenital plate broadly rounded.

Descriptions
Larva (Fig. 50)
General.—Trunk form elongate-oval, nearly elongate; L/W 2.6.
Size.—Moderate for Maruina. Length 2.5, width 1.0. Head width 0.42 [N = 4].
Pigmentation.—General pigmentation forming a light and dark pattern on dorsum: pale peripherally; dark in broad median quadrato area on abdomen except segment VII; a narrower dark area (same width as prothoracic tergites) on thorax. Tergites all equally well sclerotized. Platelets distinct.
Structure.—Genal angle of head acutely rounded; denticles small. Peripheral alveolar processes developed into long apically fringed projections on posterior abdominal segments only. Lateral interannular incisions shallow, forming moderately convex lobes; posteriormost lobe moderately developed, rounded. Siphonal segment pentangulate, widest almost at midlength.
Chaetotaxy.—Head: genal hair 1 small, four to five branched, hair 3 multibranched, Trunk: hairs p3 T-VII three to five branched; p2 four to five branched; p1 and mt7 small and multibranched. Siphonal segment: hair s13 normal, number of hairs on flabellar lobes: dorsal—7, ventral—24; terminal fringe with 15 hairs.

Pupa (Fig. 33)
Size.—Moderate for Maruina: overall length 2.1; width 1.3 [N = 8]; trumpet length 0.15.
Pigmentation.—Dorsum evenly dark. Crenulae distinct on scutum (isolated arcuate series posteriorly) and complete along all margins of abdominal tergites (lacking on metascutum and anteromarginally on abdominal segment I).
Structure.—General shape elliptical. Frontal suture complete. Trumpet short (7/BE 0.6); surface smooth; shape clavicate, base straight, shaft strongly curved, base straight; pinna fasciculate, apical, constricted, with 5 radially arranged rachi.

Adult male
General.—Eyes disjunct, interocular space equal to seven facet diameters. Antennal flagellum with 14 segments, terminal segment equal to subterminal.
Genitalia.—Fig. 51. Surstyle elongate, tenaculum typical. Dististyle shorter than basistyyle; former moderately incurved, apex rounded. Basistyyle with 30-33 scales in ventral patch. Aedeagal spines dimorphic: one pair of major, asymmetrical, broad, acuminate spines; minor spines long and slender aciccular. Posterior portion of aedeagal sheath weak-
Figure 50. *Maruina (M.) cachita*, new species, larva.
Figures 51-52. Maruina (M.) cachita, new species, 51. male genitalia; 52. female genitalia.

Adult female

General.—Eyes disjunct, interocular space equal to eight facet diameters. Antennal flagellum with 14 segments, terminal segment equal to subterminal.

Genitalia.—Fig. 52. Laterobasal margin of cercus without straplike sclerotization. Subgenital plate: basic form not specially modified from that described for subgenus; lobes elongate (interlobular depression deep), divergent, apices broadly rounded, arising from a moderately narrowed base. Spermathecal complex: posterolateral corner of pons spermathecae projecting laterally, not over base of subgenital plate; corni contrary, apices rounded. Postmarginal sclerite narrow.

Type Material
HOLOTYPE ♀ and ALLOTYPE ♂ (both dissected from and mounted with pupal skins): PERU, Junín Dept., Huancapistana, 1800 m, 27-30 July 1965 (P. & B. Wygodzinsky) [AMNH].

4 ♀, 5 ♂ PARATYPES (dissected from and mounted with pupal skins): same data as holotype [AMNH, LACM].

Additional Specimens
22 larvae, 27 pupae: same data as holotype [AMNH, LACM].

Distribution
Peru

19. Maruina (Maruina) dama
Hogue, new species
Figures 34, 53-55

Diagnosis
Larva.—Very similar to tica. Body form elongate. Lobe of posteriormost annulus (23) undeveloped. Siphonal plate broad, ratio of length to width = 1.2, widest point about at basal one-fourth. Tergites all equally well sclerotized. Pupa.—Antero- and posteromarginal crenulae only on abdominal tergites, none associated with escharae. Trumpet clavate, moderately long and evenly pigmented. Adult male.—Apex of tenaculum with transverse serrations. Adult female.—Margin 1 of subgenital plate with a median lobe. Apex of cornus spermathecae rounded.

Descriptions
Larva (Fig. 53)

General.—Trunk form elongate; L/W 3.3.
Size.—Moderate for Maruina. Length 2.3, width 0.7. Head width 0.43 [N = 6].

Pigmentation.—General pigmentation of dorsum evenly dark. Tergites all equally well scleritized. Platelets generally distinct.

Structure.—Genaal angle of head broadly rounded, denticles minute. Peripheral alveolar processes developed as acute denticles anteriorly, long, fringed projections posteriorly. Lateral intranurular incisions shallow, forming low rounded lobes; posteriorly lobe poorly developed. Siphonal segment quadrangular, narrowed posteriorly, length/width siphonal plate = 1.2, widest point about at basal one-fourth.

Chaerotaxy.—Head: genal hair 1 single, hair 3 three branched, moderately large. Trunk: hairs p3 P-M single, p3 I two branched, p3 II-VII four to six branched; pr2 two to four branched; p1 minute and double; mt7 small and single. Siphonal segment: hair s3 normal; number of hairs on flabellate lobes: dorsal—12, ventral—34-38; terminal fringe with 12-13 hairs.

Pupa (Fig. 34)

Size.—Moderate for Maruina: overall length 1.9; width 1.3; trumpet length 0.11.

Pigmentation.—Dorsum of cephalothorax evenly dark; antero- and posterolateral corners of abdominal tergites pale. Crenulae distinct on scutum and antero- and postero-marginally on abdominal tergites, crenular units large and separated (series open or broken), incomplete laterally. Escharae distinct.

Structure.—General shape elliptical. Frontal suture complete. Trumpet short (T/BE 0.5); surface smooth; shape clavate, base and shaft straight; pinna fasciculate, apical, constricted, with 8 radially arranged rachi.

Adult male

General.—Eyes disjunct, interocular space equal to seven facet diameters. Antennal flagellum with 14 segments, terminal segment equal to subterminal.

Genitalia.—Fig. 54. Surstyle elongate, tenaculum clavate, with conspicuous transverse serrations on apex. Dististyle shorter than basistyle; former simple, gradually tapered apically, apex rounded; latter unusually elongate. Basistyle with 25-30 scales in ventral patch. Aedeagal spines dimorphic: two pairs of major curved, lanceolate spines; minor spines very long and slender, acicular. Posterior portion of aedeagal sheath membranous throughout. Subgenital valvule very prominent, truncate. Ninth sternite weakly sclerotized mesally.

Adult female

General.—Eyes disjunct, interocular space equal to eight facet diameters. Antennal flagellum with 14 segments, terminal segment subequal to subterminal.

Genitalia.—Fig. 55. Laterobasal margin of cer-

Figures 54-55. Maruina (M.) doma, new species, 54. male genitalia; 55. female genitalia.
Figure 56. *Maruina (M.) campesina*, new species, larva.
cus without straplike sclerotization. Subgenital plate: an arcuate fold present mesobasally, margin 1 angled anteromesally; lobes elongate (interlobular depression deep), narrow, slightly incurving, rounded apically, arising from a moderately narrowed base. Spermathecal complex: posterolateral corner of pons spermathecae projecting posteriorly over base of subgenital plate; corns contrary, base of cornus very broad, apex rounded. Postmarginal sclerite narrow.

**Type Material**

**HOLOTYPE** ♂ and **ALLOTYPE** ♀ (both dissected from and mounted with pupal skins): COSTA RICA, Puntaarenas Prov., Rio Jabá, Las Cruces, rock quarry, 26-27 June 1972 (C. Hogue) [LACM].

9 ♂, 9 ♀ **PARATYPES** (all but 1 ♀ dissected from and mounted with pupal skins): same data as holotype [LACM, USNM].

**Additional Specimens**

501 larvae, 252 pupae and pupal skins: same data as holotype.

COSTA RICA

**Puntarenas Province**

113 larvae: Quebrada Salto, near Barú, 28 June 1972 (C. Hogue) [LACM].

**San José Province**

1 ♂ (dissected from and mounted with pupal skin): Rio General and Pan American Highway, 10 mi S San Isidro del General, 22 June 1972 (C. Hogue) [LACM].

**Distribution**

Costa Rica

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**20. Maruina (Maruina) campesina**

Hogue, new species

Figures 42, 56-57

**Diagnosis**

**Larva.**—Body form elongate-oval. Abdominal segments strongly lobed laterally, those of the posterior annuli of each segment asymmetrical, oblique, with acute apices. **Pupa.**—Trumpet rugose, a series of two to three irregular ridges encircling the subapical portion of the shaft (below pinna). **Adult male.**—Posterior portion of aedeagal sheath largely membranous, without a transverse arch. Apex of disti-style bifurcate.

**Descriptions**

**Larva** (Fig. 56)

**General.**—Trunk form elongate-oval; L/W 2.2.

**Size.**—Moderate for *Maruina*. Length 2.3, width 1.1. Head width 0.43 [N = 6].

**Pigmentation.**—General pigmentation of dorsum even. Tergites variably well sclerotized. Plalets distinct.

**Structure.**—Genal angles of head angulate, acutely rounded, with small denticles. Peripheral alveolar processes of moderately long, apically fringed projections complete on all trunk segments. Lateral interannular incisions moderately deep, forming rounded lobes; posteriormost lobe with oblique apex, posterior angle acute, projecting to midlength of siphonal segment. Siphonal segment quadrangular, sides convex.

**Chaetotaxy.**—Head: genal hair 1 four branched, hair 3 multibranched, large. Trunk: hairs p3 T-VII one to two branched; pr2 three to five branched; p1 and mt7 minute and branched. Siphonal segment: hair sI3 normal; number of hairs on flabellar lobes: dorsal—12, ventral—36; terminal fringe with 16 hairs.

**Pupa** (Fig. 42)

**Size.**—Moderate for *Maruina*: overall length 2.0; width 1.3 [N = 3]; trumpet length 0.24.

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**Figure 57. Maruina (M.) campesina**, new species, male genitalia.
Figure 58. Maruina (M.) vildania, new species, larva.
Pigmentation.—Dorsum evenly dark. Crenulae conspicuous on scutum and antero- and postero-marginally on abdominal tergites, forming a pair of arcuate series laterally, one posterolaterally representing a continuation of the postero-marginal series, and a second immediately posterior to the spiracle. Escharae distinct.

Structure.—General shape ovate. Frontal suture complete. Trumpet long (T/BE 1.2); surface rugose, a series of two to three irregular ridges encircling the subapex below pinna; shape clavate, base and shaft straight; pinna fasciculate, apical, constricted, with 11-12 radially arranged rachi.

Adult male

General.—Eyes disjunct, interocular space equal to seven facet diameters. Antennal flagellum with 14 segments, terminal segment equal to sub-terminal.

Genitalia.—Fig. 57. Surstyle elongate, tenaculum typical. Dististyle shorter than basistyle; former simple, straight and with an unequally bifid apex. Basistyle with 20-27 scales in ventral patch. Aedeagal spines dimorphic: four to five pairs of major, lanceolate spines of which dorsalmost are arched ectally; minor spines long and slender, acicular. Posterior portion of aedeagal sheath weakly sclerotized laterally. Subgenital valvule moderately prominent, truncate, outer angles obtuse. Ninth sternite incomplete mesally.

Adult female

Unknown

Type Material

HOLOTYPE ♂ (dissected from and mounted with pupal skin): COLOMBIA, Cundinamarca Dept., road Sibate—Aguadita, 2270 m, 25 July 1967 (P. Wygodzinsky) [AMNH].

3 ♂ PARATYPES (dissected from and mounted with pupal skins): same data as holotype [AMNH, LACM].

Additional Specimens

11 larvae, 26 pupae: same as holotype [AMNH, LACM].

Distribution

Andean Colombia

21. Maruina (Maruina) vidamia

Hogue, new species

Figures 58-60, 69

Diagnosis

Larva.—Body form elongate. Lobe of posterior-most annulus (25) undeveloped. Siphonal segment elongate. Pupa.—Trumpet very long and slender (length/width ratio 9 or greater). Adult male.—Posterior portion of aedeagal sheath membranous, no transverse arch. Dististyle bipartite. Tenaculum longitudinally striate. Adult female.—Depression between lobes of subgenital plate deep; lobe with five or more large bristles; base of plate broad. Postero-lateral corner of pons spermathecae expanded into a broad plate, not above base of subgenital plate.

Descriptions

Larva (Fig. 58)

General.—Trunk form elongate; L/W 3.5.

Size.—Small for Maruina. Length 1.9, width 0.6. Head width 0.36.

Pigmentation.—General pigmentation of dorsum evenly dark. Tergites all equally well sclerotized. Platelets generally distinct.

Structure.—Genal angles of head broadly rounded, denticles minute. Peripheral alveolar processes developed as acute denticles anteriorly, long fringed projections posteriorly. Lateral interannular incisions shallow, forming low rounded lobes; posteriormost lobe (25) poorly developed. Siphonal segment elongate, slightly constricted subapically; projecting upward conspicuously in living larvae.

Chaetotaxy.—Head: genal hairs 1 and 3 single; both moderately large. Trunk: hairs p3 P-M single, p3 T two-branched, p3 I-VIII multi-branched; pr2 multi-branched; p1 minute and double; mt7 small and single. Siphonal segment: hair s13 normal; number of hairs on flabellar lobes: dorsal—10-12, ventral—28-32; terminal fringe with 10 hairs.

Pupa (Fig. 69)

Size.—Moderate for Maruina: overall length 1.9; width 1.2; trumpet length 0.19.

Pigmentation.—Dorsum evenly dark. Crenulae conspicuous on scutum and antero-ard postero-marginally on abdominal tergites; also a sublateral group of isolated crenular units mostly posterior to spiracles. Escharae distinct, closely encircled with crenulae.

Structure.—General shape elliptical. Frontal suture complete. Trumpet long (T/BE 1.0), very slender (length/width 9 or greater); surface smooth; shape elongoclavate, base and shaft straight; pinna fasciculate, subapical, with 6-7 radially arranged rachi.

Adult male

General.—Eyes disjunct, interocular space equal to eight facet diameters. Antennal flagellum
with 14 segments, terminal segment equal to subterminal.

Genitalia.—Fig. 59. Surstyle elongate, tenaculum very long (nearly half the length of the surstyle), obliquely spatulate, apex longitudinally striate. Dististyle shorter than basistyle; former unequally bifurcate, the ventral ramus shorter; both rami with acute apices. Basistyle broad, triangular, with 8-9 scales in ventral patch. Aedeagal spines dimorphic: five pair of unequal major spines, shaped as shown in figure; minor spines long and slender, acicular. Posterior portion of aedeagal sheath with ventral, and subventral, sclerotizations. Subgenital valvule very prominent, truncate. Ninth sternite complete.

Adult female

General.—Eyes disjunct, interocular space equal to nine facet diameters. Antennal flagellum with 14 segments, terminal segment diminutive. Pulpal proportions 4:4:5:8.

Genitalia.—Fig. 60. Laterobasal margin of cercus without straplike sclerotization. Subgenital plate: margin 1 transverse undulate and sclerotized to a slight extent posteriorly; lobes short (interlobular depression shallow), divergent, rounded apically, arising from a broad base. Spermathecal complex: posterolateral corner of pons spermathecae projecting laterally, not over base of subgenital plate; region of pons immediately anterior to corner expanded into a broad, rounded flange; corni di-

varicate, intercorneal angle approximately 135 degrees, apices asymmetrically rounded. Postmargi- nal sclerite moderately broad.

Type Material

HOLOTYPE ♂, ALLOTYPE ♀ (both dissected from and mounted with pupal skins): COSTA RICA, Puntarenas Prov., Rio Jabalí, Las Cruces, rock quarry, 26-27 June 1972 (C. Hogue) [LACM].

10 ♀, 9 ♀ PARATYPES (part dissected from and mounted with pupal skins): same data as holotype [LACM, USNM].

Additional Specimens

45 larvae, 94 pupae and pupal skins: same data as holotype [LACM, USNM].

Distribution

Costa Rica

Remarks

Association of the larva with the other stages is not certain (based only on common occurrence and relative abundance to other species—statistical method).

22. Maruina (Maruina) tica Hogue, new species

Figures 35, 65-67

Diagnosis

Larva.—Very similar to dami. Body form elon-
Figure 65. Marsina (M.) tica, new species, larva.
TAXONOMY OF MARUINA

gate. Tergites of segment V usually distinctly pale compared to others. Siphonal plate broad, ratio of length to width 1.0, widest point near midlength. Lobe of posteriormost annulus (25) undeveloped.

Pupa.—Crenulae of abdominal tergites forming a longitudinal, submarginal line marking off a contrasting broad median dark zone from lateral pale areas. Adult male.—Two or more pairs of major aedeagal spines arranged in a longitudinal row, diminishing in size posteriorly. Adult female.—Posterolateral corner of pons spermthecae projecting posteriorly over base of subgenital plate. Margin 1 of subgenital plate a smooth arch. Apex of cornus spermthecae acute and recurved.

DESCRIPTIONS

Larva (Fig. 65)

General.—Trunk form elongate; L/W 2.9.

Size.—Moderate for Maruina. Length 2.4, width 0.9. Head width 0.43 [N = 9].

Pigmentation.—General pigmentation of dorsum even. Tergites of segment V poorly sclerotized, distinctly pale compared to others. Platelets distinct.

Structure.—Genal angle of head broadly rounded, with conspicuous denticles. Peripheral alveolar processes very small except for long, apically fringed projections on segments VI and VII. Lateral interannular incisions shallow forming moderately convex lobes; posteriormost lobe undeveloped. Siphonal segment quadrangular, narrowed posteriorly, length/width ratio of siphonal plate 1.0, widest point about midlength.

Chaetotaxy.—Head: genal hair 1 small and two to three branched, 3 five to six branched. Trunk: hairs p3 T-VII five to eight branched; p2 five to six branched; p1 and m7 minute and single. Siphonal segment: hair s13 normal; number of hairs on flabellar lobes: dorsal—11, ventral—41; terminal fringe with 15 hairs.

Pupa (Fig. 35)

Size.—Moderate for Maruina: overall length 2.0; width 1.4; trumpet length 0.14.

Pigmentation.—Dorsum of cephalothorax and median area of abdomen evenly dark; abdominal dorsum pale abruptly lateral to a longitudinal series of fine crenulae running entire length of abdomen; scutal and posteromarginal crenulae of abdominal tergites also distinct. Escharae distinct.

Structure.—General shape elliptical. Frontal suture complete. Trumpet short (T/BE 0.6); surface smooth; shape clavate, base and shaft straight; pinna fasciculate, apical, constricted, with 6-7 radially arranged rachi.

Adult male

General.—Eyes disjunct, interocular space equal to eight facet diameters. Antennal flagellum

with 14 segments, terminal segment equal to subterminal.

Genitalia.—Fig. 66. Surstyle elongate, tenaculum typical. Distystyle shorter than basistyle; former simple, straight, triangular, with a narrowly rounded apex. Basistyle with 20-25 scales in ventral patch. Aedeagal spines dimorphic: seven pairs of aedeagal spines, a conspicuous posteroventral pair each with a broad base and acuminate apex; others gradually smaller ventrally and anteriorly. Posterior portion of aedeagal sheath weakly sclerotized laterally. Subgenital valvule moderately prominent, broadly rounded in outline. Ninth sternite incomplete mesally.

Adult female

General.—Eyes disjunct, interocular space equal to seven facet diameters. Antennal flagellum with 14 segments, terminal segment subequal to subterminal.

Genitalia.—Fig. 67. Laterobasal margin of cercus without straplike sclerotization. Subgenital plate: basic form not especially modified from that described for subgenus; lobes elongate (interlobular depression deep), divergent, apices rounded, arising from a moderately narrowed base. Spermathecal complex: posteroventral corner of pons spermathecae projecting posteriorly over base of subgenital plate; corni divaricate, intercorneal angle approximately 130 degrees; bases broad, apices acuminate, slightly recurved. Postmarginal sclerite broad.

Type Material

HOLOTYPE ♂ and ALLOTYPE ♀ (both dissected from and mounted with pupal skins): COSTA RICA, San José Prov., San Isidro del General, Rio Quebradas, 10 June 1967 (C. L. Hogue, CLH 170A) [LACM].

1 ♂, 2 ♀ PARATYPES (dissected from and mounted with pupal skins): same data as holotype [LACM, USNM].

Additional Specimens

93 larvae, 138 pupae, 1 ♀: same data as holotype [LACM].

All specimens following (collected by C. Hogue) [LACM]:

COSTA RICA

Alajuela Province

2 larvae, 2 pupae and pupal skin: Rio Vigia, 0.7 mi W Grecia, 18 June 1972.

Guanacaste Province


Puntarenas Province

36 larvae, 33 pupae: Osa Peninsula, 1.8 mi W Rincón, Quebrada Agua Buena, 1 March 1971.


1 ♂, 5 larvae, 26 pupae and pupal skins: Rio Cañablanca and Pan American Highway, 23 June 1972.

1 larva: Quebrada Salto, near Barú, 28 June 1972.

San José Province

1 larva, 18 pupae: Rio Pedregoso, 1.8 mi S San Isidro del General, 28 June 1972.


Distribution

COSTA RICA

Remarks

The larva of tica is the only one which exhibits the striking characteristics of having the tergal plates of one abdominal segment distinctly pale. Though seemingly a tenuous feature on which to attach reliability for identification, its constancy is high. A few specimens fail to show the characteristic but may actually be of the closely related dama, or of an undescribed form.

23. Maruina (Maruina) nina Hogue, new species

Figures 68, 70, 71-72

Diagnosis

Larva.—Body form elongate-oval. Lobe of posteriormost annulus (25) well developed and parallel
Figure 68. Maruina (M.) nina, new species, larva.

**Adult male.**—Base of surstyle conspicuously swollen.

**Adult female.**—Depression between lobes of subgenital plate deep, lobe with five or more large bristles; base of plate broad. Posterolateral corner of pons spermatothecae projecting posteriorly over subgenital plate.

**Descriptions**

**Larva (Fig. 68)**

**General.**—Body form elongate-oval; L/W 2.5.

**Size.**—Moderate for *Maruina*. Length 2.3, width 0.9. Head width 0.42.

**Pigmentation.**—Generally even. Tergites all equally well sclerotized. Platelets distinct.

**Structure.**—Genal angles of head broadly rounded, denticles minute. Peripheral alveolar processes developed as acute denticles anteriorly, long denticulate processes posteriorly. Lateral interannular incisions moderately deep, forming rounded lobes; posteriormost lobe triangular, projecting to basal one-third of siphonal segment. Siphonal segment broadly ovoid, sides converging posteriorly.

**Chaetotaxy.**—Head: genal hair 1 single, hair 3 three-branched, large. Trunk: hairs p3 T-VII single; pr2 three-branched; p1 and mt7 minute, single. Siphonal segment: hair sl3 normal, number of hairs on flabellar lobes: dorsal—10, ventral—31; terminal fringe with 12 hairs.

**Pupa (Fig. 70)**

**Size.**—Moderate for *Maruina*: overall length 2.0; width 1.3; trumpet length 0.15.

**Pigmentation.**—Dorsum evenly dark, except for paler mediolateral areas on abdominal tergites. Crenulae conspicuous on scutum and antero- and posteromarginally on abdominal tergites; also scattered isolated crenular units over all of tegite except lateromarginally. Escharae distinct, closely encircled with crenulae.

**Structure.**—General shape elliptical. Frontal suture complete. Trumpet moderately long (T/BE 0.7); surface smooth; shape clavate, base and shaft straight; pinna fasciculate, apical, with 7-8 rachi arranged in an ellipse.

**Adult male**

**General.**—Eyes disjunct, interocular space equal to eight facet diameters. Antennal flagellum with 14 segments, terminal segment equal to subterminal.

**Genitalia.**—Fig. 71. Surstyle elongate, dilated subbasally, tenaculum typical. Dististyle shorter than basistyle; former simple, tapered apically, apex
rounded. Basistyle with 24-25 scales in ventral patch. Aedeagal spines dimorphic: four to five pair of major aedeagal spines, the posteriormost distinct in shape from others, broader with an oblique, rather than symmetrically acute, apex; minor spines long and slender aciculur. Posterior portion of aedeagal sheath lightly sclerotized laterally. Subgenital valvule very prominent, truncate. Ninth sternite weakly sclerotized mesally.

**Adult female**

*General.*—Eyes disjunct, interocular space equal to eight facet diameters. Antennal flagellum with 14 segments, terminal segment slightly smaller than subterminal.

*Genitalia.*—Fig. 72. Laterobasal margin of cercus without straplike sclerotization. Subgenital plate: basic form not specially modified from that described for subgenus; lobes short (interlobular depression shallow), broadly rounded, arising from a broad base. Spermathecal complex: posterolateral corner of pons spermathecae projecting posteriorly over base of subgenital plate; corns contrary, bases very broad, apices acute, uncinate. Postmarginal sclerite moderately broad.

**Type Material**

**HOLOTYPE ♂,** **ALLOTYPE ♀** (both dissected from and mounted with pupal skins): COSTA RICA, San José Prov., Rio Quebradas, San Isidro del General, 10 mi S San Isidro del General, 22 June 1972 (C. Hogue) [LACM].

8 ♂, 9 ♀ PARATYPES (dissected from and mounted with pupal skins): same data as holotype [LACM, USNM].

**Additional Specimens**

287 pupae and pupal skins: same data as holotype [LACM, USNM].

All specimens following collected by C. Hogue [LACM]:

**COSTA RICA**

**Guanacaste Province**


**Puntarenas Province**


**San José Province**

1 ♀ (dissected from and mounted with pupal skin): Rio Quebradas, San Isidro del General, 10 June 1967.

**Distribution**

Costa Rica

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**Figures 71-72.** Maruina (M.) nina, new species, 71. male genitalia; 72. female genitalia.
Figure 73. *Maruina (M.) lanceolata* (Kincaid), larva.
24. *Maruina (Maruina) lanceolata*  
(Kincaid)  
Figures 43, 73-75


**Recognition**

* Larva.—Body form elongate. Lobe of annulus 25 well developed. At least one of hairs p3 M and T branched. Long fringed-tipped peripheral alveolar processes on posterior segments only. Siphonal segment subquadrate. *Pupa.—Crenulae posteromeral to abdominal spiracles arranged into short rows and encircling escharae.*  

*Adult male.—Dististyle broad at base, tapering gradually to an oblique apex. Ninth sternite incomplete mesoventrally.  

*Adult female.—Lateral portion of margin 1 of subgenital plate produced as a rounded lobe with a reticulate surface.*

**Descriptions**

* Larva* (Fig. 73)  
  
  **General.—**Trunk form elongate-oval; L/W 2.8.  
  **Size.—**Large for *Maruina*. Length 3.1, width 1.1. Head width 0.48 [N = 4].  
  **Pigmentation.—**General pigmentation of dorsum even. Tergites all equally well sclerotized. Platelets distinct.  
  **Structure.—**Genal angle of head subacute, denticles undeveloped. Peripheral alveolar processes developed as small denticulate projections fringing all segments. Lateral interannular incisions shallow, forming only moderately convex lobes, posteriormost lobe moderately developed, rounded. Siphonal segment quadrangulate, narrowed posteriorly, swollen near base.  
  **Chaetotaxy.—**Head: genal hairs 1 and 3 large, five to six branched. Trunk: hairs p3 T-VII and pr2 five to eight branched, dendritic; p1 and mt7 small and branched. Siphonal segment: hair sl3 normal, number of hairs on flabellar lobes: dorsal—15, ventral—49; terminal fringe with 20 hairs.

* Pupa* (Fig. 43)  
  
  **Size.—**Large for *Maruina*: overall length 2.5; width 1.7 [N = 1]; trumpet length 0.20.  
  **Pigmentation.—**Dorsum evenly dark medially, lighter on alar region and antero- and posterolateral corners of abdominal tergites. Crenulae distinct on scutum (an especially dense series from trumpet base to ec dysial line paralleling the paraf rontal su rite); antero- and posteromeral tergal series dis junct and incomplete laterally. Escharae distinct, encircled by crenulae.  
  **Structure.—**General shape elliptical. Frontal suture complete. Trumpet moderately long (T/BE 0.6); surface smooth: shape clavate, curved, base and shaft straight; pinna subericate, apical, with 5-6 pairs of rachi.

**Adult male**

  **Genitalia.—**Fig. 74. Surstyle elongate, tenaculum typical. Dististyle shorter than basistyle; former simple, curved entally, apex oblique. Basistyle with 10 scales in ventral patch. Aedeagal spines dimorphic: six to eight heavy, straight major spines; minor spines very long and slender, acicular. Posterior portion of aedeagal sheath with broad, light, lateral sclerotizations nearly meeting mesally. Subgenital valvule prominent, truncate. Ninth sternite complete mesally.

**Adult female**

*General.—*Eyes disjunct, interocular space equal to twelve facet diameters. Antennal flagellum with 13 segments, terminal segment slightly smaller than subterminal. Palpus proportions as in male.  
  **Genitalia.—**Fig. 75. Laterobasal margin of cercus without straplike sclerotization. Subgenital plate: lateral portion of margin 1 produced as a rounded lobe with a reticulate surface; lobes short (interlobular depression shallow), parallel, apices rounded, arising from a broad base. Spermathecal complex: posterolateral corner of pons spermathecae projecting laterally, not over base of subgenital plate; corni divaricate, intercornal angle approximately 150 degrees, apices angulate. Post marginal sclerite very broad, expanded sublaterally.

**Material**

Specimens from diverse localities in California were examined for this study. These will not be cited and the localities given by Quate, 1955: 240, not repeated. Only the following new record for Mexico will be added:  
15 larvae, 14 pupae: MEXICO, Baja California, San Pedro Martir Mountains, Arroyo Valladeres, 18 mi E Meling Ranch, 7400 ft, 17 May 1969 (C. L. Hogue) [LACM].

The species has been recorded recently for Canada by Downes, 1972.
Figures 74-75. Maruina (M.) lanceolata (Kincaid), 74. male genitalia; 75. female genitalia.

**Distribution**

British Columbia, Canada, through mountainous western North America to northern Baja California, Mexico.

**Remarks**

Variations in the tarsal and wing vestiture (see Quate and Wirth, 1951: 159) suggest that this widespread, common species may actually comprise a complex of yet unrecognized species or subspecies. In an area as vast as its total range, it would seem that more than one species of *Maruina* ought to occur.

25. *Maruina (Maruina) spinosa* Müller
   Not figured

*Maruina spinosa* Müller, 1895: 480. Original description. Type material not designated; original material lost. Type locality: Brazil, probably Province of Santa Catharina in tributaries Rios Garcia, Jordão and Caeté of Rio Itajahy (= Itajai) west of Blumenau.


**Remarks**

This species has not been recollected since Müller's original discovery. His descriptions are probably barely adequate to recognize the species should it again be found at the type locality.

26. *Maruina (Maruina) pilosella* Müller
   Not figured

*Maruina pilosella* Müller, 1895: 480. Original description. Types as noted for *spinoso* (see above).


**Remarks**

The remarks made for Müller's other species, *spinoso*, also apply here although, because he supplied drawings of the pupa and genitalia, recognition of this species may be accomplished where in the former case it will always be tenuous. (See also remarks under *garota.*)
Resumen

Las larvas y pupas de moscas psychidoides en el género *Maruina* (restrictido en distribución al Nuevo Mundo) viven como torentícolos epífilicos en arroyos montañosos desde British Columbia hasta la parte norte de Argentina. Los adultos frecuenten piedras emergentes y retraídos sombreados en la vecindad de los arroyos. Nuevas investigaciones acerca de la anatomía de estos estados revelan la existencia de muchas características apropiadas para distinguir y juntar las especies, especialmente en la quetotaxía de la larva, la forma del trompeta y ornamentación del superficie de la pupa, y la estructura genital de los adultos. Por medio de nuevos criterios, el género se divide en dos subgeneros, *Maruina* Müller y *ACULCINA* n. subg., Hogue. El número de especies conocidas al tiempo de la última revista (7) se aumenta hasta 26 con la descripción de las nuevas especies siguientes: *(Acucina)* amadora (Mexico, Costa Rica, Argentina), *amado* (Costa Rica), *querida* (Costa Rica), *cholita* (Costa Rica), *muchacha* (Costa Rica), *doncella* (Argentina), *chaborra* (Colombia); *(Maruina)* nanorada (Brazil), *chamaca* (Mexico, Costa Rica), *chamaquita* (Costa Rica), *bellaca* (Argentina), *garota* (Brazil), *chica* (Costa Rica), *cachita* (Peru), *dama* (Costa Rica), *campesina* (Colombia), *vidamia* (Costa Rica), tica (Costa Rica), *nina* (Costa Rica). El género necesita mucha mas trabajo taxonómico y morfológico puesto que probablemente existen muchas especies desconocidas y no entendemos en ni medio estado los adaptaciones a su ambiente difícil.

Literature Cited


Accepted for publication June 4, 1973