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Generic Descriptions of New World Lithinini (Lepidoptera, Geometridae)

FREDERICK H. RINDGE¹

ABSTRACT

The six genera of Lithinini from North America have been studied and described previously, but practically nothing is known about the members of this tribe from the remainder of the New World. Moths from Chile and adjacent Argentina have been studied for this group, and a number of genera are defined. The following genera and their type species (all described as new) are proposed: *Yalpa* (*Y. dalcachue*), *Callemo* (*C. monotonos*), *Guara* (*G. raphis*), *Siopla* (*S. derance*), *Nucara* (*N. recurva*), *Acauro* (*A. rotundus*), *Calta* (*C. lamella*), *Yapoma* (*Y. chone*), *Duraglia* (*D. xanthe*), and *Laneco* (*L. suffuscus*). The following generic changes are proposed: *Proteopharmacis* Warren, 1895, is placed as a junior subjective synonym of *Odontothera* Butler, 1882; *Catrielia* Orfila and Schajovskoy, "1959" [1960], is placed as a junior subjective synonym of *Euclidiodes* Butler, 1895; *Incalvertia*, replacement name and new status is proposed for *Calvertia* Warren, 1908, not Bourguignat, 1880.

On the specific level, *Lacaria monrosi* Orfila

and Schajovskoy, 1959, is placed as a synonym of *L. schajovskoyi* (Sperry, 1954); as this leaves the former species that was incorrectly identified without a name, *Lacaria orfilai*, new species, is proposed for this taxon.

Orfila and Schajovskoy, 1959, published the new tribal name Lacarini. After studying the group, I place the name Lacarini as a junior subjective synonym of Lithinini.

All the genera included in this paper have some of their diagnostic characters listed in several tables, are fully described, and are separable by using the keys to the adults based on external morphology and male genitalia. Illustrations for adults and genitalia of all the genera are included.

The difficulty with defining the Lithinini as a monophyletic group, based on shared apomorphic characters of the adults, is discussed. It is suggested that a careful analysis of the eggs, larvae, and pupae will have to be undertaken before any definitive characterization of the group can be obtained.

INTRODUCTION

For a number of years, I have been working on curating the extensive collection of Ennominae (Geometridae) from Chile in the collection of the American Museum of Natural History. In addition to working with the specimens, genitalic dissections of both sexes were made; these dissections usually served as the primary means of placing the species

into genera, and then grouping the genera into possible tribal units. There is an almost complete lack of literature on the tribes or tribal classification of South American Ennominae; the one exception is my recent paper on the Nacophorini (Rindge, 1983). While doing this curatorial work, it became evident that a significant part of the Chilean fauna on which

¹ Curator, Department of Entomology, American Museum of Natural History.

I was working included a group of usually slender-bodied moths, the male genitalia of which have an anellus with a paired process. This latter structure is usually present in the thicker bodied Nacophorini, but the two groups were apparently different. As this aroused my curiosity, I decided to study and attempt a generic classification of the slender-bodied group; the present paper is the result.

As my studies progressed, it became evident that these moths from Chile and adjacent Argentina should be placed in the tribe Lithinini; this group is represented in North America by six genera, with at least one being Holarctic in distribution. The North American genera are relatively well known, as they have been treated by Forbes (1948), Rupert (1949), and McGuffin (in press). Some work has been done on the Andean fauna of Argentina by Orfila and Schajovskoy (1959, "1959" [1960], 1963, 1964). These two authors proposed the new tribal name Lacarini (1959, p. 198) for *Lacaria*, with additional genera described in subsequent papers. In their second paper, Orfila and Schajovskoy ("1959" [1960]) redescribed *Euclidiodes* Warren, proposed *Catrielia* as new (placed as a synonym of *Euclidiodes* in the present paper), redescribed *Proteopharmacis* Warren (placed as a synonym of *Odontothera* Butler in the present paper), and named as new *Coronalia* (probably a member of the Ourapterygini) and *Pucaraia* (perhaps a member of the Nacophorini, although I did not include it in my 1983 revision; more study is needed but moths are now at hand so this can be done). Two additional genera were named in their 1963 paper, and another one in 1964, which I am including in this paper. Orfila and Schajovskoy gave as a diagnostic character for the Lacarini the fact that its members have lamellate-ciliate male antennae, whereas the males of the allied Lithinini have simple and prismatic antennae. Now that more genera have been studied, together with many more anatomical characters, I find that the supposed distinction between the two groups melts away and the two are indistinguishable. Accordingly, I am placing the name Lacarini as a junior subjective synonym of Lithinini.

My study is centered in North America and Chile and, to a lesser degree, adjacent Argentina. For the sake of convenience, I have di-

vided the systematic portion of this paper into two sections based on these geographical areas. Nothing is included from most of Mexico, Central America, or from South America outside the specified area. The reason for this tremendous geographical gap is that we simply do not know enough about the Neotropical geometrids to place the great majority of the described (and undescribed) genera into their appropriate tribes. The species are so numerous that it is not practical to dissect and study the genitalia of a significant number in a relatively short period of time. The included members of this tribe have such a varied habitus that normally you do not get any help or clues as to the possible members from this aspect. I fully realize that it is highly probable that the Lithinini do occur in tropical America and that, by not including them, my paper cannot be considered revisionary. But that was never my intent; all I am trying to do is to establish the presence of the tribe in the Southern Hemisphere, and to define some of the genera that occur in Chile and Argentina. This will give future workers a basis on which to build, which is my other objective.

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I also thank Mr. Juan C. Barberis, of the Department of Graphics, American Museum of Natural History, for preparing the genitalic drawings from my preliminary sketches, and for mounting all the figures. The adults were photographed by the author.

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TABLE 1
Nature of External Characters in the Lithinini

	Plesiomorphic state	Apomorphic state
1. Male antennae	Bipectinate or laminate	Serrate or simple
2. Length of palpi	Shorter than length of eye	As long as, or longer than, length of eye
3. Scaling on ventral portion of front	Same as on upper part	Elongate or forming tuft
4. Row of setae ventrally on third segment of male abdomen	Absent	Present (sometimes deciduous)
5. Hair pencil on male hind tibia	Absent	Present
6. Number of accessory cells in forewing	None	One, rarely two

MATERIALS AND METHODS

The data in this paper are based almost entirely on the extensive geometrid collection of the American Museum of Natural History. As one of my aims is to determine generic limits, I have not borrowed as extensively as when I require complete revisionary data for every species in each genus. By using this method it is probable that a number of interesting and valuable species and genera have been overlooked; considering the chaotic state of our knowledge of the New World Ennominae, it would be surprising if this were not so. When specific revisions are made for the South American genera reported in this paper, it may become necessary to alter the descriptions as they are given herein; this, too, is to be expected. When studying the specimens presented herein, I not only dissected and slide-mounted (in Canadian balsam) the genitalic structures, but also cleared and mounted at least one antenna and a complete set of legs of both sexes of every species available to assure that no valuable characters were missed; however, in some cases this was not possible due to lack of material or poor condition.

This is the third paper in which I have made a very detailed set of observations and analyses; the previous ones were my generic revisions of the New World Nacophorini (1983) and Bistonini (1985, based largely on Rindge, 1975). Basically the same characters were utilized in all three studies; as these were given in considerable detail for the Nacophorini (1983, pp. 148–159), they will not be repeated here. Not unsurprisingly, the results have been quite different for each of the three tribes. The largest number of apomorphic

states was found in the Nacophorini, where I utilized 13 characters on the external portions of the adults, 11 for the male genitalia, and 8 for the female genitalia (1983, tables 1–6). In the Bistonini the corresponding fig-

TABLE 2
Presence or Absence of External Characters
Numbers at tops of columns are those of Table 1.

	1	2	3	4	5	6
Section 1						
<i>Gueneria</i>	+	–	–	+	+	+
<i>Homochlodes</i>	+	–	–	+	+	+
<i>Petrophora</i>	+	–	–	+	+	±
<i>Philedia</i>	–	–	–	+	+	+
<i>Tacparia</i>	+	–	–	±	±	+
<i>Thallophaga</i>	+	+	+	–	+	+
Section 2						
<i>Acauro</i>	+	–	–	+	+	–
<i>Callemo</i>	+	+	–	–	–	±
<i>Calta</i>	–	+	–	–	+	+
<i>Catophoenissa</i>	–	–	–	–	±	±
<i>Duraglia</i>	+	+	–	–	+	–
<i>Euclidiodes</i>	+	+	+	+	±	–
<i>Franciscoia</i>	+	–	+	–	+	–
<i>Guara</i>	+	+	+	–	–	+
<i>Huechulafquenya</i>	+	+	+	?	?	±
<i>Incalvertia</i>	+	–	–	+	+	–
<i>Lacaria</i>	+	–	–	±	±	–
<i>Laneco</i>	+	+	–	+	+	–
<i>Martindoelloia</i>	+	+	+	+	+	±
<i>Nucara</i>	+	–	–	+	+	–
<i>Odontothera</i>	+	±	–	+	+	±
<i>Psilaspilates</i>	+	+	–	±	+	–
<i>Siopla</i>	+	–	–	–	+	+
<i>Yalpa</i>	+	–	–	+	+	±
<i>Yapoma</i>	+	–	–	+	+	–

Symbols: +, apomorphic state; –, plesiomorphic state; ±, both found in same taxon; ?, data not available.

TABLE 3
Nature of Male Genitalic Characters in the Lithinini

	Plesiomorphic state	Apomorphic state
7. Width of base of uncus	Less than 0.5 mm	0.5 mm or greater
8. Shape of gnathos	U- or V-shaped	W-shaped
9. Nature of valves	Simple, without projections	With costal arm or with distal costal extension
10. Cristae	Absent	Present
11. Number of cristae on each side when present	3 to less than 50	50 or more
12. Surface of processes of anellus	Bare	Setose
13. Length of aedeagus	2.0 mm or shorter	Longer than 2.0 mm
14. Spines or sclerotized rod in vesica	Present	Absent

ures were 12, 5, and 1, respectively (1985, tables 1–4).

For the present paper, my data sheets include 78 columns of observations or measurements on the external portions of the adults, 91 on the male genitalia, and 17 on the female genitalia. A number of these are presence or absence of a given structure; both have been counted in the above totals. This extensive research was done for every species in every genus available to me; the specific data were summarized on data sheets for each of the 25 genera included in this paper. As a result, I have 4650 items of data on the generic level with which to work. From all of this, I have selected six characters on the external portions of the adults, eight for the male genitalia, and six for the female genitalia. These 20 were then defined by their plesiomorphic and apomorphic states, and the data for all genera listed in a series of tables. My use of plesiomorphic and apomorphic conditions is based on some 35 years of research on the Ennominae and the resulting revisionary and descriptive publications on this subfamily; the polarities are based on the distribution of states throughout the Ennominae, as exemplified by my papers on the Nacophorini (1983) and Bistonini (1985). In nearly all cases it should be possible to determine a given species as to its genus using these 20 characters; another way of separating the genera is by making use of the keys to the adults and to the male genitalia. I strongly advise having genitalic dissections on hand when trying to make determinations; these structures, especially in

males, are more likely to possess a more useful set of characters than do other adult characters or female genitalia.

It should be noted that I make no outgroup comparisons when discussing plesiomorphic and apomorphic states because the outgroups are unknown; the only tribes that have been defined for the Neotropical Ennominae are the Nacophorini and Bistonini. The included species for these groups constitute less than one percent of the total number of described species for this subfamily. No attempt has been made to arrange the overwhelming majority of species in this subfamily into tribes. Until such work is done, utilizing modern methods of taxonomy, our knowledge of the constituent parts of the subfamily will continue to be extremely limited; hence outgroup comparisons that are attempted now will be of very little value.

If the monophyly of the Lithinini, as well as the Nacophorini and Bistonini, is dependent on one or more apomorphic characters being shared by all constituent members within each tribe, then I have failed to show this. Whether I have inadvertently overlooked one or more characters or analyzed the data incorrectly remains to be seen. What is obvious is that the genera now placed in each of these three tribes possess a remarkable range of variation in their characters; perhaps I am trying to place too many genera into a single tribe. Another possibility is that the genera are so "plastic" that it may not be feasible to define tribes by using apomorphic characters of the adults. Indeed, Forbes (1948, p. 23) utilized pupal characters as the primary

TABLE 4
Presence or Absence of Male Genital Characters
Numbers at tops of columns are those of Table 3.

	7	8	9	10	11	12	13	14
Section 1								
<i>Gueneria</i>	—	—	—	+	—	—	—	—
<i>Homochlodes</i>	—	—	—	+	+	0	—	—
<i>Petrophora</i>	—	—	+	+	—	—	±	—
<i>Philedia</i>	—	—	—	+	—	—	—	—
<i>Tacparia</i>	—	—	+	—	0	—	±	—
<i>Thallopaga</i>	—	—	—	±	—	—	—	+
Section 2								
<i>Acauro</i>	+	+	—	+	—	+	+	—
<i>Callemo</i>	—	—	+	+	—	—	—	—
<i>Calta</i>	+	—	—	+	—	—	+	+
<i>Catophoenissa</i>	+	—	—	—	0	—	+	±
<i>Duraglia</i>	+	+	—	+	—	+	—	—
<i>Euclidiodes</i>	+	+	—	+	—	+	—	—
<i>Franciscoia</i>	—	—	—	+	+	—	—	—
<i>Guara</i>	—	—	—	+	—	—	—	+
<i>Huechulafquenina</i>	?	—	—	+	?	?	?	—
<i>Incalvertia</i>	+	+	—	+	+	+	+	—
<i>Lacaria</i>	—	—	+	+	—	+	—	±
<i>Laneco</i>	+	—	—	+	+	+	+	—
<i>Martindoelloia</i>	+	—	—	+	—	—	—	—
<i>Nucara</i>	—	—	—	+	—	+	—	—
<i>Odontothera</i>	+	—	—	±	±	—	±	—
<i>Psilaspilates</i>	±	±	—	+	—	—	—	—
<i>Siopla</i>	+	—	—	+	+	+	—	—
<i>Yalpa</i>	±	—	—	+	+	—	—	—
<i>Yapoma</i>	+	+	—	+	—	—	+	—

Symbols: +, apomorphic state; —, plesiomorphic state; ±, both found in same taxon; 0, not applicable; ?, data not available.

means of differentiation for his tribal classification of the Ennominae. Studies of the eggs by Salkeld showed that the ova of the Canadian species she examined were "quite homogeneous" in shape and morphology for the Bistonini (sensu Rindge, 1985), and that the Lithinini have a great similarity in morphological features, which "suggests that they [the Lithinini] are a very homogeneous group and supports the tribal grouping" (1983, pp. 70, 110); she did not examine the Nacophorini. As far as I know, no analytical work has been done on any of the early stages for this subfamily to determine the polarity of the various characters that have been used.

The importance of studying the immature stages within a family (specifically, the Nocuidae) has been outlined by Kitching (1984, pp. 190, 191). Another recent study, on the subfamilial groups within the Nymphalidae, "suggest[s] that a solution to the seemingly

intractable problem posed by nymphalid higher classification can be sought by the application of cladistic analysis to a large data set gathered from all developmental stages, with special emphasis on detailed comparative larval morphology" (DeVries, Kitching, and Vane-Wright, 1985, p. 11). I strongly suspect that this approach will have to be followed in the Ennominae (if not the entire Geometridae) also, before we can come to any sound conclusions as to monophyletic subdivisions. However, it will be quite some time before this can be accomplished, since nothing is known about the early stages of the 50 Chilean-Argentinian species that were studied for this paper.

SYSTEMATIC DESCRIPTIONS

From a purely utilitarian point of view I have divided the taxa into two sections: the first includes genera from North America, and

1. Uncus short, 0.3–0.5 mm long 2
 Uncus elongate and slender, 0.6–0.9 mm long
 3
 2(1). Vesica unarmed *Thallopgha*
 Vesica with prominent spines .. *Gueneria*
 3(1). Anellus processes absent; cristae prominent,

- very numerous, and elongate, about 1.0 mm long *Homochlodes*
 Anellus processes in form of sclerotized arms; cristae not prominent or absent, when present 0.2–0.3 mm long 4
 4(3). Each valve with swollen costal process or slender arm 5
 Each valve with simple costa *Philedia*
 5(4). Each valve with swollen costal process ...
 *Petrophora*
 Each valve with slender costal arm
 *Tacparia*

BASED ON FEMALE GENITALIA

1. Signum absent *Gueneria*
 Signum present 2
 2(1). Ductus bursae twice as long as wide ... 3
 Ductus bursae with length either equal to width or shorter 4
 3(2). Apophyses posteriores 0.6–1.0 mm in length
 *Homochlodes*
 Apophyses posteriores 1.2–1.4 mm long ..
 *Philedia*
 4(2). Corpus bursae with posterior end sclerotized and longitudinally striate 5
 Corpus bursae with posterior end membranous and nonstriate *Thallopaga*
 5(4). Apophyses posteriores 0.6–0.8 mm in length
 *Petrophora*
 Apophyses posteriores 1.2–1.3 mm long ..
 *Tacparia*

GENUS *PHILEDIA* HULST

Figures 1, 29, 55

Philedia Hulst, 1896, p. 343. Rupert, 1949, p. 138, pl. 11, figs. 1, 1a (male genitalia).

DIAGNOSIS: This is the only genus in North America in which the males have pectinate antennae. The upper surface of the forewings is a pale gray with the t. p. line represented by dark spots or dashes on the veins and with a somewhat nebulous, strongly outcurved t. a. line; the hind wings are whitish with dots on the veins representing the extradiscal line. The male genitalia have a slender uncus, a weakly represented cristae with from 6 to 10 short setae on each side, 0.3 mm long, the processes of the anellus are long, slender, and end in a point, and the vesica has a single large spine half the length of the aedeagus. The female genitalia have a median attachment of the apophyses to the papillae anales, an elongate ductus bursae, the corpus bursae is about twice the length of the apophyses posteriores, and the signum is a slender, transverse, indented strip 0.6 mm long.

TABLE 6
 Presence or Absence of Female Genitalic Characters

Numbers at tops of columns are those of Table 5.

	15	16	17	18	19	20
Section 1						
<i>Gueneria</i>	—	—	+	—	+	0
<i>Homochlodes</i>	—	—	+	—	—	+
<i>Petrophora</i>	—	+	+	+	—	+
<i>Philedia</i>	+	—	—	+	—	+
<i>Tacparia</i>	+	+	+	+	—	±
<i>Thallopaga</i>	—	±	+	—	—	+
Section 2						
<i>Acauro</i>	—	±	+	+	—	—
<i>Callemo</i>	—	+	+	+	—	+
<i>Calta</i>	—	+	+	+	+	0
<i>Catophoenissa</i>	—	±	±	±	±	—, 0
<i>Duraglia</i>	—	—	—	+	—	—
<i>Euclidiodes</i>	+	±	+	+	—	—
<i>Franciscoia</i>	+	—	+	+	—	—
<i>Guara</i>	—	—	—	—	—	+
<i>Huechulafquenina</i>	—	+	+	+	+	0
<i>Incalvertia</i>	±	—	+	+	—	—
<i>Lacaria</i>	+	±	±	+	—	—
<i>Laneco</i>	—	+	+	+	+	0
<i>Martindoelloia</i>	—	+	+	+	—	+
<i>Nucara</i>	—	+	+	+	—	—
<i>Odontothera</i>	—	—	±	—	+	0
<i>Psilaspilates</i>	—	+	+	±	—	—
<i>Siopla</i>	—	+	—	+	—	—
<i>Yalpa</i>	—	+	+	—	+	0
<i>Yapoma</i>	—	+	+	+	—	—

Symbols: +, apomorphic state; —, plesiomorphic state; ±, both found in same taxon; 0, not applicable.

ADULTS: Head with large eyes, each eye almost as wide as width of front, eyes of both sexes of equal size; front slightly swollen, extending beyond eyes by one-fourth diameter of eyes, tightly scaled, without ventral tuft; palpi barely exceeding front, second segment 0.3 mm long, third segment 0.2 mm long; antennae of approximately 52 to 54 segments, pectinate in males, pectinations arising basally on their segments, with about eight simple segments terminally, longest pectinations 0.45 mm long, being 1.5 times longer than their basal segments; antennae simple in females. Thorax slender; foretibia of males with epiphyses arising at three-fifths length of segment and being slightly more than two-fifths its length, of females arising at seven-tenths length and being about one-third length

of segment; hind tibia of males with hair pencil. Abdomen slender, extending to hind margin of hind wings; males with row of setae on ventral surface of third segment.

Forewings broad, outer margin rounded and smooth; with one accessory cell; vein R_1 free, R_2 from near end of cell, R_{3+4} from end of cell, R_5 from bottom of cell; mdc and ldc angled. Hind wings broad; Sc paralleling R for almost one-half length of cell; m and ldc angled.

Upper surface of forewings unicolorous pale gray or pale brownish gray; t. a. line obsolescent, deeply curved into cell, represented by dark streaks; discal dot present; t. p. line represented by short, dark venular dashes; terminal line black, broadly interrupted by veins; fringe concolorous with wing; hind wings unicolorous whitish, with extradiscal line indicated by dark venular dashes; fringe concolorous with wing. Under surface of forewings unicolorous pale gray, with discal dot and t. p. line weakly indicated; hind wings unicolorous pale grayish white, with discal spot and extradiscal line weakly represented.

Length of Forewings: Males, 16 to 19 mm; females, 17 to 21 mm.

MALE GENITALIA: Uncus elongate, slender, 0.6 to 0.7 mm long, with base 0.4 to 0.5 mm wide, apical portion with parallel sides, apex with single point; socius shortly digitate, with approximately 15 setae on each one; gnathos elongate, about equal in length to uncus, V-shaped posteriorly with sides broad, becoming slender and more sclerotized anteriorly, apical portion with sides broadly connected, terminating in thick posteroventrally directed point having minute denticulations on lateral and anterior surfaces; valves simple, with broadly sclerotized costa; transstilla prominent, posterior margin straight, anterior margin deeply bilobed; processes of anellus heavily sclerotized, 0.7 mm long, each arising from broad diagonal base, then extending posteriorly, apex simple, terminating in sharp point; anellus rounded anteriorly, extending posterodorsally to bases of processes; cristae arranged in row, 6 to 10 on each side, 0.3 mm long; tegumen with short median fusion; saccus longer than tegumen, broadly rounded apically; aedeagus 1.55 to 1.70 mm long, 0.25 mm wide, with parallel sides, posterior end tapering to blunt point, with apical region sclerotized; vesica with

single, elongate, slender sclerotized piece, 0.8 mm long.

FEMALE GENITALIA: Sterigma without clearly defined lamella antevaginalis, lamella postvaginalis subrectangular, sclerotized, posterior portion minutely striate transversely; ductus bursae weakly sclerotized, twice as long as wide, anterior end slightly swollen; ductus seminalis arising from small sac located ventrally at junction of ductus bursae and corpus bursae; corpus bursae with posterior half tapered and having longitudinal striations, anterior end swollen, ovate, corpus bursae twice as long as apophyses posteriores; signum prominent, transverse, linear, invaginated, 0.4 to 0.6 mm long. Papillae anales with median attachment for apophyses; apophyses posteriores 1.2 to 1.4 mm long, apophyses anteriores 0.5 to 0.7 mm.

EARLY STAGES: Undescribed.

FOOD PLANT: Dyar (1904, p. 909) said the larvae fed "on the common brake (*Pteris*)" in British Columbia. McFarland (1975, p. 118) stated that "captive larvae avidly accepted young leaves of bracken, *Pteridium aquilinum* (Linnaeus) Kuhn" (Pteridaceae) in western Oregon. These two references may refer to the same fern, which occurs from northwestern Mexico to Alaska (Munz, 1973, p. 32).

TYPE SPECIES: *Cleora punctomacularia* Hulst; by original designation.

DISTRIBUTION: Western North America, from British Columbia and Idaho south to central California, west of the Cascade Range.

FLIGHT PERIOD: From mid-August until early November.

REMARKS: The only included species, with two subspecies, has been studied.

GENUS *PETROPHORA* HÜBNER

Figures 2, 30, 56

Petrophora Hübner, "1806" [1811], vol. 1, pl. [207].

Ortholitha Hübner, 1821, p. [3].

Lithina Hübner, "1816" [1825], p. 338. Forbes, 1948 (in part), pp. 88, 89.

Lozogramma Stephens, 1829, p. 44. Packard, 1876 (in part), p. 245, pl. 2, fig. 17a (venation).

DIAGNOSIS: The forewings may either be without an accessory cell or appear so, having a small, short, and weak cross vein forming the cell. The upper surface of the forewings is pale brown or pale reddish brown and has

two prominent, almost straight cross lines; the hind wings are paler than the forewings and have an obsolescent to weakly represented extradiscal line. The male genitalia are distinguished by a protruding costal swelling, and by each of the processes of the anellus terminating in a simple point; the female structures have an elongate corpus bursae that is both sclerotized and striate posteriorly and a denticulate transverse strip that forms the signum.

ADULTS: Head with large eyes, each eye almost as wide as width of front, eyes of both sexes of equal size; front protruding short distance beyond eyes, slightly swollen, tightly scaled, with or without small ventral tuft; palpi barely exceeding front, second segment 0.4 to 0.6 mm long, third segment 0.2 to 0.3 mm long; antennae of approximately 56 to 71 segments, simple in both sexes, males shortly ciliate. Thorax slender; foretibia of males with epiphysis arising at or about three-fifths length of segment and between two-fifths and one-half of foretibia length, of females arising between three-fifths and two-thirds length of segment and being two-fifths length of segment; hind tibia of male with hair pencil. Abdomen slender in males and extending beyond hind wings, thicker in females and reaching hind margin of hind wings; males with row of setae on ventral surface of third segment.

Forewings broad, apex pointed, outer margin relatively straight to rounded, smooth; without accessory cell or apparently so, when present with small, short, weak cross vein forming cell; vein R_1 from R_s , R_2 either free or from end of cell, R_{3+4} either long stalked or from end of cell, R_5 from either R_{3+4} or from near end of cell; mdc and ldc weakly biconvex. Hind wings broad; Sc paralleling R for from one-third to two-fifths length of cell; m and ldc either weakly biconvex or curved.

Upper surface of forewings pale brown or pale reddish brown, with median area very slightly paler than basal and outer areas; t. a. and t. p. lines prominent, almost straight; with small discal spot; terminal line absent or very slender, complete; fringe concolorous with wing; hind wings somewhat paler than forewings, with or without discal dot, and with obsolescent to weakly represented extradiscal line; terminal line and fringe similar

to those of forewings. Under surface of wings gray, irrorate with brown or pale reddish brown, all wings with small discal dots and outer cross lines.

Length of Forewings: Males, 14 to 18 mm; females, 15 to 18 mm.

MALE GENITALIA: Uncus slender, 0.6 to 0.8 mm long, with base 0.30 to 0.45 mm wide, either simple, slightly constricted medially, posteroventrally flat to weakly concave, apex rounded, or more slender, without median constriction, with terminal portion angled ventrally at approximately right angle, ventrally projecting section elongate, posteriorly setose, apically rounded; socius very small, with five or six setae on each side; gnathos V-shaped, elongate, slightly longer than uncus, sides of equal width, apical portion with sides broadly connected, apex either with small dorsal bend and median line of small teeth or attenuate and curving ventrally; valves simple except for modified costa, latter sclerotized, either slender, extending beyond middle of valve and projecting as small knob or as short, broad projection, concave ventrally and forming prominent rounded lobe just basad of middle of valve; transtilla either a simple tube or swollen laterally and constricted medially; processes of anellus tubelike, slightly curved, 0.4 to 0.5 mm long, each arising from posterolaterally directed, elongate structure, each process of same width for entire length, slender, apically rounded; anellus with length approximately equal to width, anteriorly rounded; cristae arising from elliptical patch, approximately 25 to 30 on each side, 0.20 to 0.25 mm in length; tegumen with short, posteriorly located median fusion; saccus longer than tegumen, broad, ventrally truncate; aedeagus 1.8 to 2.1 mm long, 0.3 mm wide, dorsoventrally curved, posterior end bluntly pointed and with edges weakly sclerotized; vesica with either one slender, very long spine, almost as long as aedeagus, or with three short, thick spines and two or three very slender spines, with their combined length less than half length of aedeagus. (The Palearctic species *chlorosata* Scopoli has a contiguous row of numerous thick spines more than half length of aedeagus.)

FEMALE GENITALIA: Two types represented: *divisata* with ostium bursae membranous, funnel-shaped; ductus bursae clearly

defined, small, lightly sclerotized, widest anteriorly, with length approximately equal to width, being 0.2 mm; corpus bursae with very long, slender, somewhat S-shaped, sclerotized, longitudinally striate posterior portion, and with small, ovate, membranous anterior part, corpus bursae 7 to 10 times longer than apophyses posteriores. *Subaequaria* without ostium bursae; ductus bursae heavily sclerotized, scarcely differentiated from corpus bursae, having median semicircular area and pair of anterolateral, slightly curved, tubelike processes, approximately 0.8 mm wide and long; corpus bursae with short, broad, sclerotized, weakly longitudinally striate posterior portion extending posterolaterally to right of junction with ductus bursae, and with large, elongate, ovoid, membranous anterior part, corpus bursae five times as long as apophyses posteriores. Both types with sterigma not differentiated; ductus seminalis arising on right side near junction of ductus bursae and corpus bursae; signum prominent, transverse, elongate elliptical, with minutely denticulate surface, 0.5 to 1.0 mm long. Papillae anales small, slender, with anterior attachment for apophyses; apophyses posteriores 0.60 to 0.75 mm long, apophyses anteriores 0.35 to 0.60 mm in length. (The Palearctic *chlorosata* has a funnel-shaped ostium bursae, a small ductus bursae, and the shorter, broader type of corpus bursae.)

EARLY STAGES: The last instar larva of *subaequaria* (Walker) has been described by Forbes (1948, p. 89) and Rupert (1949, p. 145). The latter author gave a note on oviposition and described the pupa in the same article.

FOOD PLANTS: Ferns. Rupert (1949) reared *subaequaria* on the common brake (*Pteridium*), and the Palearctic *chlorosata* also feeds upon brakes. Adult *divisata* (Hübner) have been taken in the vicinity of *Osmundia cinnamomea* Linnaeus, and this fern might be the food plant of this species (Rupert, op. cit.).

Grass has been cited as a food plant of *defluata* (Walker), a synonym of *subaequaria*; this was based on the statement, "raised from long larva swept from coarse grass, etc., on edge of woods" (Bruce, 1887, p. 48). From this, it must have been assumed that the larva fed on grass, even though this is not explicitly stated; unless proven otherwise, grasses

should not be listed as food plants for this genus of moths.

TYPE SPECIES: For *Petrophora*, *P. divisata* Hübner; by monotypy. For *Ortholitha*, *P. divisata* Hübner; by monotypy. For *Lithina*, *Geometra petraria* Hübner; by subsequent designation by Hampson (1896). For *Lozogramma*, *Geometra petraria* Hübner; by monotypy.

Hence *Ortholitha* is a junior objective synonym of *Petrophora*, as is *Lozogramma* of *Lithina*. *Petraria* is a junior subjective synonym of *chlorosata* Scopoli, and this species is considered to be congeneric with *divisata*.

DISTRIBUTION: Holarctic. In eastern North America, from Wisconsin and Manitoba to Nova Scotia, south to Florida and Mississippi along the Eastern Seaboard states east of the Appalachian Mountains.

FLIGHT PERIOD: Northern specimens are on the wing from late April into June; specimens in Florida and Mississippi begin flying as early as March. Apparently both species have a single generation per year.

REMARKS: Both North American species have been studied, as well as the Old World *chlorosata*.

GENUS *TACPARIA* WALKER

Figures 3, 31, 32, 57, 58

Tacparia Walker, 1860, p. 233. Rupert, 1949, p. 147, pl. 11, figs. 6, 6a, 8 (male, female genitalia), pl. 12, figs. 1, 1a, 10a, 10b (male genitalia, venation). Ferguson, "1973" [1974], p. 467, figs. 1-20 (adults, male, female genitalia).

Apaeasia Hulst, 1896, p. 147. Rupert, 1949, p. 147 (synonym of *Tacparia*).

Lozogramma (misidentification): Packard, 1876, p. 243.

Lithina (misidentification): Forbes, 1948, p. 88, fig. 47 (venation).

DIAGNOSIS: The antennae have between 63 and 71 segments, the greatest number in the North American genera. The upper surface of the forewings varies from gray, more or less heavily irrorate with brown, to dark brown, with the two cross lines rather weakly indicated; the hind wings are either slightly paler than, or concolorous with, the forewings, and have a somewhat diffuse extradiscal line. The male genitalia have a long, slender uncus, numerous setae on the socius, distinct costal arms, lack cristae, and have two sets of processes of the anellus. The female genitalia have the corpus bursae with

the posterior region both sclerotized and striate, and elongate (1.2–1.3 mm) apophyses posteriores.

ADULTS: Head with large eyes, each eye either equal to or slightly smaller than width of front, eyes of both sexes equal in size or those of females slightly smaller; front slightly swollen, extending slightly beyond eyes, tightly scaled, with well-defined ventral tuft of scales; palpi extending beyond eyes by up to one-third diameter of eye, second segment 0.4 to 0.7 mm long, third segment 0.2 to 0.4 mm long; antennae of approximately 63 to 71 segments, simple in both sexes, minutely setose below in males. Thorax slender; foretibia of males with epiphysis arising between one-half and three-fifths length of segment and being two-fifths to one-half segment length, of females arising at three-fifths length of segment and being two-fifths or slightly longer than segment length; hind tibia of males with or without hair pencil. Abdomen slender in males, stouter in females, extending to or just beyond hind wings; males with or without row of setae on ventral surface of third segment.

Forewings broad, apex pointed, outer margin rounded or slightly concave below apex, smooth; with one accessory cell; vein R_1 from R_s , both R_2 and R_{3+4} from end of cell, R_5 from bottom of cell; mdc and ldc biconvex. Hind wings broad; Sc paralleling R for about half length of cell; m and ldc rounded.

Upper surface of forewings varying from gray, more or less heavily irrorate with brown, to dark brown; t. a. line obsolescent or weakly represented, evenly curved or straight; median shade line absent; discal dot, when present, small; t. p. line represented by small, dark venular dots, variably connected or shaded basally by brown band; terminal line either absent or weakly represented by small brown intravenular dots; fringe concolorous with wing; hind wings either slightly paler than, or concolorous with, forewings, having somewhat diffuse extradiscal line; terminal line and fringe as on forewings. Under surface evenly gray or brown, wings concolorous or forewings slightly darker than hind wings; maculation, when present, consisting of small discal dots and outer cross lines; terminal line and fringe similar to those of upper surface.

Length of Forewings: Males, 13 to 18 mm; females, 14 to 18 mm.

MALE GENITALIA: Uncus elongate, slender, 0.8 to 0.9 mm long, base 0.35 to 0.40 mm wide, weakly constricted posteriad of base, slender median portion with variable number of dorsal and lateral setae, apex pointed; socius elongate, each with approximately 20 to 30 setae; gnathos either U-shaped and with elongate, slender median projection, or V-shaped, with dorsal thickening near transtilla, apically attenuate; valves with prominent basal costal arm, either lobate, shortly spined, and reaching to base of uncus, or long, slender, curved, with median and apical spinning, and extending to middle of uncus, each costa more or less sclerotized distad of arm; transtilla either very wide, flat, equal in length to length of tegumen, and with median constriction, or much smaller, with median area enlarged; processes of anellus double, outer pair elongate, 0.8 to 1.1 mm long, slender, bare or with various setae and spines, inner pair short, 0.5 to 0.8 mm long, slightly wider than outer pair, with apical region either enlarged or with elongate setae; anellus located dorsally, anterior margin rounded; cristae absent; tegumen with single point of median fusion; saccus about twice as long as tegumen, tapered, anterior end bluntly rounded; aedeagus 1.8 to 2.9 mm long, 0.4 mm wide, either with parallel sides and pointed posterior end or wedge-shaped, posterior end sclerotized; vesica variously armed, with sclerotized piece having many short deciduous spines, with the preceding plus several thick spines, or with row of numerous, short, overlapping spines, row approximately half length of aedeagus; vesica of first two types, when exerted, short, broad and extending dorsally.

FEMALE GENITALIA: Sterigma with lamella antevaginalis heavily sclerotized, either a slender strip or broad band having postero-median incision and lateral raised plates, lamella postvaginalis sclerotized, with or without lateral extensions and median striate area; sterigma, ostium bursae, and ductus bursae variously combined, often indistinguishable; ductus bursae, when distinct, heavily sclerotized, short, with length approximately equal to width; ductus seminalis arising from small sac located ventrally near junction of ductus bursae and corpus bursae; corpus bursae varying from relatively short and broad to long and slender, posterior end sclerotized,

with longitudinal striations, either poorly defined and short or clearly defined and longer than anterior part, anterior portion elongate, ovate, or shoe-shaped, membranous, surface striate and with minute, inwardly pointing spines, corpus bursae three to six times as long as apophyses posteriores; signum prominent, transverse, surface minutely striate or variably dentate, elongate lunate, and obliquely indented, 0.9 to 1.1 mm long. Papillae anales small, slender, with median attachment for apophyses; apophyses posteriores 1.2 to 1.3 mm long, apophyses anteriores 0.20 to 0.35 mm.

EARLY STAGES: Larval and pupal notes have been published by Forbes (1948, p. 88), Rupert (1949, pp. 149, 150, pl. 12, fig. 12), and Ferguson ("1973" [1974], p. 476) for two of the three species.

FOOD PLANTS: *Alnus rugosa* (Du Roi) Spring (Fagaceae) for *T. deterrenta* (Guenée); "larva on birch (Lemmer)," for *T. zalissaria* Walker (Forbes, 1948), but this needs to be verified (Ferguson, "1973" [1974], p. 473); *Myrica gale* Linnaeus (Myricaceae) for *T. atropunctata* (Packard) (Ferguson, "1973" [1974], p. 476; 1975, p. 28).

TYPE SPECIES: For *Tacparia*, *T. zalissaria* Walker; by monotypy. Walker had two species included in the four specimens to which he applied the above name; two, "a" and "b," are said to be the Australian *Idoides apicata* Guenée, while "c" and "d" were without locality data. Ferguson ("1973" [1974], p. 470) designated one of the last two as the lectotype, and this is the species found in the southeastern United States. Earlier, Rupert (1949, p. 150) realized that Walker's type series was of two species, but his lectotype designation gave no clear indication as to which specimen the designation pertained, so Ferguson redesignated the same moth.

For *Apaecasia*, *Tephрина deterrenta* Guenée; by original designation. As *detersata* is considered to be congeneric with *zalissaria*, *Apaecasia* becomes a junior subjective synonym of *Tacparia*.

DISTRIBUTION: Eastern North America, from Wisconsin and Manitoba to Nova Scotia, south to Florida, being east of the Appalachian Mountains, and west to Mississippi and eastern Texas. Forbes (1948) and Rupert (1949) stated that *detersata* extends west to British Columbia; Ferguson ("1973"

[1974]) said it reaches Alberta. As indicated, I have not seen any material from west of the mid-continent, but Ferguson could very well be correct.

FLIGHT PERIOD: May to early July in the north, indicating a single generation per year. In the south, *zalissaria* begins flying in February and March.

REMARKS: All three included species have been studied.

GENUS *GUENERIA* PACKARD

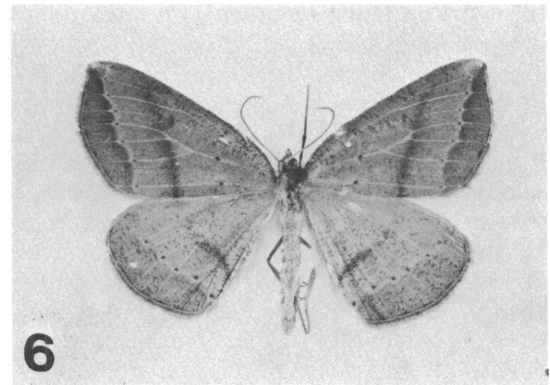
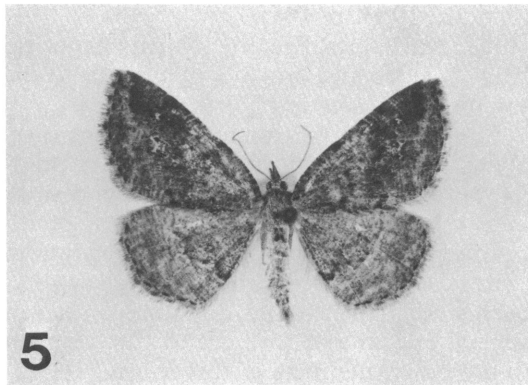
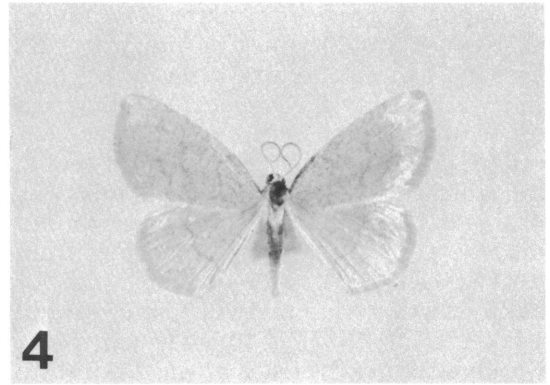
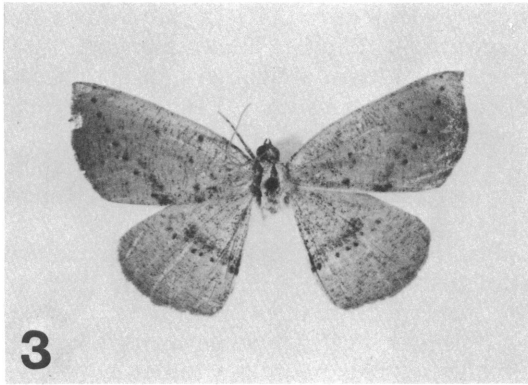
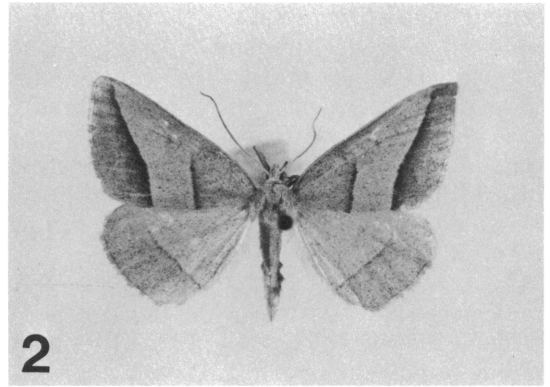
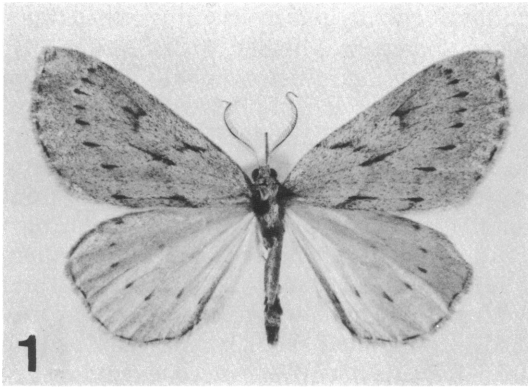
Figures 4, 33, 59

Gueneria Packard, 1876, p. 307, pl. 3, fig. 11 (venation). Gumpfenberg, 1892, p. 277 (as synonym of *Cabira* [sic] = *Cabera*). Hulst, 1896, p. 326. Forbes, 1948, p. 89. Rupert, 1949, p. 141, pl. 11, figs. 6, 6a (male genitalia), pl. 12, fig. 5 (venation).

DIAGNOSIS: This is the only genus in North America in which the adults have white wings, and the males have a fovea on the upper side of the forewings near the base. The male genitalia have a very short triangular uncus, with its length being about equal to the width of its base. The female genitalia are distinctive in that they lack the signum, but have the dorsal surface of the corpus bursae broadly sclerotized; they also have a large, medially constricted, anteriorly directed saclike appendage arising from the left side of the corpus bursae.

ADULTS: Head with large eyes, each eye about as wide as width of front, eyes of both sexes of equal size; front flat, tightly scaled, with minute ventral tuft; palpi barely exceeding front, second segment 0.4 mm long, third segment 0.1 mm long; antennae of approximately 49 to 58 segments, simple in both sexes, males minutely setose below. Thorax slender; foretibia with epiphysis of both sexes arising at about three-fifths length of segment and being between two-fifths and one-half its length; hind tibia of males with hair pencil. Abdomen slender, thinner and longer in males than in females; males with row of setae on ventral surface of third segment.

Forewings broad, apex pointed, outer margin rounded, smooth; with one or two accessory cells; veins R_1 and R_2 arising from top of cell, R_{3+5} stalked, from end of cell, R_5 branching off before R_4 ; mdc and ldc biconvex; males with large fovea on upper side near



FIGS. 1–6. Adult males from North America. 1. *Philedia punctomacularia* (Hulst), Robson, British Columbia, September 13, 1938 (H. R. Foxlee). 2. *Petrophora divisata* Hübner, Ocean Co., New Jersey, May 14, 1944 (O. Buchholz). 3. *Tacparia zalissaria* Walker, Port Sewall, Florida, February 19, 1938 (L. C. Sanford). 4. *Gueneria similaria* (Walker), nr. Beartown, Vermont, June 2, 1951 (F. H. Rindge). 5. *Homochlodes fritillaria* (Guenée), New Canaan, Connecticut, May 8, 1951 (M. Statham). 6. *Thallophaga taylorata* (Hulst), 2 mi E Elsie, Oregon, June 12–13, 1964 (S. G. Jewett, Jr.). All AMNH; $\times 1.65$.

base of cubital cell, covered with elongate scales. Hind wings broad; Sc paralleling R for about two-fifths length of cell; m and ldc straight.

Upper surface of all wings unicolorous

white, finely speckled with pale yellowish brown scaling; fore- and hind wings concolorous, or with hind wings having fewer dark scales; maculation obsolescent, with t. a., median, t. p., and extradiscal cross lines weakly

represented when present; terminal line absent; fringes concolorous with wings. Under surface of all wings unicolorous white, having fewer darker scales than on upper surface and with shinier scaling; maculation usually absent, some specimens with t. p. and extradiscal lines represented.

Length of Forewings: Males, 11 to 13 mm; females, 12 to 14 mm.

MALE GENITALIA: Uncus triangular, 0.3 mm long, base 0.35 mm wide, tapering posteriorly, the sides biconcave, apex with single point; socius small, padlike, with approximately six setae on each one; gnathos V-shaped, very slightly longer than uncus, sides of equal width, apical portion with sides broadly connected, ventral surface finely dentate; valves simple, elongate, extending posteriorly just beyond uncus, with slender sclerotized costa, terminating in slight point; transtilla with median constriction; processes of anellus becoming more heavily sclerotized distally, 0.8 mm long, each arising from weakly sclerotized base, of same width for entire length, terminating in row of several slender spines; anellus rounded anteriorly, weakly sclerotized; cristae arising from elliptical patch, approximately 20 on each side, 0.2 to 0.3 mm long; tegumen with single point of median fusion; saccus about twice as long as tegumen, broad, with anteromedian indentation; aedeagus 1.3 mm long, 0.3 mm wide, with parallel sides, posterior end shortly tapered and ending in blunt point, not more sclerotized than remainder of aedeagus; vesica with elongate, broad, flat sclerotized piece having about six slender spinelike processes at posterior end, and with two or three tightly grouped thick spines on right side of sclerotized piece, slightly shorter than piece.

FEMALE GENITALIA: Sterigma not differ-

entiated; ostium bursae very large, three times longer than ductus bursae, widest posteriorly, evenly tapering to junction with ductus bursae, ventral surface minutely spiculate, dorsal side with some longitudinal ridges anteriorly; ductus bursae sclerotized, rounded, slightly wider than long; ductus seminalis arising from small sac ventrally at junction of ductus bursae and corpus bursae; corpus bursae swollen, ovoid, dorsal surface broadly sclerotized, and with prominent, elongate, membranous, medially constricted saclike appendage arising from left side of corpus bursae, extending anteriorly beyond corpus, corpus bursae three times as long as apophyses posteriores; signum absent. Papillae anales elongate, slender, with anterior attachment for apophyses; apophyses posteriores 1.0 to 1.1 mm long, apophyses anteriores 0.7 to 0.8 mm.

EARLY STAGES: Descriptions of both the last instar larva and pupa are given by Rupert (1949, p. 142).

FOOD PLANT: *Dryopteris novaboracensis* (Linnaeus) Swartz, a fern (Forbes, 1948, p. 90; Rupert, 1949, p. 142).

TYPE SPECIES: *Ellopiia basiaria* Walker; by monotypy. This name is a junior subjective synonym of *Acidalia similaria* Walker (Rindge, 1953, p. 141).

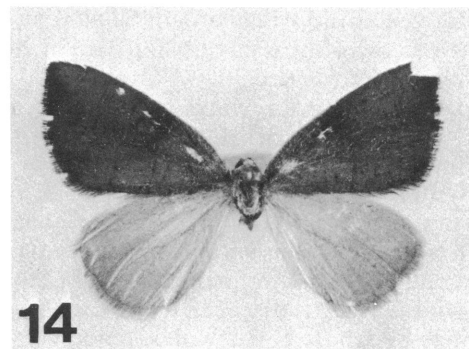
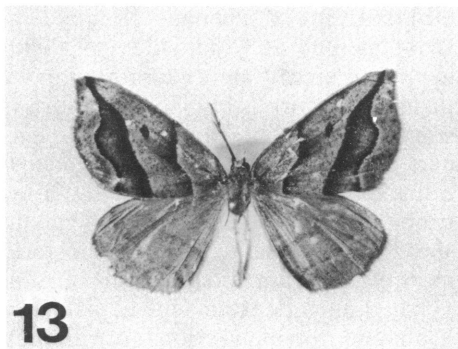
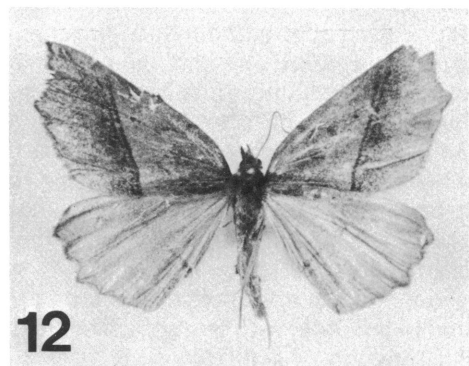
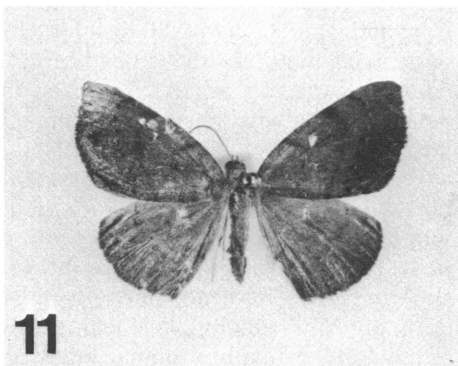
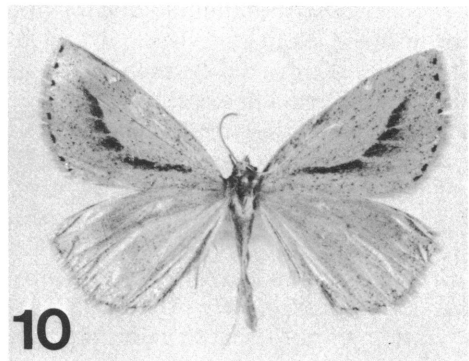
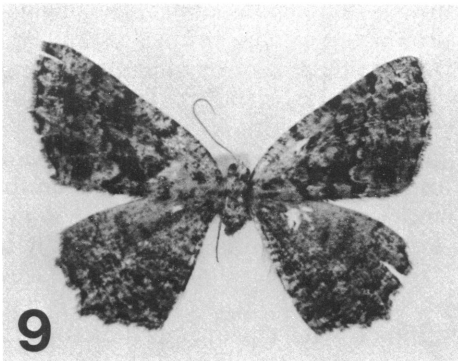
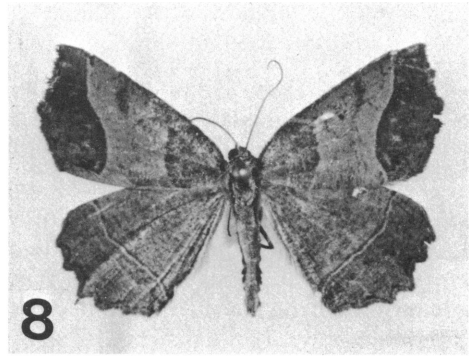
DISTRIBUTION: Eastern North America, from Quebec and Nova Scotia south to the mountains of western North Carolina.

FLIGHT PERIOD: From late April into early September. The majority of specimens studied were caught in late spring and early summer; the few late July, August, and September dates indicate a partial second generation.

REMARKS: The one included species has been studied. The adults are more similar in general appearance to those of *Cabera* than to the other members of this tribe.

→

FIGS. 7-14. Adult males from South America. 7. *Yalpa dalcachue*, new species, holotype, Dalcachue, Chile, February 12, 1973 (L. E. Peña). 8. *Odontothera valdiviata* (Felder and Rogenhofer), El Manzano, Chile, January 22, 1977 (L. E. Peña). 9. *Odontothera virescens* Butler, Las Trancas, Chile, February 7-12, 1966 (L. E. Peña). 10. *Psilaspilates signistriaria* Butler, Las Trancas, December 14-15, 1976 (L. E. Peña). 11. *Callemo monotonos*, new species, paratype, Las Trancas, Chile, January 24-30, 1983 (L. E. Peña). 12. *Martindoelloia juradoi* Orfila and Schajovskoy, Aguas Calientes, Chile, December 17-20, 1981 (L. E. Peña). 13. *Guara raphis*, new species, holotype, El Chinque, Chile, January 22, 1980 (L. E. Peña). 14. *Siopla derance*, new species, holotype, Las Trancas, Chile, December 1-15, 1976 (L. E. Peña). All AMNH; $\times 1.65$.



GENUS *HOMOCHLODES* HULST

Figures 5, 34, 60

Homochlodes Hulst, 1896, p. 339. Forbes, 1948, p. 89, fig. 48 (venation). Rupert, 1949, p. 142, pl. 11, figs. 4, 4a, 7 (male, female genitalia), pl. 12, fig. 6 (venation).

DIAGNOSIS: This is the only genus in North America in which the forewings have two accessory cells. The upper surface of all wings is a finely mottled brown with indistinct cross lines. The male genitalia are distinguished by the elongate U-shaped gnathos, by the lack of the processes of the anellus, and by the thick, prominent, elongate cristae; in the female structures the ductus bursae is twice as long as wide and the sides are parallel.

ADULTS: Head with large eyes, each eye almost as wide as width of front, eyes of both sexes of equal size; front slightly swollen, tightly scaled, without ventral tuft; palpi barely exceeding front, second segment 0.4 to 0.6 mm long, third segment 0.1 to 0.3 mm; antennae of approximately 57 to 63 segments, simple in both sexes, males varying from cylindrical to prismatic and shortly setose. Thorax slender; foretibia in males with epiphysis arising at or near three-fifths length of segment and being one-half its length; in females arising at three-fifths length of segment and being two-fifths to slightly less than one-half its length; hind tibia of males with hair pencil. Abdomen slender, extending to or just beyond hind margin of hind wings; males with row of setae on ventral surface of third segment.

Forewings broad, apex pointed, outer margin rounded, smooth; with two accessory cells; vein R_1 from top of cell, R_2 and R_{3+4} from end of cell, R_5 from bottom of cell; mdc and ldc biconvex. Hind wings broad; Sc paralleling R from two-fifths to one-half length of cell; m and ldc rounded.

Upper surface of forewings finely mottled brown, unicolorous or slightly variegated; cross lines indistinct or obsolescent, sometimes with white patch of varying size in middle of t. p. line; terminal line of intravenular dots; fringe concolorous with wing; hind wings either concolorous with forewings or slightly paler, with faint extradiscal line; terminal line and fringe like those of forewings. Under surface of forewings grayish brown, of hind wings

paler, more grayish; all wings with discal dots and outer cross line represented by venular dots.

Length of Forewings: Males, 13 to 16 mm; females, 14 to 17 mm.

MALE GENITALIA: Uncus slender, 0.6 to 0.7 mm long, base 0.20 to 0.25 mm wide, shaft slightly constricted medially, apical region with posterodorsal keel, apex rounded; socius minute, with approximately five setae on each side; gnathos long and slender, in length about equal to length of uncus, U-shaped, apical portion slightly swollen, ventral surface minutely denticulate and with single central projection; valves simple, extending posteriorly to basal portion of uncus, with slender, curved sclerotized costa, terminating in slightly projecting point; transtilla tubular, with anteromedian curve; processes of anellus absent but with subtriangular to ovate smoothly sclerotized basal plate on each side forming anellus; cristae very prominent, arising from band having about 50 setae on each side, with setae being 1.0 to 1.1 mm long; tegumen with short, poorly defined area of posteromedian fusion; saccus slightly longer than tegumen, with anteromedian indentation; aedeagus 1.35 to 1.70 mm long, 0.3 mm wide, with parallel sides, apex bluntly pointed, not noticeably more sclerotized than aedeagus; vesica with single thick spine, 0.3 mm long.

FEMALE GENITALIA: Sterigma with membranous lamella antevaginalis, lamella postvaginalis lightly sclerotized, semicircular, posterior margin tending to be straight, slightly raised, and more heavily sclerotized than anterior portion, ventral surface minutely setose; ostium bursae membranous, funnel-shaped; ductus bursae sclerotized, lateral margins thickened, elongate, slender, twice as long as wide, sides parallel; ductus seminalis arising at or near junction with corpus bursae; corpus bursae with short, twisted, sclerotized longitudinally striate posterior end, anterior portion much larger, membranous, ovate, entire corpus bursae four to five times longer than apophyses posteriores; signum prominent, situated posteriorly in membranous portion of corpus bursae, transverse, finely dentate, either a flat strip or V-shaped in cross section, approximately 1.0 mm long. Papillae anales small, with anterior

attachment for apophyses; apophyses posteriores 0.6 to 1.0 mm long, apophyses anteriores 0.30 to 0.35 mm.

EARLY STAGES: The final instar larva and pupa have been described by Forbes (1948, p. 89) and Rupert (1949, p. 143, pl. 12, fig. 11 [pupa]).

FOOD PLANTS: Ferns, with some preference for the common brake (*Pteridium*) (Rupert, 1949). Both *fritillaria* and *lactispargaria* utilize *P. aquilinum* Linnaeus in Nova Scotia (Ferguson, 1975, pp. 27, 28).

TYPE SPECIES: *Numeria fritillaria* Guenée; by original designation.

DISTRIBUTION: Eastern North America, from Wisconsin and Manitoba to Nova Scotia, south to West Virginia and the mountains of western North Carolina. Rupert (1949) reported the range as extending into Florida; Kimball (1965, p. 186) did not give any records for that state, and so that record should be considered as dubious.

FLIGHT PERIOD: From mid-April until mid-August. Most moths are caught in the spring and early summer months, but a partial second generation does occur.

REMARKS: All three known species have been studied. All literature references to *fritillaria* need to be checked, as it wasn't until very recently that two additional species were recognized. These last two are very similar in appearance to *fritillaria* and can be easily confused with it.

GENUS *THALLOPHAGA* HULST

Figures 6, 35, 61

Anthelia Hulst, 1896, p. 337 (not Lamarck, 1816).

Rupert, 1949, p. 139 (homonym).

Thalophaga Hulst, 1896, p. 339. Rupert, 1949, p. 139, pl. 11, figs. 2, 2a (male genitalia), pl. 12, fig. 4 (venation).

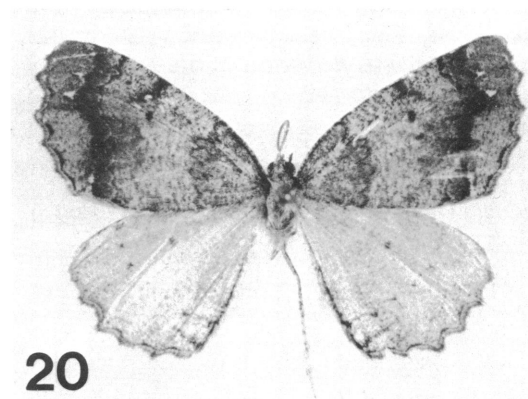
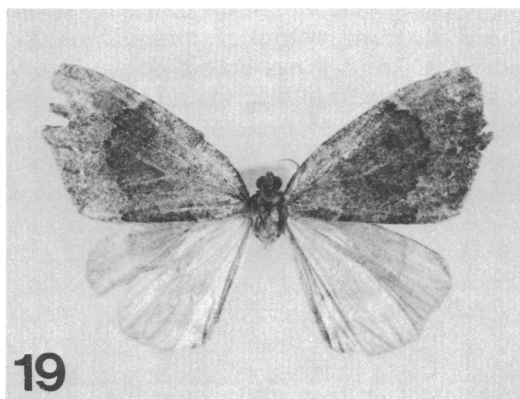
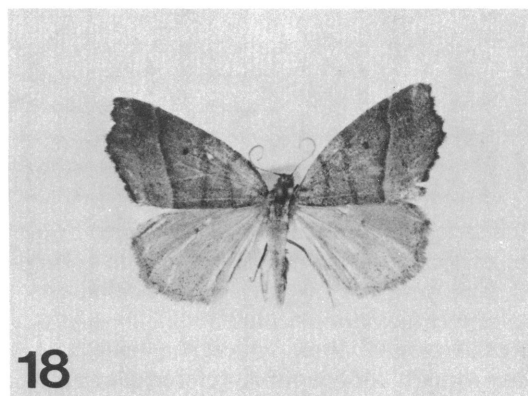
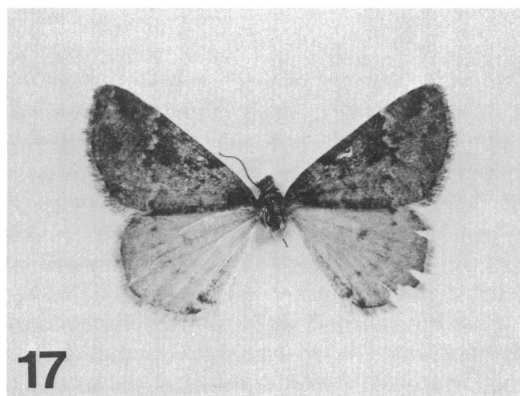
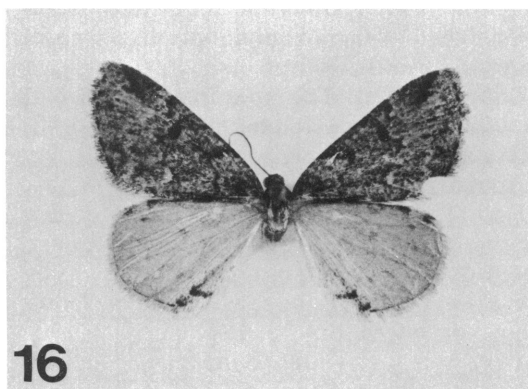
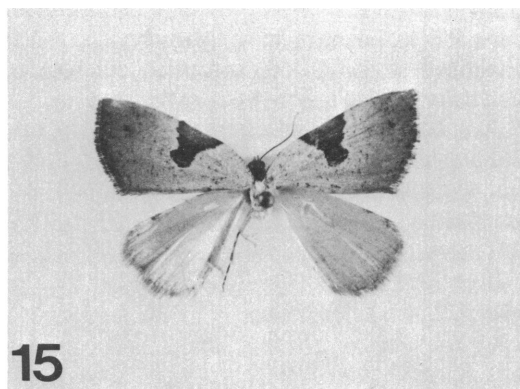
DIAGNOSIS: The adults have long beaklike palpi, with a prominent scale tuft on the ventral portion of the front; the males lack the row of setae on the ventral surface of the third abdominal segment. The upper surface of the forewings is a pale brown or reddish brown, and with the cross lines variably represented, often with the median line the most prominent; the hind wings are paler and relatively unmarked. The male genitalia are without spines in the vesica. The female genitalia have long apophyses, with the posterior ones being

from 1.2 to 1.7 mm long and the anterior ones 0.6 to 0.8 mm in length; the signum is a transverse, indented, smoothly sclerotized structure.

ADULTS: Head with large eyes, each one not as wide as width of front, eyes of females slightly smaller than those of males; front flat or slightly swollen, with prominent ventral tuft; palpi elongate, beaklike, extending in front of eye by at least length of eye, second segment 0.7 mm long, third segment 0.3 to 0.4 mm long; antennae of approximately 53 to 63 segments, simple in both sexes, those of males tending to be prismatic and pubescent below. Thorax very slender; foretibia of males with epiphyses arising at three-fifths length of segment and being two-fifths, or slightly more, its length, of females arising between three-fifths and seven-tenths length and being about one-third to two-fifths length of segment; hind tibia of males with hair pencil. Abdomen very slender, extending to or beyond hind margin of hind wings; males without row of setae on ventral surface of third segment.

Forewings broad, apex pointed, outer margin tending to be weakly concave below apex, outwardly rounded in middle of wing, smooth; with one accessory cell; vein R_1 from R_s , R_2 from near end of cell, R_{3+4} from end of cell, R_5 from bottom of cell; mdc and ldc biconvex. Hind wings broad; Sc paralleling R for half length of cell; m and ldc rounded or angled.

Upper surface of forewings pale brown or reddish brown; t. a. line obsolescent, represented by small venular dots; discal dot obsolescent; median shade line prominent, broad, complete; t. p. line represented by small venular dots, latter either shaded distally by pale yellow or set in slender pale line; terminal line of minute intravenular dark dots; fringe concolorous with wing; hind wings slightly paler than forewings, with partial to complete median shade line and obsolescent extradiscal line; terminal line obsolescent; fringe concolorous with wing. Under surface of all wings pale gray, with variable number of grayish black scales, forewings with basal and median portions suffused with brown or reddish brown; maculation obsolescent, all wings usually with discal dots, and with median and outer lines variably represented.



FIGS. 15–20. Adults from South America. 15. *Nucara recurva*, new species, allotype, female, Fundo Malcho, Chile, November 11–20, 1964 (L. E. Peña). 16. *Lacaria araucanaria* Orfila and Schajovskoy, male, Lago Nonthue, Argentina, October 12, 1952 (S. Schajovskoy) (this specimen is a paratype of *Casbia schajovskoyi* Sperry). 17. *Lacaria orfilai*, new species, holotype, male, Lago Nonthue, Argentina, October 12, 1952 (S. Schajovskoy) (this specimen is also a paratype of *C. schajovskoyi* Sperry). 18. *Franciscoia morenoi* Orfila and Schajovskoy, male, Lake Nonthue, Argentina, 650 m (S. Schajovskoy). 19. *Acauro rotundus*, new species, holotype, male, Aguas Calientes, Chile, December 17–20, 1981 (L. E. Peña). 20. *Calta lamella*, new species, holotype, male, La Picada, Chile, January 13–22, 1980 (L. E. Peña). All AMNH; $\times 1.64$.

Length of Forewings: Males, 15 to 20 mm; females, 15 to 20 mm.

MALE GENITALIA: Uncus elongate, 0.4 to 0.5 mm long, base 0.40 mm wide, moderately broad to slender, sides parallel, apex with single point or rounded ridge; socius elongate, slender, with approximately 10 setae on each side; gnathos more or less V-shaped, about equal in length to length of uncus, apical portion either bluntly tapered or attenuate, having ventral ridge with or without small spinose projections; valves simple, curving posteriorly to about middle of uncus, costa broadly sclerotized; transtilla broad laterally, sharply constricted medially; processes of anellus long and slender, 0.7 to 1.7 mm long, apex with group of densely packed, elongate, slender setae; anellus of two lateral pieces, more or less connected medially; cristae present or absent, when present not prominent, arising from elongate patch, approximately 15 to 20 on each side, about 0.10 to 0.15 mm long; tegumen with single, short median point of fusion; saccus longer than tegumen, broad, with apical margin bluntly wedge-shaped or with shallow median indentation; aedeagus 1.3 to 2.0 mm long, 0.2 to 0.3 mm wide, becoming wider posteriorly, apex with sharp attenuate sclerotized point; vesica unarmed.

FEMALE GENITALIA: Sterigma not differentiated; ostium bursae very large, scarcely differentiated from ductus bursae, widest posteriorly, tapering anteriorly, smoothly sclerotized; ductus bursae either appearing as thickened anterior end of ostium bursae or as enlarged end thereof, quadrangular or elongate; ductus seminalis arising from small sac located ventrally at junction of ductus bursae and corpus bursae, either medially or situated transversely; corpus bursae either long and slender or shorter, with slender posterior end and swollen anterior portion, both types membranous, more or less striate at posterior end, with junction at ductus bursae either mediad or on left side, resulting from corpus bursae being asymmetrical distally, corpus bursae two to three times as long as apophyses posteriores; signum prominent, transverse, indented, V-shaped in cross section, margins smooth to dentate, 0.5 to 0.7 mm in length. Papillae anales small, membranous, with anterior attachment for apophyses;

apophyses posteriores 1.2 to 1.7 mm long, apophyses anteriores 0.6 to 1.0 mm.

EARLY STAGES: Sugden (1968, pp. 28, 29) described the larva of *Thallophega hyperborea* (Hulst), with a brief note on that of *T. taylorata* (Hulst).

FOOD PLANTS: Various conifers (*Tsuga*, *Pseudotsuga*, *Thuja*, *Abies*, *Picea*, and *Pinus*), *Alnus* (Betulaceae), and *Salix* (Salicaceae) (Prentice, 1963, p. 481; Sugden, 1968, pp. 28, 29). *Ribes* (Saxifragaceae) has also been listed (Tietz, 1972, vol. 2, p. 627).

TYPE SPECIES: For *Anthelia* Hulst (not Lamarck), *A. taylorata* Hulst; by original designation. For *Thallophega*, *Tephrosia fautaria* Hulst; by original designation. There is no objective replacement name for Hulst's *Anthelia*; as *taylorata* and *fautaria* are congeneric, *Thallophega* is available as a subjective replacement name.

DISTRIBUTION: Western North America, from southern Alaska, British Columbia, and Idaho to northwestern Baja California North, west of the Cascade and Sierra Nevada ranges.

FLIGHT PERIOD: February into September, with the majority of specimens being caught in the spring.

REMARKS: This genus is in need of a specific revision; three species are usually included.

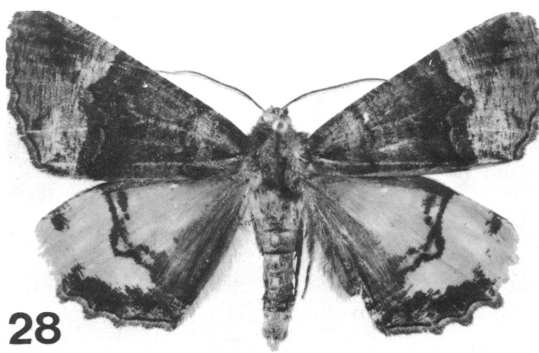
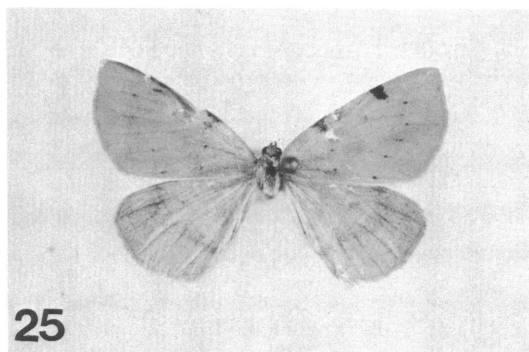
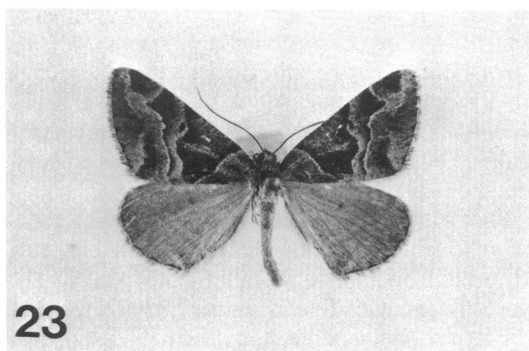
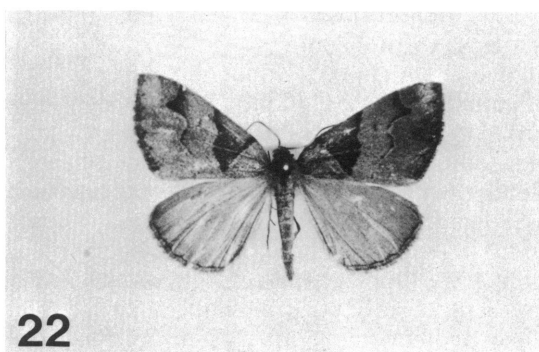
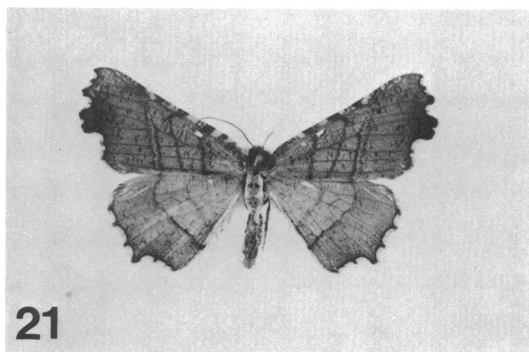
SECTION 2. GENERA FROM CHILE AND ARGENTINA

The early stages and food plants for all the included genera are unknown.

KEY TO GENERA

BASED ON EXTERNAL CHARACTERS

1. Males with pectinate or laminate antennae 2
Males with serrate or simple antennae 3
- 2(1). Males with pectinate antennae; hind wings with upper surface mostly orange or orange-red *Catophoenissa*
Males with laminate antennae; hind wings with upper surface brownish white ..
..... *Caltia*
- 3(1). Palpi shorter than length of eye 4
Palpi as long as, or longer than, length of eye 12
- 4(3). Males with serrate antennae 5
Males with simple, prismatic antennae 6



FIGS. 21–28. Adults from South America. 21. *Huechulafquenina formosa* Orfila and Schajovskoy, female, San Carlos de Bariloche, Argentina, February 1953 (J. Foerster). 22. *Euclidiodes ophiusina*

- 5(4). Basal segment of foretarsus with 2–4 setae *Nucara*
 Basal segment of foretarsus with 5–12 setae *Lacaria*
- 6(4). Front with elongate scaling ventrally ... *Franciscoia*
 Front without elongate scaling ventrally 7
- 7(6). Hind wings with upper surface orange-brown *Incalvertia*
 Hind wings with upper surface white, gray, or brown 8
- 8(7). Foretarsus with basal segment 1.6–1.7 mm long, and with approximately 16 setae *Siopla*
 Foretarsus with basal segment 1.7–2.3 mm long, and with about 2–10 setae ... 9
- 9(8). Palpi with second segment 0.6–0.8 mm long, third segment 0.3–0.4 mm *Odontothera* (in part)
 Palpi with second segment 0.3–0.4 mm long, third segment 0.2–0.3 mm .. 10
- 10(9). Forewings with outer margin round; upper surface of forewings with mixture of greenish and brown scales, often with contrasting pattern 11
 Forewings with outer margin angulate; upper surface of forewings pale grayish brown, with very little contrast in pattern *Acauro*
- 11(10). Vein R_1 connected to R_s ; forewings with outer margin concave between veins .. *Yalpa*
 Vein R_1 not united with R_s ; forewing with outer margin smoothly rounded *Yapoma*
- 12(3). Front with elongate scaling ventrally ... 13
 Front without elongate scaling ventrally 16
- 13(12). Forewings with outer margin evenly rounded 14
 Forewings with outer margin either deeply concave or strongly scalloped below apex, projecting medially 15
- 14(13). With row of setae ventrally on third segment of male abdomen .. *Euclidiodes*
- Without row of setae ventrally on third segment of male abdomen *Guara*
- 15(13). Forewings with outer margin strongly scalloped; hind wings with veins M_3 , Cu_1 and $m + ldc$ combining to form lower angle of cell .. *Huechulafquenina*
 Forewings with outer margin deeply concave below apex, not scalloped; hind wings with veins $m + ldc$ meeting M_3 and with angled vein to Cu_1 *Martindoelloia*
- 16(12). With hair pencil on hind tibia of male .. 17
 Without hair pencil on hind tibia of male *Callemo*
- 17(16). Forewings with upper surface yellow or cream colored 18
 Forewings with upper surface brown or greenish brown 19
- 18(17). Forewings with upper surface yellow, with two brown costal spots; hind wings below with complete brown extradiscal line *Duraglia*
 Forewings with upper surface cream colored, with various longitudinal dark markings; hind wings below without extradiscal line *Psilaspilates*
- 19(17). Palpi extending beyond eye by 1.25 (males) to 1.50 (females) times diameter of eye *Laneco*
 Palpi extending beyond eye by 0.75–1.00 (males) to 1.00–1.25 (females) times diameter of eye *Odontothera* (in part)

BASED ON MALE GENITALIA¹

1. Valves simple, with costa not projecting from valve 3
 Costa extending from edge of valves .. 2
- 2(1). Costa extending as arm from near base of valves, apically spinose *Callemo*
 Costa extending most or all of length of valve, heavily sclerotized, apex diagonal or curved and slightly protruding *Lacaria*

¹ *Huechulafquenina* is not included.

←

(Butler), male, Hornohuino, Chile, December 1968 (L. E. Peña). 23. *Euclidiodes agitata* (Butler), male, Guayacan, Chile, October 1952 (L. E. Peña). 24. *Yapoma chone*, new species, holotype, male, Dalcabue, Chile, January 17–31, 1962 (L. E. Peña). 25. *Duraglia xanthe*, new species, holotype, male, Valdivia, Chile, February 22, 1959 (L. E. Peña). 26. *Laneco suffuscus*, new species, paratype, male, Chacamo, Chile, December 10, 1981 (L. E. Peña). 27. *Incalvertia fumipennis* (Warren), male, El Chinque, Chile, January 20–25, 1980 (L. E. Peña). 28. *Catophoenissa dibapha dibapha* (Felder and Rogenhofer), male, La Picada, Chile, January 13–22, 1980 (L. E. Peña). All AMNH; $\times 1.5$.

- 3(1). Surface of processes of anellus bare .. 4
 Surface of processes of anellus partly or wholly setose 15
- 4(3). Vesica with spines 5
 Vesica without spines 13
- 5(4). Aedeagus 2.0 mm or shorter 6
 Aedeagus longer than 2.0 mm 10
- 6(5). Aedeagus with posterior end narrowed, elongate, sclerotized 7
 Aedeagus with posterior end bluntly pointed or rounded, not lengthily sclerotized 8
- 7(6). Exserted vesica T-shaped, with single elongate (0.5 mm) spine as continuation of vertical portion
 *Martindoelloia*
 Exserted vesica a simple, more or less straight tube, with 10 or more slender spines *Psilaspilates*
- 8(6). Processes of anellus 0.5 mm long, with broadly swollen basal portions .. *Yalpa*
 Processes of anellus 1.0 mm or longer, not swollen ventrally 9
- 9(8). Anellus elongate, extending dorsally from origin, then curving posteriorly; cristae 0.2–0.8 mm long
 *Odontothera* (in part)
 Anellus short, flat; cristae 1.25–1.50 mm long *Franciscoia*
- 10(5). Aedeagus 4.0–5.0 mm long
 *Catophoenissa* (in part)
 Aedeagus 1.4–3.0 mm in length 11
- 11(10). Aedeagus 1.4 mm in length *Nucara*
 Aedeagus 2.0–3.0 mm in length 12
- 12(11). Cristae 6–10 on each side *Yapoma*
 Cristae more than 30 on each side
 *Odontothera* (in part)
- 13(4). Aedeagus 1.4–1.5 mm long *Guara*
 Aedeagus 2.0–2.8 mm in length 14
- 14(13). Processes of anellus 0.6–0.9 mm long ..
 *Catophoenissa* (in part)
 Processes of anellus 2.0 mm in length ..
 *Calta*
- 15(3). Gnathos V-shaped 16
 Gnathos W-shaped, or with median portion like an inverted “U” 17
- 16(15). Aedeagus 1.4 mm long *Siopla*
 Aedeagus 2.5 mm in length *Laneco*
- 17(15). Gnathos W-shaped, with median portion in form of ridge or point 18
 Gnathos with median portion in form of an inverted “U” *Acauro*
- 18(17). Cristae from 50–75 in number, 1.5 mm long *Incalvertia*
 Cristae from about 3–20, and 0.3–0.6 mm long 19
- 19(18). Processes of anellus slender, apically

sharply pointed, weakly setose
 *Euclidiodes*
 Processes of anellus short, broad, apically wedge-shaped, thickly setose, with setae extending beyond processes
 *Duraglia*

YALPA, NEW GENUS

Figures 7, 36, 62

DIAGNOSIS: The members of this genus have palpi that are 1.5 times as long as the diameter of the eyes (males) or are slightly longer (females), and the front is flat and does not have a ventral tuft. The upper surface of the broad, outwardly scalloped forewings has a variably mottled dark brown pattern on a grayish or yellowish green ground color, and has all the cross lines indicated; the hind wings are a contrasting grayish white. The male genitalia have broad processes of the anellus that are 0.5 mm long, and the vesica is armed with a row of about 12 to 15 short curved spines. The female genitalia have a long slender corpus bursae and lack the signum.

ADULTS: Head with large eyes, males with eyes wider than width of front, eyes of females slightly smaller than those of males; front flat, scarcely extending beyond eyes, tightly scaled, without ventral tuft; palpi of males with second segment 0.4 mm long, third segment 0.2 mm long, being about 1.5 times as long as diameter of eyes, of females slightly longer; antennae of approximately 54 to 64 segments, simple in both sexes. Thorax slender; foretibia of males with epiphysis arising at two- to three-fifths length of segment and being from one-half to two-thirds its length, of females arising between two-thirds and three-fourths length and being from one-fourth to one-third length of segment; hind tibia of males with hair pencil. Abdomen slender, extending to or just beyond hind margin of hind wings; males with row of setae on ventral surface of third segment, this structure perhaps partially deciduous.

Forewings broad, costa curved, outer margin rounded, prominently scalloped; with either one or without any accessory cell; vein R_1 to R_s , R_2 either free or from top of cell, R_{3+4} either long stalked or from end of cell (when present), R_5 either from R_{3+4} or from bottom of cell (when present); mdc and ldc angled or rounded. Hind wings broad, outer

margin scalloped; Sc paralleling R for one-half to three-fifths length of cell; m and ldc angled.

Upper surface of forewings mottled dark brown or grayish on yellowish green ground color, variable in pattern and color; t. a. line often indicated by curved broad band, 1 mm wide; median shade line broad, curved or biangulate, usually partly or completely united with dark scaling occupying most or all of area extending to t. p. line; discal spot obscured by median line; t. p. line variably represented, outwardly pointed on veins and strongly concave in cells, often partly obscured by band of dark scaling; subterminal area often pale, contrasting with t. p. line; s. t. line with variable number of small white spots, usually present opposite cell and at outer angle; terminal line more or less complete, slender, black; fringe concolorous with wing or with basal portion darkened, areas opposite vein endings brown. Hind wings whitish, variably marked with scattered brown scales and often with faint pinkish tint distally; discal dot small to obsolescent; extradiscal line of grayish venular dots; terminal line black; fringe concolorous with wing. Under surface of all wings paler than upper surface, with pattern repeated but fainter.

Length of Forewings: Males, 13 to 17 mm; females, 13 to 18 mm.

MALE GENITALIA: Uncus curved, 0.8 to 1.0 mm long, with base 0.4 to 0.5 mm wide, slender, simple, sides parallel, apex pointed; socius elongate, with about 25 setae on each one; gnathos V-shaped, sides with posterior portions curved, of almost equal width for their length, apical portion curved vertically, elongate, minutely spinose; valves simple, straight, costa very slightly widened medially; transtilla with each lateral piece broadened medially, tapered inwardly, with small point of attachment on midline; processes of anellus short, very wide, with posterolateral margin extended as digitate projection, surface bare, about one-half length of uncus, 0.4 to 0.5 mm long, basal portion 0.2 mm wide; anellus long, broad, sclerotized; cristae prominent, arising from semicircular area on each side, approximately 25 on each area, 0.6 to 0.7 mm long, extending to middle of processes of anellus; tegumen with short antero-median fusion; saccus slightly longer than teg-

umen, broad, anterior margin flat or concave; aedeagus 1.9 to 2.0 mm long, 0.25 to 0.30 mm wide, straight, posterior end bluntly pointed, weakly sclerotized; vesica with elongate row of about 12 to 15 curved, diagonally arranged, short (longest ones 0.2 mm) spines, row extending two-fifths length of aedeagus.

FEMALE GENITALIA: Sterigma with sclerotized lamella antevaginalis, wider than long, subtriangular or subrectangular in outline, posterior margin weakly concave medially, lamella postvaginalis membranous, not defined, median area with a few short transverse striations; ductus bursae short, wide, vertical, 1.5 to 3.0 times wider than than high, sclerotized; ductus seminalis arising from ventral sac at posterior end of corpus bursae; corpus bursae very long and slender, of approximately equal width for entire length, 5.5 to 6.5 mm long, membranous except for small slightly sclerotized area on left side posteriorly, posterior end longitudinally striate, corpus bursae 5.5 to 6.0 times as long as apophyses posteriores; signum absent. Papillae anales long, slender, pointed, with anterior attachment for apophyses; length of apophyses posteriores 0.9 to 1.0 mm, apophyses anteriores 0.4 mm.

TYPE SPECIES: *Yalpa dalcachue*, new species.

DISTRIBUTION: Central and southern Chile, plus adjacent Argentina.

FLIGHT PERIOD: December, January, February, and March.

REMARKS: Two species have been placed in this genus.

Yalpa shares the apomorphic characters of more than 50 cristae and absence of a signum with *Odontothera* (in part) and *Laneco*. The present genus is distinguished from *Odontothera* by having shorter palpi (0.6 mm, compared with 0.9–1.2 mm), a longer uncus (0.8–1.0 mm, compared with 0.5–0.7), a spined apex of the gnathos, the broad processes of the anellus, a flat anellus, a straight aedeagus, a ductus bursae shorter than wide, and the shorter apophyses posteriores (0.9–1.0 mm, compared with 1.5–1.9 mm). It is distinguished from *Laneco* by palpi shorter than length of eye, bare surface of processes of the anellus, aedeagus shorter than 2.0 mm, and the absence of striations on the posterior portion of the corpus bursae.

ETYMOLOGY: The generic name is an ar-

bitrary combination of letters; the gender is feminine.

Yalpa dalcachue, new species

Figures 7, 36, 62

DIAGNOSIS: As given for the genus.

ADULTS: Head with vertex pale brown; front concolorous with vertex or with more white scaling; palpi dark gray and grayish black laterally, whitish on inner surface and apically. Thorax with mixture of pale brown, darker brown, and pale gray scaling, patagia grayish; below pale gray; legs cream colored, variably spotted with black. Abdomen pale gray and cream, sparsely spotted with black.

Upper Surface of Wings: Forewings mottled dark brown on yellowish green ground color; t. a. line broad, dark brown, biconvex; median area with basal portion yellowish green, distally dark brown or blackish brown, with discal spot at edge of darkened area; t. p. line varying from clearly represented to being included in dark median shading, outwardly pointed on veins, strongly concave in cells; subterminal area partially suffused with dark scaling, with s. t. line having variable number of white spots; females tending to be less solidly darkened than males, with more dappled appearance. Hind wings white or whitish, with variable number of scattered brownish black scales; discal dot and partial double extradiscal line present, latter consisting of two rows of venular dots. Under surface of wings with forewings having mixture of pale gray, grayish brown, and brown scales, with maculation of upper surface weakly repeated; hind wings similar to upper surface, with stronger maculation.

Length of Forewings: Holotype and allotype, 15 mm; male paratypes, 13 to 15 mm, female paratypes, 14 to 16 mm.

MALE GENITALIA: Uncus 0.80 to 0.85 mm long, with base 0.4 mm wide; cristae 0.6 mm in length; aedeagus 1.9 to 2.0 mm long, 0.25 to 0.30 mm wide; vesica with approximately 15 curved spines.

FEMALE GENITALIA: Sterigma with subrectangular lamella antevaginalis; ductus bursae three times wider than long; corpus bursae approximately 5.5 mm long. Apophyses posteriores 0.9 mm long, apophyses anteriores 0.4 mm.

TYPES: Holotype, male, Dalcachue, Chiloé, Chile, February 12, 1973 (L. E. Peña); allotype, female, same data, February 1971. The genitalia of the holotype are mounted on slide FHR 19,140A, with one antenna and set of legs on FHR 19,140B; the genitalia of the allotype are on slide FHR 19,213A, with part of one antenna and set of legs on FHR 19,213B. Paratypes, all from Chiloé, Chile: Dalcachue, E coast Chiloé Island, February 10–12, 1957 (L. E. Peña), one male; Río Carihueico, mountains of Chiloé Island, NW of Castro, February 18–25, 1957 (L. E. Peña), one male; Dalcachue, E coast of Chiloé Island, February 1961 (L. E. Peña), one male, January 17–31, 1962 (L. E. Peña), 98 males; Dalcachue, February 1971 (G. Barria), 63 males, 2 females, February 12, 1973 (G. Barria), 43 males; Huequetrúmao, 22 km N Quellon, December 26–28, 1981 (L. E. Peña), seven males.

The holotype, allotype, and paratypes are in the collection of the AMNH.

DISTRIBUTION: Known only from the type series from Chiloé, Chile.

FLIGHT PERIOD: December, January, and February.

REMARKS: Two hundred eighteen specimens (215 males, 3 females), genitalic slides of two males and one female, and slide mounts of antennae and legs of one male and one female have been studied.

The sister species of *dalcachue* occurs in Chile (the provinces of Arauco, Cautin, Linares, Malleco, Nuble, Osorno, Santiago, and Valdivia) and adjacent Argentina (Neuquen). There is less individual variation in the color and pattern of *dalcachue* than in its congener; the latter ranges from being basically similar to *dalcachue* to having the upper surface of the forewings mostly dark brown. In addition, *dalcachue* is distinguished by its slightly smaller size, the longer epiphysis on the male foreleg, a shorter uncus, shorter cristae, the aedeagus with a blunter posterior end, more spines in the vesica, the shorter apophyses posteriores, and the broader and narrower ductus bursae.

All the specimens that I have studied were received dry and had to be mounted; it is not known whether the process of relaxing them, with its high humidity, has affected the color of the forewings.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

GENUS *ODONTOTHERA* BUTLER

Figures 8, 9, 37, 38, 63

Odontothera Butler, 1882, p. 409.

Proteopharmacis Warren, 1895, p. 153. Orfila and Schajovskoy, "1959" [1960], p. 17, figs. 7-9 (venation, male and female genitalia), pl. 1, fig. 5 (adult). New synonymy.

DIAGNOSIS: The members of this genus have palpi that are slightly shorter than or equal to the diameter of the eyes, and the front is flat and does not have a ventral tuft. The upper surface of the broad, triangular wings has the outer margin angled and scalloped, the forewings are various shades of brown, greenish brown, or gray, and the median area is either concolorous with the remainder of the wing or is a contrasting yellow, and there is often considerable variation within a species; the hind wings are concolorous with, or slightly paler than, the forewings. The male genitalia have long and slender processes of the anellus, the vertical, long, straplike anellus is an autapomorphic character, and the aedeagus is C-shaped. The female genitalia have an autapomorphic flattened, ribbonlike, curved ductus bursae that is three to four times as long as wide, and the elongate, posteriorly sclerotized corpus bursae does not have a signum.

ADULTS: Head with large eyes, males with eyes as wide as or wider than width of front, eyes of females slightly smaller than those of males; front flat or weakly swollen, scarcely extending beyond eyes, tightly scaled, without ventral tuft; palpi of males with second segment 0.6 to 0.8 mm long, third segment 0.3 to 0.4 mm, being from three-fourths to equal to diameter of eye in length, of females slightly longer, being from equal to 1.25 times diameter of eye; antennae of approximately 54 to 68 segments, simple in both sexes, shortly and densely ciliate on under surface. Thorax slender; foretibia of males with epiphysis arising between three-fifths and two-thirds length of segment and being about two-fifths its length, of females arising between two-thirds and three-fourths length and being between one-third and two-fifths length of segment; hind tibia of males with hair pencil.

Abdomen slender, extending to hind margin of hind wings; males with deciduous row of reduced setae on ventral surface of third segment.

Forewings broad, triangular, outer margin angulate, shallowly scalloped; either one or no accessory cell; vein R_1 either free or to R_s , R_2 either free or from top or end of cell (when present), R_{3+4} either stalked or from end of cell (when present), R_5 either from R_{3+4} or from bottom of cell (when present); mdc and ldc rounded or biconvex. Hind wings broad, weakly angulate, outer margin scalloped; Sc paralleling R for two-fifths to one-half length of cell; m and ldc rounded or angled.

Upper surface of forewings various shades of brown, greenish brown, or gray, unicolorous or with yellowish or dark brown median area; t. a. line angulate from costa, then more or less straight across wing to inner margin; median area broad, some specimens with median shade line; discal spot small or obsolescent; t. p. line weakly S-shaped or almost straight, prominent or represented by small venular dots; subterminal area concolorous with basal area; s. t. line absent or represented by small spots in lower part of wing; terminal line obsolescent or in form of small intravenular dark spots; fringe concolorous with wing. Hind wings either concolorous with, or slightly paler than, forewings; discal dot and median shade line small to obsolescent; extradiscal line almost straight, similar in form and color to t. p. line; terminal line and fringe as on forewings. Under surface brown or grayish brown, hind wings either concolorous with, or paler than, forewings; pattern repeated from upper surface but fainter.

Length of Forewings: Males, 13 to 18 mm; females, 15 to 18 mm.

MALE GENITALIA: Uncus curved, 0.5 to 0.7 mm long, with base 0.4 to 0.5 mm wide, slender, simple, slightly tapered to pointed apex; socius small, subtriangular to elongate, with from about 30 to 50 setae on each one; gnathos V-shaped, elongate, sides curved, tapering in width ventrally, apical portion rounded or pointed, curved ventrally, smoothly sclerotized or punctate; valves simple, curved posteriorly, elongate, extending to about middle of uncus; transtilla large, each side subtriangular, extending posteriorly, posterior margin curved, shortly united me-

dially; processes of anellus very long and slender, arising dorsally from lateral margins of anellus, curved, surface bare, each apex pointed, usually longer than uncus, 1.0 to 1.6 mm long, rarely short, 0.4 mm in length; anellus elongate, vertical, two to three times longer than wide, subrectangular; cristae present or absent, when present arising from elongate area, varying from about five on each side and 0.2 mm long, to 20 or 30 and 0.6 to 0.8 mm long; tegumen with anteromedian fusion about one-half length of adjacent tegumen; saccus about twice as long as tegumen, anterior margin broadly rounded; aedeagus C-shaped, 1.7 to 3.3 mm long (measured in straight line from one end to other), 0.1 to 0.2 mm wide, posterior end rounded or bluntly pointed, posterolateral regions very narrowly sclerotized or with faint longitudinal striations; vesica with either an elongate row of about 16 to 25 diagonally arranged setae, 0.3 to 0.7 mm in length, extending most of length of aedeagus, or with from 3 to 10 setae medially, 0.15 to 0.60 mm long.

FEMALE GENITALIA: Sterigma without lamella antevaginalis, lamella postvaginalis appearing as sclerotized ventral surface of segment, square or slightly longer than wide, with transverse striations, and with one or two slight vertical ridges or striations laterally; ductus bursae sclerotized, very flat, undulating, elongate, three to four times as long as wide, posterior end flared out, anteriorly joined to dorsal portion of corpus bursae; ductus seminalis arising from sac at posterior end of corpus bursae, ventrad of ductus bursae; corpus bursae elongate, two to three times longer than apophyses posteriores, curved medially, posterior portion heavily and smoothly sclerotized, anterior portion slightly swollen, becoming membranous, slightly asymmetrical, with longitudinal striations for most of length, anterior end without striations; signum absent. Papillae anales weakly sclerotized, poorly defined, long, slender, pointed, with anterior point of attachment for apophyses; apophyses posteriores 1.5 to 1.9 mm long, apophyses anteriores 0.9 to 1.1 mm in length.

TYPE SPECIES: *Odontothera virescens* Butler for *Odontothera*; designated by Fletcher, 1979, p. 144. *Scotopteryx valdiviana* Felder

and Rogenhofer for *Proteopharmacis*; by original designation.

DISTRIBUTION: Central and southern Chile, and adjacent Argentina.

FLIGHT PERIOD: November into March.

REMARKS: Five species are included in this genus. Three of these, including *valdiviana*, have the upper surface of the wings various shades of brown; there is a considerable range of variation within each species as to color, or combinations of colors, and a study of the genitalia may be required to properly segregate the taxa. A fourth species, *virescens*, has the upper surface a finely mottled or speckled greenish, with the hind wings being almost concolorous with the forewings; this latter character will separate *virescens* from *Yalpa dalcachue*. The fifth species is basically similar in maculation to the fourth one but the upper surface is a pale gray.

My identification of *Odontothera virescens* Butler is based on material from the Sperry collection (now in the AMNH) that was determined by Fletcher at the BM; of *valdiviana*, by a comparison with the figure given as the original description, and matching it with specimens in my care. The type species of the two genera do not appear to be closely allied when just the color and maculation are compared. However, a study of the genitalia, plus numerous other characters, proves that they are congeneric in my opinion, as they differ primarily in color and pattern of the upper surface of the wings, and in *virescens* lack cristae, which are present in the other four included species. As a result of my analysis, *Proteopharmacis* is placed as a synonym of *Odontothera*.

The two autapomorphic genitalic characters given in the Diagnosis will distinguish both males and females from any other known Lithinini genus.

GENUS *PSILASPILATES* BUTLER

Figures 10, 39, 64

Psilaspilates Butler, 1893, p. 458.

Psilaspilates Warren, 1894, p. 438 (junior homonym of *Psilaspilates* Butler, 1893).

DIAGNOSIS: The members of this genus may be recognized by the length of the palpi, which is 1.0 to 1.5 times the diameter of the eye.

The upper surface of the wings is creamy or yellowish ochre, with most species lacking cross lines; the forewings are without an accessory cell. The male genitalia have curved processes of the anellus that are 0.30 to 0.75 mm long, the everted vesica has a median sac and from about 10 to 40 slender setae. The female genitalia have an elongate corpus bursae, often with the posterior end striated, and a small signum.

ADULTS: Head with each eye of males slightly narrower than or same width as front, of females slightly smaller; front flat, scarcely extending beyond eyes, tightly scaled, without ventral tuft; palpi long, males with second segment 0.7 to 0.8 mm, third segment 0.4 to 0.6 mm in length, extending beyond front of eye for distance 1.0 to 1.5 times diameter of eye, of females slightly longer, extending from 1.25 to just over 1.5 times diameter of eye; antennae of approximately 49 to 58 segments, simple in both sexes. Thorax slender; foretibia of males with epiphysis arising between one-third and one-half length of segment and being one-half to two-thirds its length, of females arising between one-third and two-fifths length and being three-fifths to two-thirds length of segment; hind tibia of males with hair pencil. Abdomen slender, extending shortly beyond hind wings in males, of about same length as wings in females.

Forewings broad, apex weakly attenuate, outer margin concave below apex, swollen medially, smooth; without accessory cell; vein R_1 free or to R_s , R_2 free, R_{3+4} stalked, R_5 from R_{3+4} ; mdc and ldc rounded or biconvex. Hind wings somewhat triangular, with slight concave area below apex; Sc paralleling R for about three-fifths length of cell; m and ldc rounded.

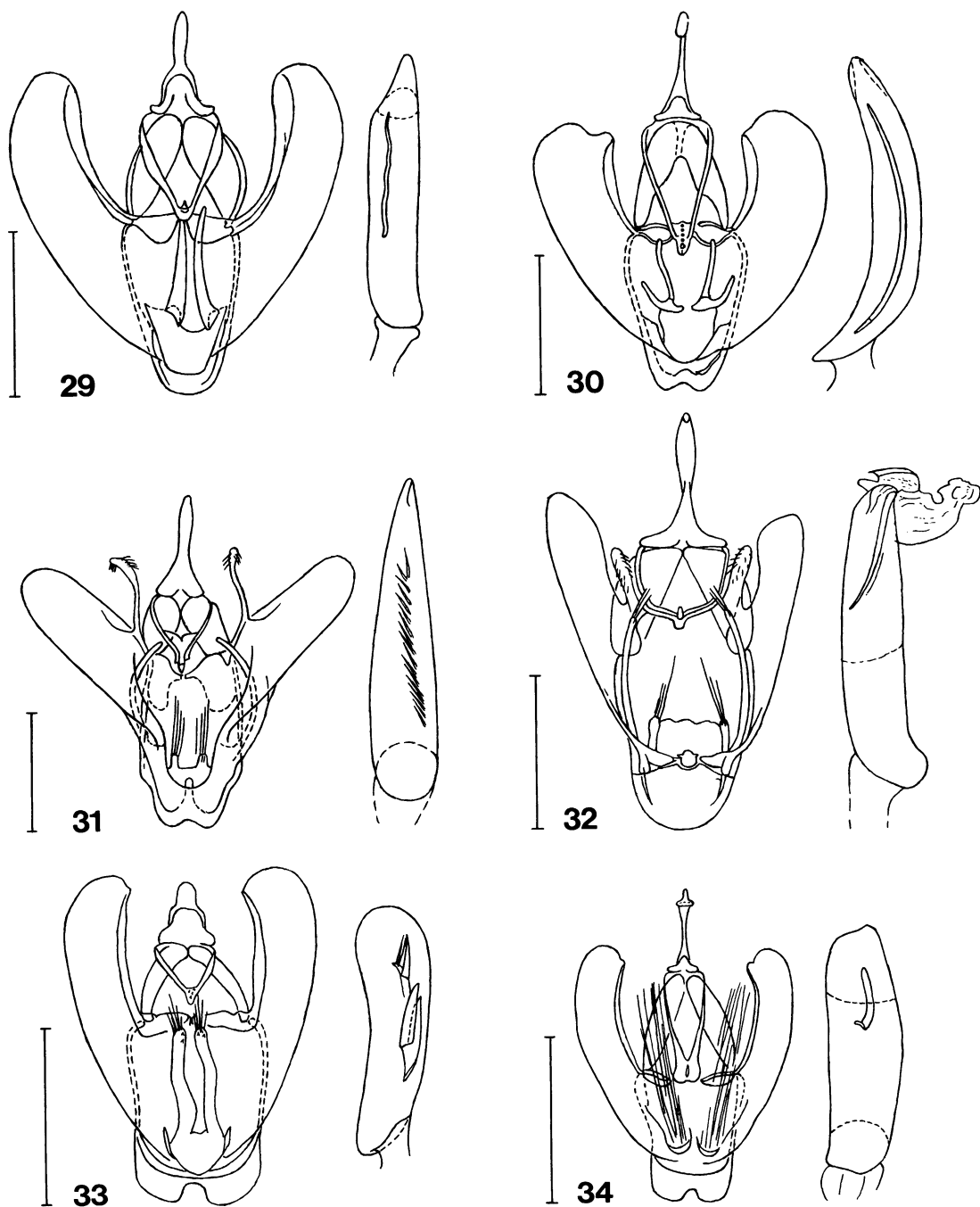
Upper surface of forewings creamy or yellowish ochre, with or without brown scaling; cross lines absent in most species, with variable dark scaling along veins instead; when cross lines present, t. a. line outwardly oblique, basal portion of median area darkened, indicating curved median shade line at outer margin, and with t. p. line arising at right angle to costa, with lower portion broadly and evenly concave; black discal spot and small terminal dots present in all species; fringe concolorous with wing. Hind wings very

slightly paler than forewings; without maculation except for obsolescent discal dot. Under surface of forewings suffused with brownish scales, hind wings paler; maculation varying from obsolescent to having discal dots and partial or complete row of small venular dots indicating t. p. and extradiscal lines.

Length of Forewings: Males, 13 to 18 mm; females, 12 to 19 mm.

MALE GENITALIA: Uncus curved, 0.8 to 1.0 mm long, with base 0.4 to 0.6 mm wide, slender to moderately broad, slightly constricted medially, apex with single elongate point; socius shortly digitate, with from about 8 to 25 setae on each one; gnathos either an elongate V or W-shaped, sides straight, apical portion of V slightly curved ventrally, not enlarged but with posteroventral ridge having minute spines or denticulations, of W-shaped species broad, with recurved, densely spinose median area; valves simple, broad; transtilla with each lateral piece variously swollen but with anteromedian projection, curving medioposteriorly and with small point of attachment on midline; processes of anellus relatively thick, more or less tapering distally, apically pointed, surface bare, 0.30 to 0.75 mm long; anellus broad, sclerotized, of various shapes; cristae very slender, from linear area, from about 6 to 12 on each side, 0.3 to 0.4 mm long; tegumen broad, with dorso-median area X-shaped; saccus slightly longer than tegumen, tapering, anterior margin with median invagination; aedeagus 1.5 to 2.0 mm long, 0.25 to 0.30 mm wide, weakly curved, posterior end an elongate laterally sclerotized point; vesica with from about 10 to 40 long, slender spines, the longest being 0.3 to 0.9 mm in length, occupying from one-fifth to three-fifths length of aedeagus; vesica, when exerted, in form of simple sac, with small median swelling, extending at angle to aedeagus, and with spines directed laterally and anteriorly.

FEMALE GENITALIA: Sterigma with lightly sclerotized lamella antevaginalis, anterior margin rounded or concave medially, posterior margin straight, lamella postvaginalis membranous, median area with transverse striations; ductus bursae with lateral areas appearing more heavily sclerotized than center, square or slightly longer than wide, pos-



FIGS. 29-34. Male genitalia. 29. *Philedia punctomacularia* (Hulst), Wellington, British Columbia, October 7, 1950 (R. Guppy). 30. *Petrophora divisata* Hübner, Ocean Co., New Jersey, May 14, 1944 (O. Buchholz). 31. *Tacparia zalissaria* Walker, Port Sewall, Florida, February 19, 1938 (L. C. Sanford). 32. *Tacparia atropunctata* (Packard), Enfield, Maine, June 27, 1969 (L. P. Grey). 33. *Gueneria basiaria* (Walker), Black Mountains, North Carolina, June 10. 34. *Homochlodes lactispargaria* (Walker), Bar Harbor, Maine, May 11, 1937 (A. E. Brower). All AMNH; bar equals 1 mm.

terior end flared or straight sided; ductus seminalis arising from either swelling or sac at posterior end of corpus bursae; corpus bursae elongate or rather wide and shorter, 2.5 to 4.0 times longer than apophyses posteriores, posterior portion either sclerotized, with definite longitudinal striations, and with anterior portion somewhat swollen, or membranous, with faint longitudinal striations, and with anterior portion scarcely enlarged; signum small to minute, round or elliptical on surface of corpus, flat and with rayed margin or with indented rim having few and small dentitions. Papillae anales short, rounded, with anterior or median attachment for apophyses; apophyses posteriores 0.8 to 1.2 mm long, apophyses anteriores 0.3 to 0.6 mm.

TYPE SPECIES: *Panagra cavifasciata* Butler, for *Psilaspilates* Butler; designated by Fletcher, 1979, p. 177. *Lozogramma butyroza* Butler, for *Psilaspilates* Warren; by original designation. *Psilaspilates* was used and made nomenclaturally available by Butler prior to its proposal and generic description by Warren. There is no objective replacement name for the junior homonym; as both *cavifasciata* and *butyroza* are congeneric, in the opinion of Fletcher (op. cit.), none is needed.

DISTRIBUTION: Chile and adjacent Argentina.

FLIGHT PERIOD: From October into May.

REMARKS: I have studied six species that are being placed in this genus. They may be distinguished by the apomorphic characters listed in the tables, by the keys, and by the Diagnosis.

CALLEMO, NEW GENUS

Figures 11, 40, 65

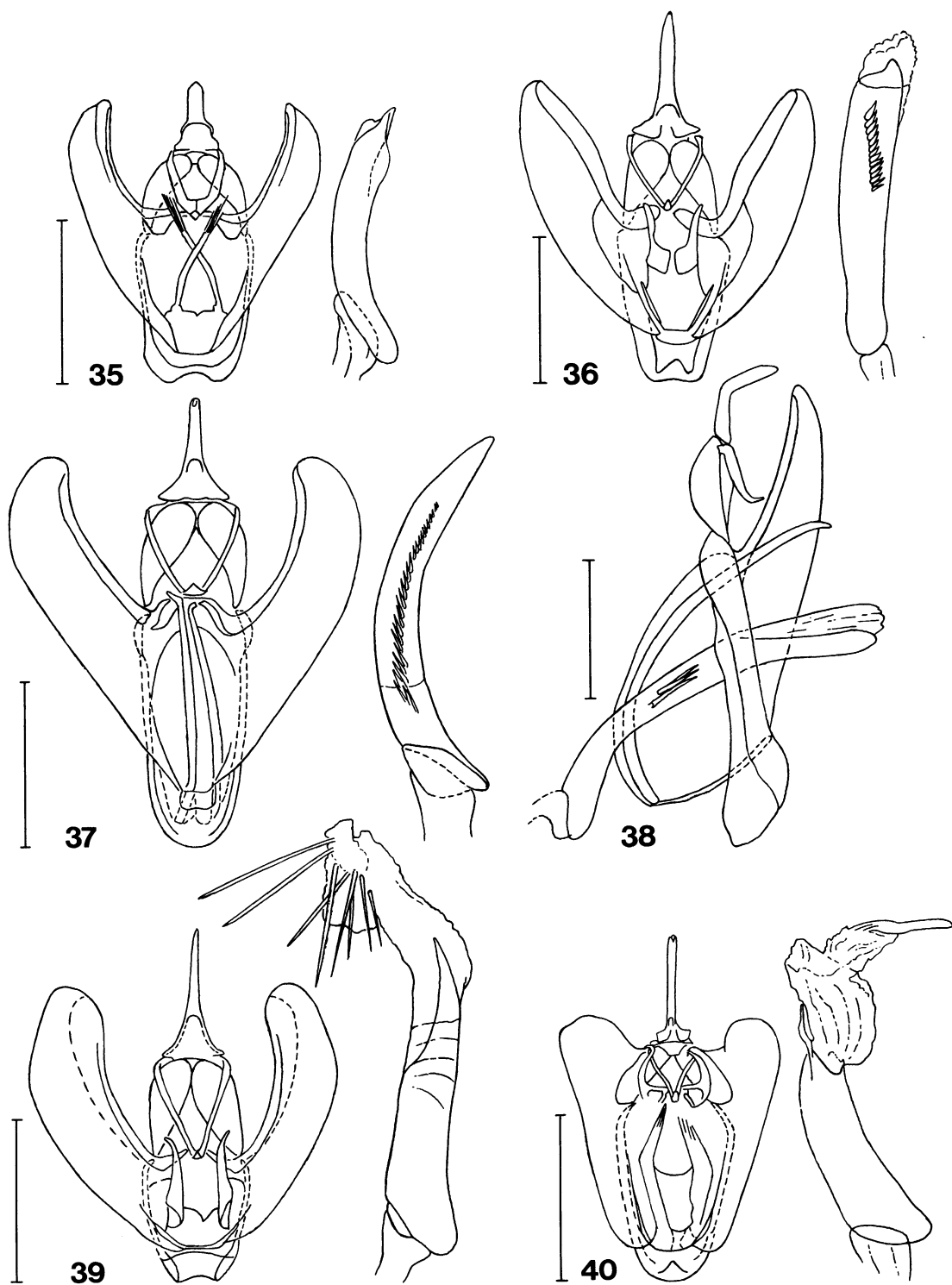
DIAGNOSIS: The moths of this genus may be recognized by the elongate palpi which extend beyond the eyes 1.25 (males) to 1.50 (females) times the diameter of the eye, by the small ventral tuft on the front, and by the absence of the hair pencil on the hind tibia of the males. The upper surface of all wings is a uniform dark brown, with obscure maculation. The male genitalia have the uncus curved in a C-shape, the valves have a strongly sclerotized costal arm, the processes of the anellus are angled, and the vesica has a single large spine. The female genitalia have a large

corpus bursae with the posterior third lightly sclerotized and longitudinally striate, the anterior two-thirds membranous, and the signum an elongate, sclerotized, semicircular strip.

ADULTS: Head with eyes of males slightly narrower than width of front, eyes of females smaller than those of males; front weakly swollen, barely extending beyond eyes, tightly scaled, with small ventral tuft; palpi of males with second segment 0.7 mm long, third segment 0.4 mm, extending about 1.25 times diameter of eye in front of eye in males, 1.50 times in females; antennae of about 46 or 47 segments, simple in both sexes. Thorax slender; foretibia of males with epiphysis arising at two-fifths length of segment and being three-fifths its length, of females shorter; hind tibia of males without hair pencil. Abdomen slender, extending to hind margin of hind wings in both sexes; males without row of setae on ventral surface of third segment.

Forewings broad, apex acute, outer margin weakly angulate, smooth; either with or without one accessory cell; vein R_1 free, R_2 either free or from end of cell (when present), R_{3+4} either stalked or from end of cell (when present), R_5 either stalked with R_{3+4} or from near end of cell (when present); mdc and ldc weakly biconcave. Hind wings broad, round, outer margin smooth except for faint dual concavity below apex; Sc paralleling R for half length of cell; m and ldc weakly angled.

Upper surface of forewings dark brown, with median area tending to be very slightly paler; t. a. line not prominent, extending at right angle from costa to cell, then outwardly biconvex, curving basally to inner margin; discal dot small, either basad of or on edge of gently curving median shade line; t. p. line formed by series of dark venular dots paralleling outer margin, each dot shaded distally by white scales; subterminal area not differentiated and s. t. line obsolescent; terminal line absent; fringe concolorous with wing except for narrow grayish white outer margin. Hind wings concolorous with forewings, having faint median shade line and extradiscal line; terminal line absent; fringe similar to that of forewing. Under surface dark grayish brown, forewings paler along inner margin, hind wings slightly paler than



FIGS. 35-40. Male genitalia. 35. *Thallophaga hyperborea* (Hulst), Seattle, Washington, emerged January 30, 1944 (A. Herz). 36. *Yalpa dalcahue*, new species, holotype, Dalcahue, Chile, February 12, 1973

forewings; veins of all wings faintly orange-brown; forewings with faint discal dot and t. p. line of dark venular dots, with s. t. line gray, angulate in cells; hind wings with pattern of upper surface repeated, more strongly represented; terminal lines weakly present on all wings; fringes concolorous with wings, without distal grayish white edging.

Length of Forewings: Males, 12 to 14 mm; females, 15 to 16 mm.

MALE GENITALIA: Uncus sharply curved for more than 90°, with base 0.25 mm wide, slender, sides parallel, digital portion with slender setae on outer surface, apex bluntly pointed; socius short, with about 10 setae on each one; gnathos with sides of posterior portion slanting inwardly, then converging to form elongate V-shaped median projection, apex terminating in prominent recurved point; valves broadly attached to saccus, with only widened distal portion of valvula spreading out laterally, with heavily sclerotized costa curving medially, apical portion troughlike and with short, slender spines at each apex, valvula widened distally, not quite attaining apex of costa; transtilla large, rounded laterally, narrowed posteromedially and having small point of attachment at midline; processes of anellus extending to transtilla, angled medially, posterior portion tapered to point and having several slender setae, total length 0.5 mm; anellus quadrate, longer than wide, membranous except for strips basad of processes; cristae very slender, extending posteriorly to ends of processes of anellus, 0.7 mm long, about nine setae on each side arising from linear area; tegumen triangular, almost twice as wide as long, with slender transverse bar forming median fusion; saccus three times longer than tegumen, tapering, anterior margin rounded or bluntly pointed; aedeagus 1.3 to 1.5 mm long, 0.2 to 0.3 mm wide, weakly curved, posterior end sclerotized, somewhat angled, forming elongate slender point; vesica armed with single, large,

heavily sclerotized cornutus, 0.5 mm long, basal portion widened, when exerted, extending at angle to aedeagus.

FEMALE GENITALIA: Sterigma with large, membranous funnel-shaped ostium bursae, without defined lamellae; ductus bursae small, square, weakly sclerotized; ductus seminalis arising from ventral sac at posterior end of corpus bursae; corpus bursae ovate, three times as long as apophyses posteriores, posterior three-tenths lightly sclerotized and with numerous longitudinal striations, anterior portion membranous; signum in form of slender, semicircular V-shaped band on left side anterior of membranous area, apices pointed. Papillae anales elongate, posteriorly rounded, with anterior point of attachment for apophyses; apophyses posteriores 1.5 mm long, anterior apophyses 1.0 mm.

TYPE SPECIES: *Callemo monotonos*, new species.

DISTRIBUTION: Central and southern Chile, and adjacent Argentina.

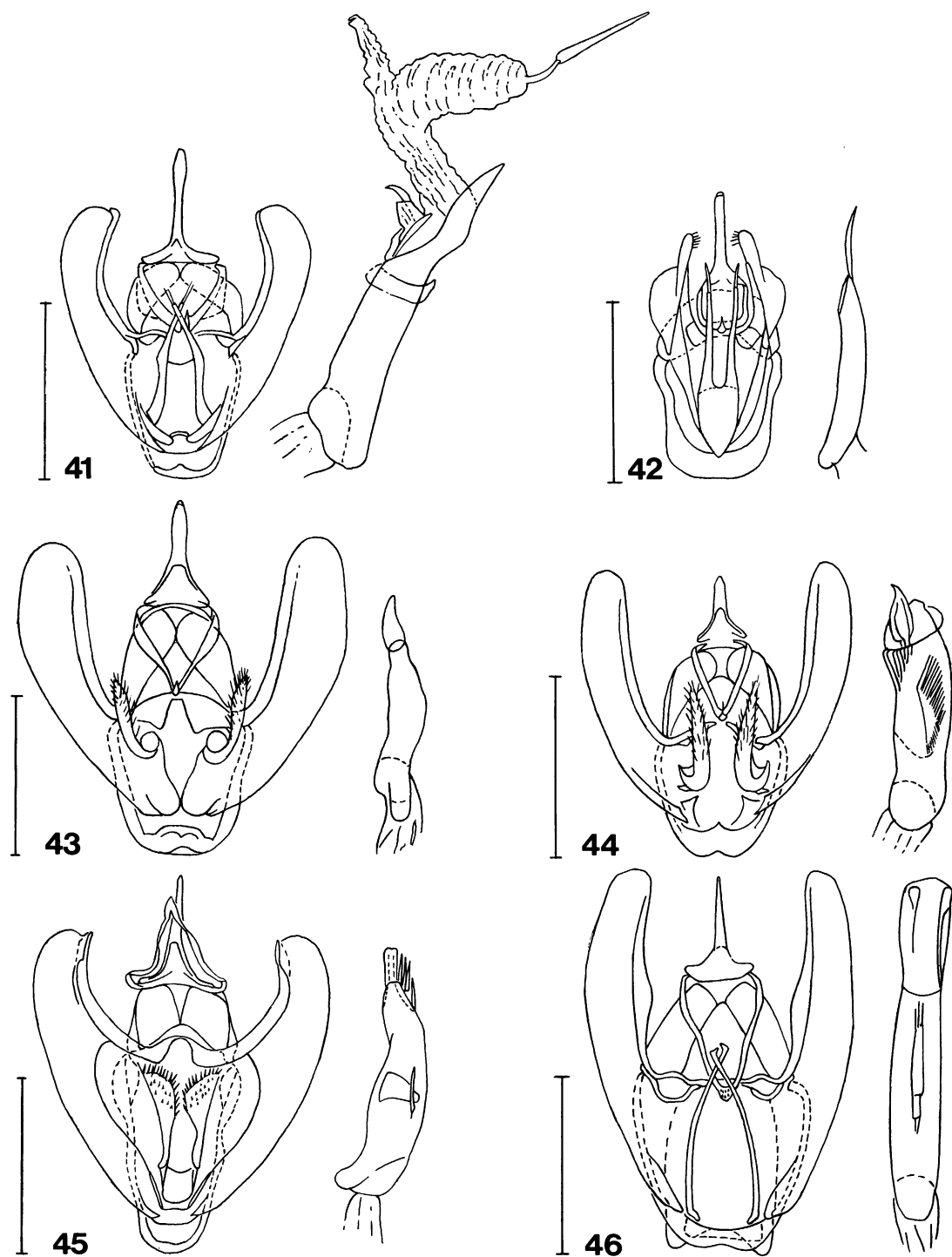
FLIGHT PERIOD: November, December, January, and February.

REMARKS: Only the type species is placed in this genus.

Callemo is the only genus to possess the apomorphic characters in the male genitalia of having valves with costal arms, plus cristae. In the female genitalia, it shares with *Martindoelloia* a ductus bursae that is as long as wide, a corpus bursae that is three times as long as the apophyses posteriores, striations posteriorly on the corpus bursae, and having the signum in the form of an elongate, slender, V-shaped band. The female structures of *Callemo* can be distinguished from those of *Martindoelloia* by the former having a shorter and more clearly defined posteriorly striate portion of the corpus bursae, with a definite line of demarcation between it and the anterior membranous part, and by the much larger signum being immediately adjacent to this line of separation.

←

(L. E. Peña). 37. *Odontothera valdiviata* (Felder and Rogenhofer), Las Viscaches, Chile, December 1–12, 1982 (L. E. Peña). 38. *Odontothera virescens* Butler, Aguas Calientes, Chile, January 2–6, 1982 (L. E. Peña) (lateral view). 39. *Psilaspilates signistriaria* Butler, W. Catapilco, Chile, March 12–13, 1964 (L. E. Peña). 40. *Callemo monotonos*, new species, holotype, Estero La Juala, Chile, January 4–18, 1964 (L. E. Peña). All AMNH; bar equals 1 mm.



FIGS. 41-46. Male genitalia. 41. *Martindoelloia juradoi* Orfila and Schajovskoy, Hornohuinco, Chile, December 1968 (L. E. Peña). 42. *Guara rhapsis*, new species, holotype, El Chinque, Chile, January 22, 1980 (L. E. Peña). 43. *Siopla derance*, new species, holotype, Las Trancas, Chile, December 1-15, 1976

ETYMOLOGY: The generic name is an arbitrary combination of letters; the gender is masculine.

***Callemo monotonos*, new species**

Figures 11, 40, 65

DIAGNOSIS: As given for the genus.

ADULTS: As described for the genus.

Length of Forewings: Holotype, 14 mm; allotype, 16 mm; male paratypes, 12 to 14 mm, female paratypes, 16 to 17 mm.

MALE GENITALIA: As described for the genus.

FEMALE GENITALIA: As described for the genus.

TYPES: Holotype, male, Estero La Juala, Andes, Los Quenes, Curico, Chile, January 4–18, 1964 (L. E. Peña); allotype, female, Contulmo, Palo Botado, [Arauco], Chile, February 1, 1953 (L. E. Peña). The genitalia of the holotype are mounted on slide FHR 14,569, and those of the allotype on FHR 14,498. Paratypes, all from Chile and collected by L. E. Peña: Las Trancas, 1100 m, NE of Recinto in Chillan area, Nuble, January 24–30, 1983, February 15, 1983, four males, one female; Río Blanco, Andes, Curacautin, Malleco, February 1964, two males; Pucatrihue, coastal Osorno, January 24–31, 1966, one male; Rincón de Piedra, Santo Domingo, Valdivia, February 23–26, 1979, two males; Lago Toro, 700 m, near Puyehue, Osorno, February 7–8, 1978, one male; "Aguas Calientes," 600 m, Puyehue National Park, Osorno, February 10–22, 1979, four males, three females; Hornohuincó, S of Chapo Lake and E of Puerto Montt, Llanquihue, December 1968, one male; La Picada, 600 m, N of Petrohue, Llanquihue, January 13–22, 1980, one male; El Chinque, 300 m, N of Correntoso, Llanquihue, January 20–25, 1980, seven males, two females; Dalcabue, NE of Castro, Chiloé, February 1, 1981, one male. The allotype is from the Sperry collec-

tion; the label does not include the province, but I have added it in brackets, above.

The holotype, allotype, and paratypes are in the collection of the AMNH.

DISTRIBUTION: Central and southern Chile, plus Neuquen, Argentina (the 8 males from the latter country are excluded from the type series).

FLIGHT PERIOD: From November into February.

REMARKS: Forty specimens (35 males, 5 females), five male and one female genital slides, and four male slide mounts of legs and antennae have been studied.

The specimens from Curico (holotype), Arauco, Nuble, Malleco, and coastal Llanquihue have forewings with upper surfaces a slightly paler, more reddish brown than do the remaining ones from Valdivia, Osorno, inland Llanquihue, and Chiloé; the Argentinian examples are the paler form. These paler examples are from central Chile and Argentina, whereas the darker moths are more southerly in distribution. The latter tend to have the pattern on the upper surface of the forewings slightly more clearly defined than do the paler specimens.

ETYMOLOGY: The specific name is from the Greek *monotonos*, in reference to the almost unicolorous and weakly patterned forewings.

GENUS *MARTINDOELLOIA*
ORFILA AND SCHAJOVSKOY

Figures 12, 41, 66

Martindoelloia Orfila and Schajovskoy, 1963, p. 1.

DIAGNOSIS: The moths of this genus have eyes and palpi of equal size in both sexes, the front has a very long ventral tuft, and the palpi are 1.5 times as long as the diameter of the eyes. The forewings have an attenuate apex and a prominent projection on vein M₃, being deeply concave between the two; the upper surface is two shades of brown, separated by a straight, prominent t. p. line. The

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(L. E. Peña). 44. *Nucara recurva*, new species, holotype, Fundo Malcho, Chile, November 11–20, 1964 (L. E. Peña). 45. *Lacaria orfilai*, new species, holotype, Lake Nonthue, Argentina, October 12, 1952 (S. Schajovskoy) (this dissection is from a paratype of *Casbia schajovskoyi* Sperry). 46. *Franciscoia morenoi* Orfila and Schajovskoy, San Martín de los Andes, Argentina, October 1952. All AMNH; bar equals 1 mm.

male genitalia have the processes of the anellus elongate, slender, angled, and apically sclerotized; the vesica, when exerted, is T-shaped, with a single elongate spine. The female genitalia have an elongate corpus bursae, longitudinally striate posteriorly, swollen and membranous anteriorly, and the signum is straight, indented, slender, and transverse.

ADULTS: Head with eyes of both sexes of equal size, slightly smaller than width of front; front flat, not projecting beyond eyes, tightly scaled, ventrally with elongate tuft as long as eyes; palpi of both sexes rising to middle of eye, second segment 0.8 mm long, third segment 0.4 mm, being 1.5 times as long as diameter of eyes; antennae of approximately 53 to 58 segments, simple in both sexes. Thorax slender; foretibia of males with epiphysis arising about two-fifths length of segment and being two-thirds its length, of females arising at two-thirds length and being slightly more than one-third length of segment; hind tibia of males with hair pencil. Abdomen slender, extending to hind margin of hind wings in both sexes; males with row of setae on ventral surface of third segment.

Forewings broad, apex attenuate, outer margin deeply concave below apex, with strong projection at vein M_3 , margin smooth; without accessory cell or with minute cross vein to form single cell; vein R_1 free, R_2 free or from top of end of cell (when present), R_{3+4} stalked or from end of cell (when present), R_5 from R_{3+4} or from bottom of cell (when present); mdc and ldc weakly curved. Hind wings broad, weakly angled medially, with slightly scalloped margin; Sc paralleling R for seven-tenths length of cell; m and ldc rounded.

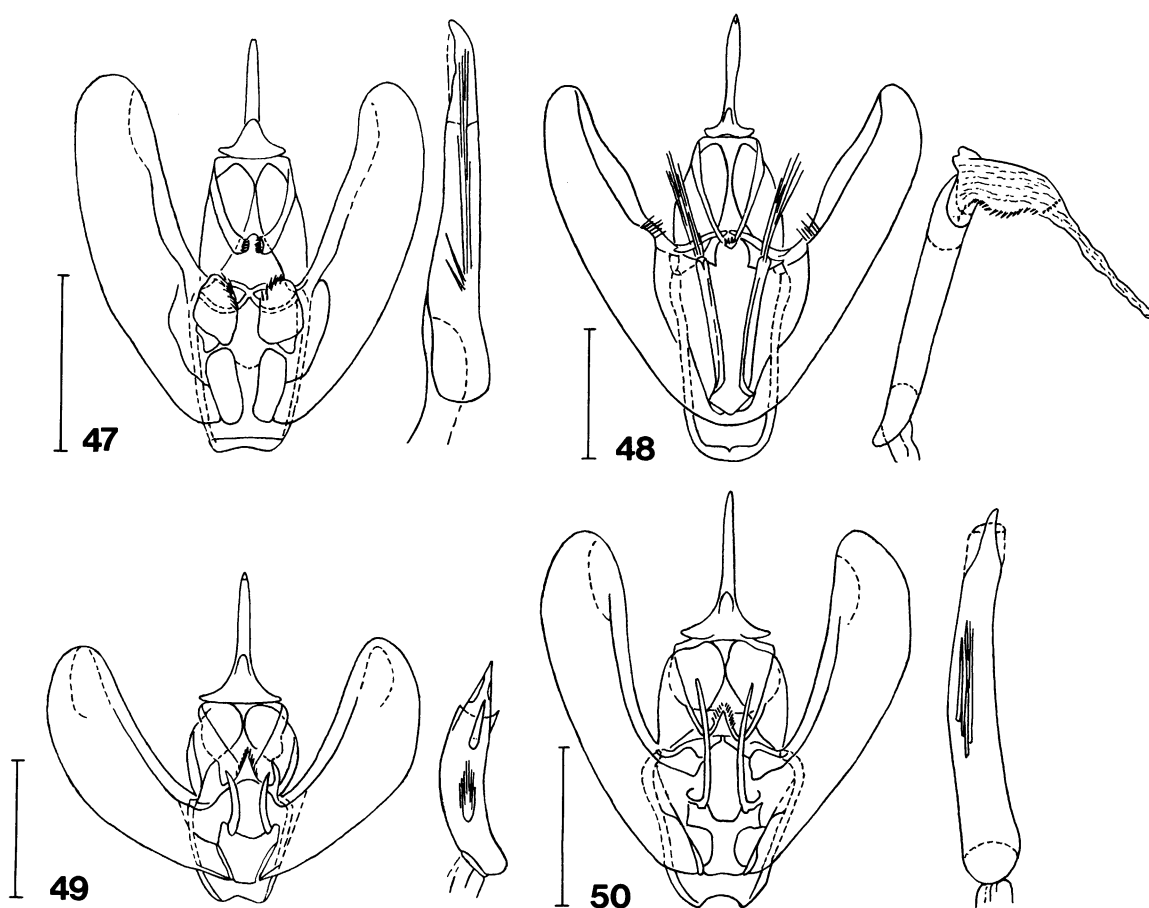
Upper surface of forewings with basal and median areas grayish brown, outer area darker brown; t. a. line obsolescent, apparently deeply dentate; median line absent; discal dot minute; t. p. line prominent, straight, partially or entirely double; subterminal area unicolorous, with obsolescent jagged s. t. line; terminal line represented by a few dark cellular dots; fringe concolorous with wing. Hind wings slightly paler than basal portion of forewings; without maculation except for faint, incomplete extradiscal line. Under surface of forewings unicolorous grayish brown, hind wings slightly pinkish brown; forewings with

faint trace of t. p. line, hind wings with discal spot and complete extradiscal line represented by venular dots.

Length of Forewings: Males, 16 to 17 mm; females, 15 to 17 mm.

MALE GENITALIA: Uncus curved, forming slightly less than 90° angle, with base 0.5 mm wide, simple, slender, slightly constricted medially, dorsolateral areas with very slender setae, apex bluntly pointed; socius small, padlike, triangular, with about eight setae on each side; gnathos V-shaped, sides broad, apical portion more heavily sclerotized, terminating in prominent posteriorly projecting spinelike point; valves simple, curved, extending to near middle of uncus, costa broadly sclerotized, slightly curved distally; transtilla slender, anterior margin weakly W-shaped, posterior margin curved, with small point of attachment at midline; processes of anellus extending half length of gnathos, slightly angled medially, posterior portion tapering and having several slender setae at apex, total length 0.5 mm; anellus sclerotized laterally and anteriorly, membranous medially; cristae prominent, arising from linear strip, about 20 to 25 on each side, 0.6 mm long, extending just beyond transtilla; tegumen rounded, each side narrow, with short anteromedian fusion; saccus twice as long as tegumen, broad, tapering anterior margin slightly rounded; aedeagus 1.9 to 2.0 mm long, 0.3 mm wide, weakly curved, posterior end sclerotized, asymmetrical, elongate, pointed; vesica, when exerted, in form of inverted T, at about 45° angle to aedeagus, upright portion of T terminating in long (0.6–0.7 mm), slender, straight spine, dorsal area at base of exerted vesica slightly sclerotized and with thick, curved spine 0.3 mm long.

FEMALE GENITALIA: Sterigma with large, membranous, funnel-shaped ostium bursae, without defined lamellae but with transverse striations medially posteriad of ostium bursae; ductus bursae with lateral margins appearing more heavily sclerotized than median area, short, slightly wider than long; ductus seminalis arising from ventral sac at posterior end of corpus bursae; corpus bursae elongate, three times as long as apophyses posteriores, posterior region slender, lightly sclerotized, and with longitudinal striations, anteriorly swollen, ovate, membranous; sig-



FIGS. 47–50. Male genitalia. 47. *Acauro rotundus*, new species, holotype, Aguas Calientes, Chile, December 17–20, 1981 (L. E. Peña). 48. *Calta lamella*, new species, San Martín de los Andes, Argentina, February 16, 1953 (J. Foerster). 49. *Euclidiodes ophiusina* (Butler), Las Trancas, Chile, December 14–15, 1976 (L. E. Peña). 50. *Yapoma chone*, new species, paratype, Río Carihueico, Chile, February 18–25, 1957 (L. E. Peña). All AMNH; bar equals 1 mm.

num flat, transverse, indented, 0.4 mm long. Papillae anales elongate, rounded posteriorly, with median attachment for apophyses; apophyses posteriores 1.1 to 1.3 mm long, apophyses anteriores 0.7 to 0.9 mm.

TYPE SPECIES: *Martindoelloia juradoi* Orfila and Schajovskoy, 1963, p. 1, pl. 2, figs. 3 (male genitalia), 4 (aedeagus), 7 (female genitalia), pl. 3, figs. 4, 5 (adult male and female); by original designation.

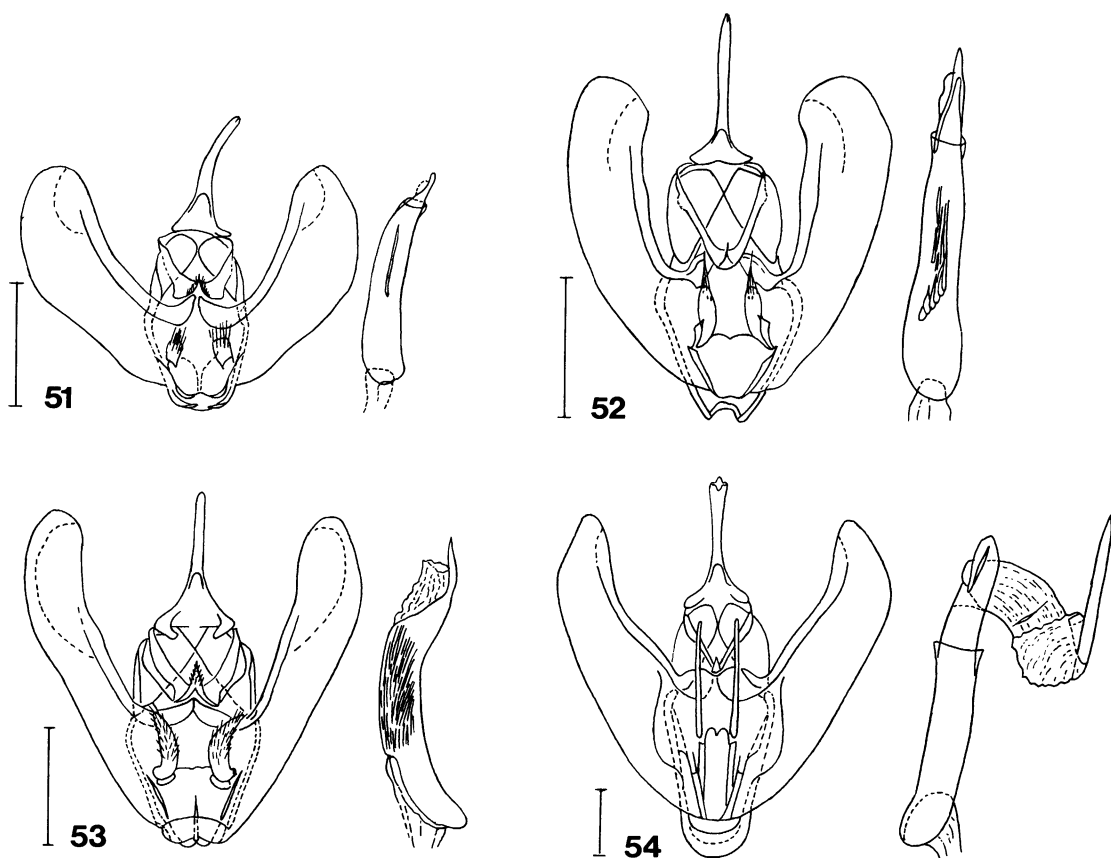
DISTRIBUTION: Argentina (Neuquen) and Chile (Curico, Bío-Bío, Llanquihue, Osorno, and Chiloé).

FLIGHT PERIOD: September through January, and March.

REMARKS: Only the type species is included in this genus.

My identification of this genus is based on four males and two females from two localities in Neuquen, Argentina, collected by Schajovskoy, and from the Sperry collection, now in the AMNH. These moths agree very well with the original description of the genus. The four males and two females from Chile, in turn, are very similar to the Argentinian specimens. The moths are very distinctive with their wing shape, the color and pattern of the forewings, and genitalia.

The present genus can be recognized by the apomorphic characters given in the tables, by



FIGS. 51–54. Male genitalia. 51. *Duraglia xanthe*, new species, holotype, Valdivia, Chile, February 22, 1959 (L. E. Peña). 52. *Laneco suffuscus*, new species, holotype, Pucatrihue, Chile, January 24–31, 1966 (L. E. Peña). 53. *Incalvertia fumipennis* (Warren), Hornohuenco, Chile, December 1968 (L. E. Peña). 54. *Catophoenissa dibapha dibapha* (Felder and Rogenhofer), Dalcahue, Chile, January 17–31, 1962 (L. E. Peña). All AMNH; bar equals 1 mm.

the keys, and the Diagnosis. Its presumed relationship to *Callemo* has been discussed under Remarks for that genus.

GUARA, NEW GENUS

Figures 13, 42, 67

DIAGNOSIS: The moths of this genus may be recognized by the elongate palpi, extending 1.0 (males) to 1.5 (females) times the diameter of the eye beyond the eyes, by the elongate ventral tuft on the front, and by the absence of the hair pencil on the hind tibia of the males. The upper surface of the forewings is gray with very sharply defined, prominent cross lines. The male genitalia have a prominently curved uncus, the valves have an elongate, extended costa, the processes of

the anellus are 0.7 mm long and needlelike, and the vesica is unarmed. The female genitalia have an elongate ductus bursae, a large membranous corpus bursae, and the signum is a very slender, elongate, transverse strip.

ADULTS: Head with eyes of males equal in width to front, eyes of females smaller than those of males; front flat, barely extending beyond eyes, tightly scaled, with elongate ventral tuft; palpi of males with second segment 0.8 mm long, third segment 0.3 mm, extending distance equal to diameter of eyes in front of eyes in males, 1.5 times in females; antennae of approximately 54 to 60 segments, simple in both sexes. Thorax slender; foretibia of males with epiphysis arising at two-thirds length of segment and equal to

two-fifths its length, of female minutely shorter; hind tibia of males without hair pencil. Abdomen slender, extending slightly beyond hind wings; males without row of setae on ventral surface of third segment.

Forewings broad, costa weakly curved, apex attenuate, outer margin with anterior portion weakly concave, with slight median angle, margin smooth; with one accessory cell; vein R_1 free, veins R_2 and R_{3+4} from end of cell, R_5 from bottom of cell; mdc and ldc biconvex. Hind wings broad, somewhat triangular, outer margin smooth except for small concavity below apex; Sc paralleling R for three-fifths length of cell; m and ldc angled.

Upper surface of forewings varying shades of gray or grayish brown, with prominent cross lines; t. a. line arising at two-fifths length of costa, going straight to vein Cu, with short outward dash on that vein, then concave to inner margin at one-fourth its length; median line absent; discal spot black, prominent; t. p. and s. t. lines arising together near apex, t. p. line curved inwardly, then going almost straight across wing to middle of inner margin, line narrowly yellowish or cream, broadly shaded distally by black; s. t. line biconcave, with subterminal area slightly darker than remainder of wing; small, black, intravenular dots present; fringe concolorous with wing. Hind wings slightly paler than forewings; without maculation except for obsolescent, incomplete median line and for complete row of spots representing extradiscal line; terminal line obsolescent; fringe concolorous with wing. Under surface gray in males, grayish brown in females, with forewings slightly darker than hind wings; maculation obsolescent, with faint s. t. and extradiscal lines weakly represented; fringes concolorous with wings.

Length of Forewings: Males, 12 to 15 mm; females, 14 mm.

MALE GENITALIA: Uncus sharply curved, making about 90° angle, base 0.2 mm wide, sides slightly tapered, with short, very thin setae laterally and posterodorsally, apex pointed; socius very small, located semimedially, rounded, with few setae; gnathos with sides of posterior portion parallel, then converging to form moderate median projection, curving ventrally, apex tending to be recurved and with elongate point; valves

broadly attached to saccus, not spreading out laterally, with elongate costa projecting posteriorly as far as middle of uncus, medioposterior area setose, valvula extending slightly more than half length of costa; transstilla somewhat triangular, tapered inwardly, with small point of attachment at midline; processes of anellus very long and slender, extending posteriorly beyond base of uncus, tapering, posterior half consisting of several long thin setae, total length 0.7 mm; anellus quadrate, elongate, lateral margins thickened to form processes; cristae prominent, arising from linear area on each side, about 40 from each area, 0.7 to 0.8 mm long, extending to or beyond middle of processes of anellus; tegumen subtriangular, about twice as wide as long, anterolateral areas swollen, median fusion indistinct; saccus more than three times as long as tegumen, quadrate, anterior margin rounded or truncate; aedeagus 1.4 to 1.5 mm long, 0.15 mm wide, anterior end slightly curved ventrally, posterior end elongate, slender, sclerotized; vesica unarmed.

FEMALE GENITALIA: Sterigma membranous, not differentiated except for a few widely spaced transverse striations medioposteriorly; ductus bursae sclerotized, large, three times longer than maximum width, asymmetrical, posterior end swollen, irregularly narrowed anteriorly; ductus seminalis arising from ventral sac to right of junction of ductus bursae and corpus bursae; corpus bursae membranous, asymmetrical, ductus bursae joining on right side posteriorly, corpus bursae swollen to left side of junction, of approximately equal width, anterior end rounded, entire structure 1.5 times length of apophyses posteriores; signum an elongate, slender, diagonal strip in anterior portion of corpus bursae, 0.5 mm long. Papillae anales wide, with anterior attachment for apophyses; apophyses posteriores 1.4 mm long, apophyses anteriores 0.6 mm.

TYPE SPECIES: *Guara rhapsis*, new species.

DISTRIBUTION: Chile.

FLIGHT PERIOD: January and March.

REMARKS: Only the type species is included in this genus.

Guara is the sole genus to have only the apomorphic characters of having cristae and being without spines in the vesica of the male genitalia, and the signum in the form of a

sclerotized strip in the female structures. Additional characters are given in the keys and Diagnosis.

ETYMOLOGY: The generic name is an arbitrary combination of letters; the gender is feminine.

***Guara rhapsis*, new species**

Figures 13, 42, 67

DIAGNOSIS: As given for the genus.

ADULTS: As described for the genus.

Length of Forewings: Holotype, 13 mm; allotype, 14 mm; male paratypes, 12 to 15 mm.

MALE GENITALIA: As described for the genus.

FEMALE GENITALIA: As described for the genus.

TYPES: Holotype, male, El Chinque, 300 m, N of Correntoso, Llanquihue, Chile, January 22, 1980 (L. E. Peña); allotype, female, La Cabaña, 550 m, coast range, Cautin, Chile, March 27, 1955 (L. E. Peña). The genitalia of the holotype are mounted on slide FHR 19,087, and of the allotype on FHR 13,243A; one antenna and a set of legs of the allotype are on FHR 13,243B. Paratypes: same data as holotype but dated January 20–25, 1980, one male; Cordillera de Piuchue, Chiloé, Chile, March 1981 (L. E. Peña), one male.

The holotype, allotype, and paratypes are in the collection of the AMNH.

DISTRIBUTION: The coastal area of central and southern Chile.

FLIGHT PERIOD: January and March.

REMARKS: Four specimens (three males, one female), two male and one female genital slides, and one slide mount of each sex for the antennae and legs have been studied.

The three specimens from Cautin and Llanquihue are smaller and paler than the single example from Chiloé. This species is very distinctly marked and, as a result, is one of the easiest of the Lithinini to recognize.

ETYMOLOGY: The specific name is from the Greek *rhapsis*, needle, in reference to the shape of the processes of the anellus.

***SIOPLA*, NEW GENUS**

Figures 14, 43, 68

DIAGNOSIS: The moths of this genus may be recognized by short palpi of equal length

in both sexes that extend two-thirds the diameter of the eyes beyond the eyes, and by the absence of the hair pencil on the hind tibia of the males. The upper surface of the forewings is gray with a brown tinge, and is without definite maculation; the hind wings are a contrasting white. The male genitalia have the uncus with a broadened apical area and with some dorsal setae, the processes of the anellus with their inner margins thickly setose, and the aedeagus with a collarlike sclerotized area distally. The female genitalia have a sclerotized median lamella postvaginalis, and the large corpus bursae has a large indented signum.

ADULTS: Head with eyes of both sexes of equal size, narrower than width of front; front flat, barely extending beyond eyes, tightly scaled, without ventral tuft; palpi of both sexes of equal size, second segment 0.5 mm long, third segment 0.3 mm, extending two-thirds diameter of eyes in front of eyes; antennae of approximately 63 segments, simple in both sexes. Thorax slender; foretibia of males with epiphysis arising at slightly more than half length of segment and being slightly less than half its length, of females arising at three-fifths length and being two-fifths length of segment; hind tibia of males with hair pencil. Abdomen slender, extending slightly beyond (males) or not quite attaining (females) hind margin of hind wings; males without row of setae on ventral surface of third segment.

Forewings broad, apex pointed, outer margin slightly rounded, smooth; with one poorly defined cell, having very short vertical vein delimiting it; vein R_1 free, R_2 from top or end of cell, R_{3+4} from middle of vertical vein at end of cell, R_5 from bottom or end of cell; mdc and ldc biconvex, joining M_3 near its origin. Hind wings broad, rounded, outer margin smooth; Sc paralleling R for about three-fifths length of cell; m and ldc rounded.

Upper surface of forewings gray, with large diffuse area of brown or reddish brown occupying most of middle of wing; without maculation except for scattered, minute dark striations and a slightly darkened area basad of middle of costa; terminal line absent; fringe concolorous with wings. Hind wings white, becoming faintly reddish brown distally; without maculation; fringe concolorous with wing. Under surface of forewings gray or

faintly brownish gray, with apical area paler and having scattered dark scales; without maculation except for dark gray discal spots; hind wings white, with scattered brown scales; maculation absent except for small discal dots; fringes concolorous on all wings.

Length of Forewings: Males, 14 to 17 mm; females, 16 to 17 mm.

MALE GENITALIA: Uncus curved, 0.7 mm long, with base 0.5 mm wide, relatively broad, simple, with slight median constriction, apical portion triangular, terminating in short transverse ridge, laterally and dorsally with sparse, very slender setae; socius shortly digitate, each with about 20 setae; gnathos V-shaped, sides with dorsal regions wide, weakly sclerotized, becoming thinner and more heavily sclerotized ventrally, apical portion slender, curved ventrally, terminating in point; valves simple, extending posteriorly beyond middle of uncus; transtilla with each lateral piece subtriangular, posterior margin evenly curved, with moderate point of attachment on midline; processes of anellus broad, curved, basal portion round, arising ventrolaterally, then sharply curved posterolaterally, and becoming flattened, extending beyond apical region of gnathos, posterodorsal surface densely setose, distal margin transverse, with thicker setae, 0.6 mm long, circular basal portion 0.2 mm wide; anellus bifurcate, divergent posteriorly, medially more heavily sclerotized than laterally, 0.4 mm long to origin of processes; cristae arising from subtriangular area, very slender, about 25 on each side, 0.5 mm long; tegumen broad, with moderate anteromedian fusion; saccus slightly longer than tegumen, weakly tapered anteriorly, anterior end broadly rounded; aedeagus 1.4 mm long, 0.2 mm wide, slightly curved and irregular in shape, posterior end narrowed, with larger sclerotized ring and less heavily sclerotized apical point; vesica with small group of very slender spines posteriad of small irregularly triangular sclerotized piece anteriorly.

FEMALE GENITALIA: Sterigma weakly sclerotized, lamella antevaginalis a weakly defined broad band, lamella postvaginalis with median area slightly more heavily sclerotized, elliptical, finely granular; ductus bursae with lateral areas appearing more heavily sclerotized than median area, square; ductus

seminalis arising from elongate, ventral, transverse sac at posterior end of corpus bursae, sac extending to right side beyond corpus by width of corpus bursae; corpus bursae with slender, lightly sclerotized posterior portion having longitudinal striations, larger anterior portion membranous, swollen, ovate, entire structure twice as long as apophyses posteriores; signum large, prominent, located on right side of corpus bursae, circular opening in granulate area of wall of corpus, invaginated, asymmetrical, tapered, margin weakly dentate. Papillae anales short, rounded, with anterior attachment for apophyses; apophyses posteriores 1.2 mm long, apophyses anteriores 0.5 mm in length.

TYPE SPECIES: *Siopla derance*, new species.

DISTRIBUTION: Chile.

FLIGHT PERIOD: December.

REMARKS: Only the type species is included in this genus. The genus can be recognized by the unique combination of apomorphic characters given in the tables for the adults and genitalia of both sexes.

ETYMOLOGY: The generic name is an arbitrary combination of letters; the gender is feminine.

Siopla derance, new species

Figures 14, 43, 68

DIAGNOSIS: As given for the genus.

ADULTS: As described for the genus.

Length of Forewings: Holotype, 16 mm; allotype, 17 mm; male paratypes, 14 to 17 mm, female paratype, 16 mm.

MALE GENITALIA: As described for the species.

FEMALE GENITALIA: As described for the species.

TYPES: Holotype, male, Las Trancas, Ñuble, Chile, December 1–15, 1976 (L. E. Peña); allotype, female, La Invernada, in mountains in Chillan area, Ñuble, Chile, December 1973 (L. E. Peña). The genitalia of the holotype are mounted on slide FHR 19,162A, and one antenna and set of legs on FHR 13,162B; of the allotype on slide FHR 19,227A, and one antenna and two legs on FHR 19,227B. Paratypes: Las Trancas, Ñuble, Chile, December 1–15, 1975 (L. E. Peña), 11 males, 1 female.

The holotype, allotype, and paratypes are in the collection of the AMNH.

DISTRIBUTION: Known only from Ñuble, Chile.

FLIGHT PERIOD: December.

REMARKS: Fourteen specimens (12 males, 2 females), one male and one female genitalic preparations, and one slide mount of each sex for the antennae and legs have been studied.

There appears to be very little individual variation in the color and maculation of the wings in the type series. The adults are recognized without difficulty by their unique coloration and lack of a definite pattern.

ETYMOLOGY: The specific name is from the Greek *derance*, collar, in reference to the configuration of the aedeagus.

NUCARA, NEW GENUS

Figures 15, 44, 69

DIAGNOSIS: The species of this genus may be recognized by the weakly serrate male antennae and simple female antennae. The upper surface of the forewings is white or grayish white, with a large brown or grayish brown area near the middle of the costa; the hind wings are paler and contrasting in color. The male genitalia have a sharply curved uncus, a V-shaped gnathos with a prominent longitudinal ridge, and the surfaces of the processes of the anellus are setose. The female genitalia have a small ductus bursae, with its width equal to its length, a large corpus bursae with the short posterior portion longitudinally striate, and with a small, rounded, invaginated signum having the outer margin rayed.

ADULTS: Head with eyes of males equal in width to front, of females smaller than those of males; front flat, barely extending beyond eyes, tightly scaled, without ventral tuft; palpi of both sexes of equal size, second segment 0.5 mm long, third segment 0.2 to 0.3 mm, extending three-fourths diameter of eyes in front of eyes in males, slightly less than to equal to diameter of smaller eyes of females; tongue normal or reduced; antennae of approximately 50 to 54 segments, weakly serrate in males, simple in females. Thorax slender; foretibia of males with epiphysis arising slightly beyond middle of segment and being two-fifths length, of females arising at three-fifths length of segment and being two-fifths

as long; hind tibia of males with hair pencil. Abdomen slender, extending slightly beyond (males) or not quite attaining (females) hind margin of hind wings; males with row of setae on ventral surface of third segment.

Forewings broad, apex pointed, outer margin rounded or weakly angulate, smooth; without accessory cell; vein R_1 variable, either free, going to R_s , or stalked with R_2 , R_2 stalked or free, R_{3+4} stalked, R_5 from R_{3+4} ; mdc and ldc rounded or weakly biconvex. Hind wings broad, rounded; Sc paralleling R for about three-fifths length of cell; m and ldc flatly rounded.

Upper surface of forewings white or grayish white, with variable amount of brown or grayish brown scaling; maculation consisting of large brown or dark grayish brown area near middle of costa, subtriangular or quadrangular, sometimes with lower part pinched off and left as circular spot; with faintly darkened area on costa before apex and, in some specimens, along outer margin; s. t. line obsolescent or absent; terminal line of intravascular spots; fringe gray or concolorous with wings. Hind wings white, with some gray or brown scales; without maculation except for one or two small dark spots on costa before apex; terminal line either absent or weakly represented; fringe as on forewings. Under surface whitish to faintly brownish white, with hind wings slightly paler and with scattered dark scales; forewings with maculation of upper surface faintly reflected; hind wings with small discal spot and obsolescent extradiscal line; terminal lines and fringes similar to those of upper surface.

Length of Forewings: Males, 11 to 14 mm; females, 12 to 13 mm.

MALE GENITALIA: Uncus sharply curved, forming almost 90° angle, with base 0.35 mm wide, tapering from base to about middle, distal portion with parallel sides, apex with small transverse ridge; socius digitate, 0.2 mm long, each with about 25 setae; gnathos V-shaped but with anterior margin rounded, sides broad, uniting medially to form raised, elongate, very weakly dentate ridge; valves simple, elongate, extending posteriorly at least as far as distal portion of curved uncus; transstilla with each lateral piece having anterior lobe, elongate, with small point of attachment medially; processes of anellus recurved,

arising ventrally for short distance, then sharply curved posteriorly, tapering in width posteriorly, entire surface with numerous elongate, slender setae, 0.40 to 0.65 mm long; anellus in form of two lateral sclerotized pieces extending to base of each process, diverging posteriorly; cristae arising from linear or rounded area on each side and 20 to 30 in number, 0.6 to 0.8 mm long; tegumen elongate, with short anteromedian fusion; saccus broader than tegumen posteriorly, only slightly longer than tegumen, tapering anteriorly, and with median indentation; aedeagus 1.4 to 1.6 mm long, 0.2 to 0.3 mm wide, straight, posterior portion with constriction, distal part an elongate oval, sclerotized laterally, terminating in elongate point; vesica with area of 15 to 30 elongate slender spines, diagonally or longitudinally situated, 0.3 to 0.6 mm long, at least partially deciduous.

FEMALE GENITALIA: Sterigma with membranous lamella antevaginalis, lamella postvaginalis sclerotized, fused with sides of abdominal segment 8, with a few vertical striations, slightly differentiated medially, in form of incomplete lobe; ductus bursae small, lateral areas appearing more heavily sclerotized than median area, asymmetrical, left side longer than right; ductus seminalis arising from ventral, transverse lobe at posterior end of corpus bursae, appearing as continuation of corpus and extending beyond right side of that structure; corpus bursae with narrowed posterior portion, weakly sclerotized, with numerous, deep longitudinal striations, anterior portion swollen, membranous, elliptical or oval, entire structure two to three times longer than apophyses posteriores; signum in granular area on right side of corpus, small and round on surface, invaginated and enlarged, especially anteriorly, outer margin weakly dentate. Papillae anales elongate, with median attachment for apophyses; apophyses posteriores 1.0 to 1.1 mm long, apophyses anteriores 0.5 to 0.6 mm.

TYPE SPECIES: *Nucara recurva*, new species.

DISTRIBUTION: Central and southern Chile.

FLIGHT PERIOD: September, October, November, and December.

REMARKS: Due to the lack of adequate material, it is not certain how many species are represented in this genus. It is possible that there are four; none is represented by more

than five specimens, and for one no males are known to me. From what can be determined from this material, the species are inclined to be very variable in maculation; we cannot be absolutely certain about the variability of the genitalia because of the lack of specimens.

The males of this genus have serrate antennae, an apomorphic state that is shared with *Lacaria*. The members of the latter genus have the additional apomorphic characters of having the male genitalia with distal end of the costa swollen or projecting and, in the female structures, having a median attachment of the apophyses posteriores to the papillae anales. The species of *Nucara* are structurally similar to those of *Acauro* and *Yapoma* but may be separated from them by the form of the male antennae and by the apomorphic characters of the male genitalia; the color and pattern of the upper surface of the wings will also serve to separate these groups.

ETYMOLOGY: The generic name is an arbitrary combination of letters; the gender is feminine.

Nucara recurva, new species

Figures 15, 44, 69

DIAGNOSIS: As given for the genus.

ADULTS: Thorax with foretibia of male with epiphysis arising slightly beyond middle of segment and being two-fifths its length, of females arising at three-fifths and being two-fifths its length.

Upper surface of forewings grayish white, with variable amount of brown scaling; maculation consisting of prominent brown subtriangular area near middle of costa, posterior portion either constricted or with separate small circular spot; costa with either darkened area near apex (male) or with this obsolescent (females). Hind wings white, with two minute dots on costa before apex. Under surface with forewings faintly brownish white, hind wings slightly paler and with scattered dark scales; forewings with maculation of upper surface faintly reflected; hind wings with small discal spot and obsolescent or incomplete extradiscal line.

Length of Forewings: Holotype, 11 mm; allotype, 13 mm; paratype, female, 13 mm.

MALE GENITALIA: Processes of anellus recurved, elongate, slender, tapering, 0.65 mm long, extending to central portion of gnathos; cristae arising from linear area on each side, approximately 20 per side, 0.6 mm long; aedeagus 1.4 mm long, 0.3 mm wide; vesica with flattened, rounded, longitudinal area of approximately 30 slender spines, 0.3 mm in length.

FEMALE GENITALIA: Ductus bursae with posterior portion lightly sclerotized, connecting lateral margins, with length of structure about equal to its width; corpus bursae with elliptical anterior portion; signum very small on surface of corpus, invaginated portion noticeably larger, especially anteriorly. Apophyses posteriores 1.1 mm long, apophyses anteriores 0.5 mm.

TYPES: Holotype, male, and allotype, female, Fundo Malcho, in mountains of Parral area, Linares, Chile, November 11–20, 1964 (L. E. Peña). The genitalia of the holotype are mounted on slide FHR 19,258A, and one antenna and set of legs on FHR 19,258B; of the allotype on slide FHR 19,460A, and one antenna and set of legs on FHR 19,460B. Paratype: El Coigo, in Andes, Cordillera Curico, Curico, Chile, September 1959 (L. E. Peña), one female.

The holotype, allotype, and paratype are in the collection of the AMNH.

DISTRIBUTION: Mountainous areas of Linares and Curico, Chile.

FLIGHT PERIOD: September and November.

REMARKS: Three specimens (one male, two females), three genitalic slide mounts and three of antennae and legs have been studied.

The holotype is rather worn, but the male genitalia are more distinctive than those of the females. In maculation, the allotype has the dark subtriangular area of the forewings complete, the paratype has the anterior portion sharply constricted, and the holotype has a small spot separate from the triangular area.

In maculation, the members of this species have the most clearly defined and contrasting maculation of the genus, the male genitalia have the longest processes of the anellus (although the male of one species is unknown to me), and the female genitalia are the only ones with the posteriorly sclerotized portion

of the ductus bursae, and have the largest signum.

ETYMOLOGY: The specific name is from the Latin *recurvus*, recurved, in reference to this characteristic of the processes of the anellus.

GENUS *LACARIA* ORFILA AND SCHAJOVSKOY
Figures 16, 17, 45, 70

Lacaria Orfila and Schajovskoy, 1959, p. 198.

DIAGNOSIS: The species of this genus may be recognized by the antennae being serrate in males and simple in females; the proboscis may be either normal or reduced. The upper surface of the forewings is variably gray or brown, with the maculation usually being weakly represented; the hind wings are contrastingly white, with a variable number of gray or brown scales, and have obsolescent maculation. The male genitalia have a sharply curved uncus, the valves have a short apical costal extension, and the variably shaped processes of the anellus have either setose or spinose surfaces, or both. The female genitalia have heavily sclerotized lamellae, a large broad corpus bursae, and a prominent, invaginated, asymmetrical signum.

ADULTS: Head with eyes of males not as wide as width of front, of females slightly smaller than those of males; front flat, barely extending beyond eyes, tightly scaled, without ventral tuft; palpi of males with second segment 0.4 to 0.5 mm long, third segment 0.2 to 0.3 mm, extending from one-fourth to one-half diameter of eyes in front of eyes in males, one-third to three-fourths times the diameter in females; tongue normal or reduced; antennae of approximately 45 to 59 segments, serrate in males, simple in females. Thorax slender; foretibia of males with epiphysis arising between three-fifths and two-thirds length of segment and being from two-fifths to one-half its length, of females three-fifths to seven-tenths length and one-third to two-fifths length of segment; hind tibia of males with or without hair pencil. Abdomen slender, extending only to (males) or not quite attaining (females) hind margin of hind wings; males either with deciduous row of setae on ventral surface of third segment or without it.

Forewings broad, outer margin rounded,

smooth; without accessory cell; veins R_1 and R_2 free, R_{3+4} stalked, R_5 from R_{3+4} ; mdc and ldc rounded, angled, or weakly biconvex. Hind wings broad, outer margin weakly angled, smooth; Sc paralleling R for one-half to three-fifths length of cell; m and ldc rounded or angled.

Upper surface of forewings variably gray or brown; cross lines usually weakly represented; t. a. line angulate or dentate; median area slightly darker than adjacent wing areas, without median shade line; discal spot tending to be prominent, rounded or angulate, ranging from black to orange; t. p. line irregular, often protruding on veins M_3 and Cu_1 ; s. t. line obsolescent, often indicated by darker terminal area of wing; terminal line black, interrupted by veins; fringe concolorous with wings. Hind wings white, with variable number of gray scales, contrasting with forewings; with weakly represented discal spot and partial extradiscal line; terminal line and fringe similar to those of forewings. Under surface of forewings gray or grayish brown, often with small discal dot, partial t. p. line, and dark subapical spot on costa; hind wings grayish white, with scattered dark gray or brown scales, and having large discal spot and extradiscal line; terminal line and fringes similar to those of upper surface.

Length of Forewings: Males, 13 to 17 mm; females, 12 to 16 mm.

MALE GENITALIA: Uncus curved, forming approximately 90° angle, with base 0.3 to 0.4 mm wide, slender, simple, sides parallel, with either rounded or laterally flattened posterior portion, apex with minute transverse ridge; socius small, weakly defined, each side with from 5 to 20 setae; gnathos large, heavily sclerotized, V-shaped, apical portion attenuate, recurved, apex either a short, blunt point or sharply pointed and with small spines on posteroventral ridge; valves with heavily sclerotized costa, its apex either flattened and diagonal or curved, in some species extending slightly beyond valve, valvula simple, sacculus widened, weakly sclerotized; transtilla slender, with small point of attachment on midline; processes of anellus variable, either slender and curved or more heavily sclerotized, straight, widened posteriorly, surface with setae and/or spines, 0.3 to 0.9 mm long;

anellus either V-shaped or roughly triangular; cristae arising from linear area, with from about 7 to 15 very slender setae on each side, 0.4 to 0.6 mm long; tegumen short, antero-lateral portions rounded, with short antero-median fusion; saccus elongate, at least twice as long as tegumen, gently tapered, anterior margin rounded; aedeagus 1.2 to 1.7 mm long, 0.2 to 0.3 mm wide, both ends curving ventrally, median portion tending to be swollen, posterior end sclerotized, either bluntly pointed or attenuate and more sharply pointed; vesica with variable number of deciduous setae medially, 0.3 to 0.7 mm long, their bases apparently associated with twisted, sclerotized plate, some species with second group of short spines apically.

FEMALE GENITALIA: Sterigma with prominent, sclerotized lamella antevaginalis, U-shaped, raised, connected to sclerotized, concave, lateral margins or U-shaped posterior end of abdominal segment 7, lamella postvaginalis attached laterally to lamella antevaginalis, sclerotized, sides flat, slender, medially variably narrowed; ductus bursae sclerotized, slightly longer than wide or square, sides somewhat tapered, ventroposterior margin with median concavity, laterally flared; ductus seminalis arising from small ventral sac at posterior end of corpus bursae; corpus bursae asymmetrical, short posterior end relatively slender, sclerotized, with variable number of longitudinal striations, slightly swollen on right side anteriorly, large anterior portion of corpus bursae membranous, ovate or elliptical, entire structure about two to three times longer than apophyses posteriores; signum on left side of corpus bursae prominent, asymmetrical, anterior lip protruding from finely granulate wall of corpus, inner surface flat, anterior portion enlarged and with prominent rays. Papillae anales short to moderately long, with anteromedian attachment for apophyses; apophyses posteriores 1.0 to 1.4 mm long, apophyses anteriores 0.1 to 0.3 mm.

TYPE SPECIES: *Lacaria araucanaria* Orfila and Schajovskoy; by original designation.

DISTRIBUTION: Central Chile and adjacent Argentina.

FLIGHT PERIOD: September into January, April, and May. The last two months are for

specimens caught in low coastal areas; they should be verified.

REMARKS: The males of this genus have serrate antennae, an apomorphic character shared with *Nucara*; see Remarks under the latter genus (above) for means of distinguishing the two genera. *Lacaria* can also be recognized by the characters given in the tables, keys, and the Diagnosis.

Five species, all described as new to science, were placed in *Lacaria* by Orfila and Schajovskoy (1959) when they described the genus; all were from Parque Nacional Lanin, Neuquen, Argentina. These were in addition to *Casbia schajovskoyi* Sperry (1954), described from Lago Nonthue in the same national park, which were collected by Schajovskoy. The species in this genus are very similar to one another in color, maculation, and size; the genitalia have to be studied to be certain of identifications. The type series of *schajovskoyi* is in the AMNH, including the holotype, allotype, and 28 paratypes (14 males, 14 females); this series apparently represents five different species.

Orfila and Schajovskoy (op. cit.) misidentified Sperry's species and redescribed it as *monrosi*; the latter name is hereby placed as a synonym of *schajovskoyi*. This leaves the species misidentified as *Lacaria schajovskoyi* by Orfila and Schajovskoy (1959, p. 200, figs. 1 [venation], 2–5 [male and female genitalia], pl. 1, figs. 1, 2 [adults]) without a name. I hereby name this moth *Lacaria orfilai*, new species. The holotype, male, is from L[ago] Nonthue, Neuquen, Argentina, October 12, 1952 (S. Schajovskoy); the allotype, female, is from the same locality but is dated October 27, 1952. The genitalia of the holotype are mounted on slide FHR 19,092A, with one antenna and a set of legs on slide FHR 19,092B; of the allotype on slide FHR 19,187A, with one antenna and a set of legs on slide FHR 19,187B. Paratypes: same data and collector as the holotype, dated October 7, 8, 1951, November 28, 1951, December 1, 1951, September 11, 12, 13, 1952, October 12, 17, 1952, five males, five females. All the above specimens are labeled as paratypes of *Casbia schachovskoyi* [sic] Sperry (the spelling of the specific name was emended to *schajovskoyi* by Orfila and Schajovskoy, 1959, p. 200); they are in the collection of the AMNH.

Assuming that the descriptions and figures by Orfila and Schajovskoy (op. cit.) are based on their holotypes, Sperry's type series of *schajovskoyi* included specimens of *monrosi* (= *schajovskoyi* Sperry), *schajovskoyi* (= *orfilai*, new species), and *araucanaria* Orfila and Schajovskoy; in addition, there are two species that have not been assigned specific names.

When material from Chile is examined and dissected, another five or six species are added to the genus; all are apparently undescribed. The only species common to both Argentina and Chile is *picuncharia* Orfila and Schajovskoy (although I have not studied any material from the former country). It is obvious that much more material is needed in this genus, and more study is required before the taxonomy can be settled.

GENUS FRANCISCOIA

ORFILA AND SCHAJOVSKOY

Figures 18, 46, 71

Franciscoia Orfila and Schajovskoy, 1963, p. 3.

DIAGNOSIS: The moths of this genus may be recognized by the small metathoracic tufts, by the long scaled front having a ventral tuft, and by the short palpi. The upper surface of the forewings is brown, and has three prominent, dark cross lines; the hind wings are a contrasting white, without maculation. The male genitalia have an elongate gnathos, equal in length to the length of the uncus, the cristae are very numerous and elongate, and the very long, slender processes of the anellus are longer than the uncus. The female genitalia have a median attachment of the apophyses posteriores to the papillae anales, the ductus bursae is twice as long as wide and is dorsoventrally flattened, and the very long and slender corpus bursae has a small anterior signum.

ADULTS: Head with eyes of males not as wide as width of front, of females slightly smaller than those of males; front flat, barely extending beyond eyes, long scaled, with ventral tuft; palpi of males with second segment 0.5 mm long, third segment 0.1 mm, extending one-half diameter of eyes in front of eyes in males, two-thirds times the diameter in females; antennae of approximately 53 to 59 segments, simple in both sexes. Thorax slender, with small metathoracic tufts posteriorly; foretibia of both sexes with epiphysis aris-

ing at three-fifths length of segment and being about two-fifths its length, with females being slightly shorter than those of males; hind tibia of males without hair pencil. Abdomen relatively slender, extending only to (males) or not quite attaining (females) hind margin of hind wings; males without row of setae on ventral surface of third segment.

Forewings broad, apex pointed, outer margin angled, scalloped; without accessory cell; vein R_1 to R_s , R_2 free, R_{3+4} stalked, R_5 from R_{3+4} ; mdc and ldc rounded or weakly biconvex. Hind wings broad, outer margin weakly angled, concave below apex; Sc paralleling R for one-half length of cell; m and ldc angled.

Upper surface of forewings reddish to grayish brown, with three prominent dark cross lines; basal line obsolescent, straight; $t. a.$ line evenly curved; median area concolorous with remainder of wing, having rather diffuse median line, varying from being straight to slightly curved; discal dot small, dark; $t. p.$ line straight or weakly curved, shaded distally with a slender cream-colored band; subterminal area with faint indication of $s. t.$ line, being indicated primarily by slight change in color of area; terminal line absent; fringe dark gray. Hind wings white or with very faint brownish tinge; maculation absent or with faint discal dot and trace of extradiscal line; terminal line absent; fringe variable, gray or concolorous with wing. Under surface of all wings reddish brown; maculation of upper surface weakly reflected, being stronger on hind wings than on forewings; terminal line absent; fringes similar to those of upper surface.

Length of Forewings: Males, 12 to 14 mm; females, 13 to 15 mm.

MALE GENITALIA: Uncus strongly curved, with base 0.4 mm wide, slender, slightly tapered, dorsal surface with numerous, very slender setae, apex with sharp point; socius small, with about 10 setae on each side; gnathos V-shaped, sides slender, apical portion curved ventrally, with numerous short thick spines, apex rounded; valves simple, elongate, extending posteriorly as far as end of uncus, costa weakly sclerotized, enlarged in basal half; transtilla with each lateral piece swollen, sclerotized around outside, giving appearance of a flattened circle, rodlike medially; processes of anellus slender, sclero-

tized, very long—1.0 to 1.1 mm, extending beyond transtilla, each base widened, rodlike for almost entire length, apically flattened and with diagonal apex; anellus very short, wider than long; cristae very slender, 1.25 to 1.50 mm long, extending posteriorly to between middle of gnathos and base of uncus, arising from linear strip, approximately 75 in total number; tegumen with sloping sides, very short anteromedian fusion; saccus less than twice as long as tegumen, broad posteriorly, narrowing anteriorly, with anterior half having parallel sides, anterior margin concave dorsally, W-shaped ventrally; aedeagus 1.9 mm long, 0.15 mm wide, slightly S-shaped, posterior end lightly sclerotized, slightly rounded medially; vesica with single large spine, 0.6 mm long, posteriorly and apically with minute spines.

FEMALE GENITALIA: Sterigma membranous, with transverse striations medially posterior of ductus bursae; ductus bursae sclerotized, very flat, slightly undulating, twice as long as wide, posterior margins flared, sides parallel, anteriorly joined to ventral portion of corpus bursae; ductus seminalis arising from right side of posterior portion of corpus bursae dorsad of ductus bursae; corpus bursae very long, four times as long as apophyses posteriores, slender, membranous except for weakly sclerotized dorsal portion medially, anterior end slightly enlarged, ovate; signum small, near end of ovate portion of corpus bursae, round, recessed, with a few small rays. Papillae anales moderately long, with median attachment for apophyses; apophyses posteriores 0.9 mm long, apophyses anteriores 0.5 mm.

TYPE SPECIES: *Franciscoia morenoi* Orfila and Schajovskoy, 1963, p. 5, pl. 1, fig. 4 (venation), pl. 2, figs. 3 (male genitalia), 5 (aedeagus), 8 (female genitalia); by original designation.

DISTRIBUTION: Argentina (Neuquen) and Chile (Curico, Linares, Nuble, Talca, and Valdivia).

FLIGHT PERIOD: From September into January, and March.

REMARKS: Only the type species is placed in this genus.

Orfila and Schajovskoy, in their Diagnosis for *Franciscoia*, state that this genus is related to *Proteopharmacis* (placed as a synonym of

Odontothera in the present paper) and may be distinguished from the latter by the coalescence of veins Sc and R_1 in the forewings. This venational character is present in three of the six species that I am including in *Odontothera*; further, the venation is so variable in so many of the Ennominae that I would hesitate to use it for a diagnostic character. There are a number of apomorphic characters that distinguish *Franciscoia*; these are given in the tables. Additional distinguishing characters are to be found in the keys and in the Diagnosis. No other species in the tribe has the wing shape, color, and maculation of *morenoi*.

ACAURO, NEW GENUS

Figures, 19, 47, 72

DIAGNOSIS: The species of this genus may be recognized by the form of the gnathos, with its prominent inverted U at the midline, and by having the lateral margins of the U with numerous, thick, heavily sclerotized spines. The moths are relatively large, with the forewing length 14 to 18 mm; the forewings have a prominently angled outer margin. Characters of the male genitalia, in addition to the gnathos, are that the uncus is sharply curved and the processes of the anellus are setose and have a spinose apex. The female genitalia have a long, slender, longitudinally striate, sclerotized portion of the corpus bursae extending into the much smaller anterior portion; the latter has a small and prominent invaginated signum.

ADULTS: Head with eyes of males as wide as width of front, of females narrower than front; front flat, barely extending beyond eyes, tightly scaled, without ventral tuft; palpi of males with second segment 0.3 to 0.4 mm long, third segment 0.2 mm, extending between one-fourth and one-half diameter of eyes in front of eyes in males, two-fifths to one-half times the diameter in females; antennae of approximately 55 to 59 segments, simple in both sexes. Thorax slender; foretibia of males with epiphysis arising at three-fifths length of segment and being almost two-fifths its length, of females arising at two-thirds length and being one-third length of segment; hind tibia of males with hair pencil. Abdomen relatively slender, extending to about hind margin of hind wings in both

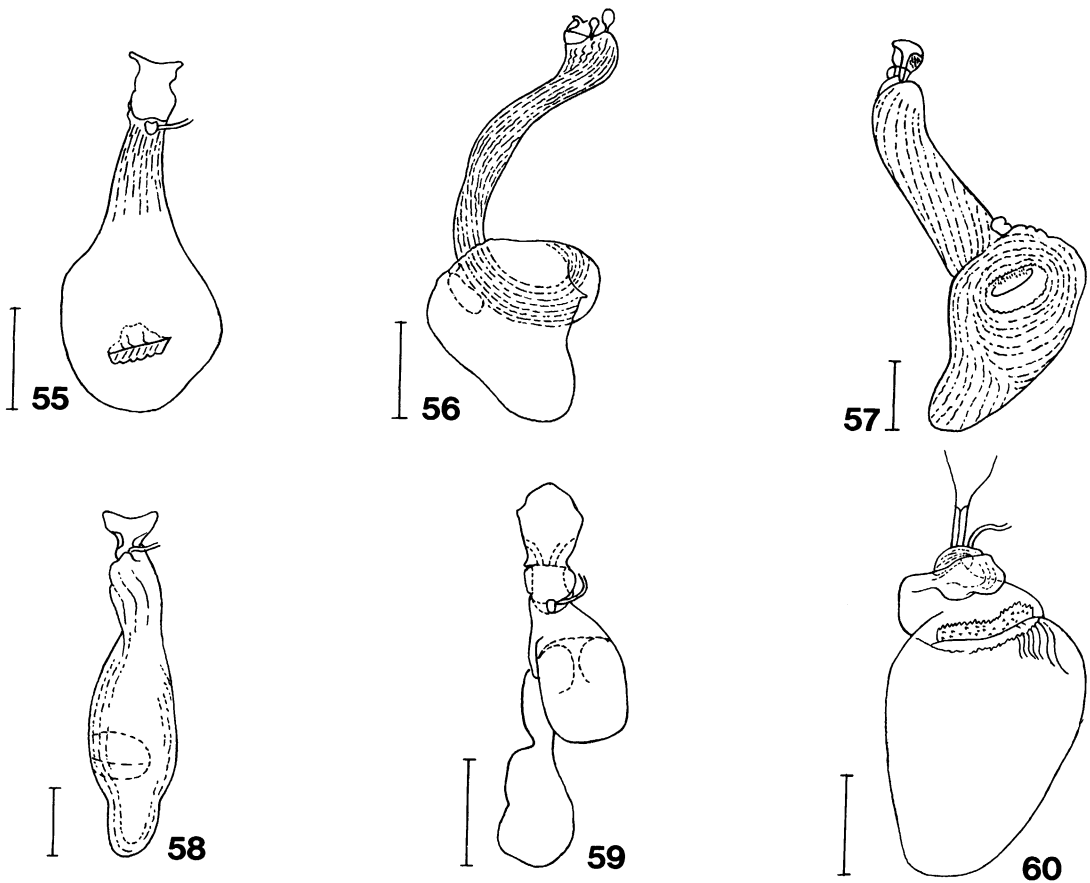
sexes; males with deciduous row of setae on ventral surface of third segment.

Forewings broad, apex pointed, outer margin concave to strong projection at vein M_3 , lower portion oblique, entire margin smooth; without accessory cell; veins R_1 and R_2 free, R_{3+4} stalked, R_5 from R_{3+4} ; mdc and ldc bi-convex. Hind wings broad, outer margin weakly angled, concave below apex; Sc paralleling R for half or slightly more than length of cell; m and ldc rounded.

Upper surface of forewings brown or grayish brown, some specimens variably suffused with dull yellow, with maculation weak to obsolescent; t. a. line varying from curved to angulate or dentate; median shade line absent; discal dot present, small; t. p. line outwardly angled from costa, then generally curved and dentate to above inner margin, with outwardly projecting swelling above margin; subterminal area either concolorous with remainder of wing or with basal portion variably suffused with yellow or reddish brown scales; s. t. line varying from obsolescent to completely represented, in form of triangular white intravenular spots; terminal line absent; fringe concolorous with wing. Hind wings contrastingly whitish, with a few scattered gray scales; maculation absent or obsolescent; terminal line and fringe similar to those of forewings. Under surface of forewings gray or grayish brown, becoming browner distally, with or without distinct t. p. and s. t. lines; hind wings pale grayish brown, suffused with dark brown scales, with prominent discal spot, partial to complete extradiscal line and with partial s. t. line; terminal lines absent; fringes either concolorous with wings or with dark venular spots.

Length of Forewings: Males, 14 to 18 mm; females, 16 to 18 mm.

MALE GENITALIA: Uncus sharply curved, forming about 90° angle, with base 0.5 mm wide, slender, simple, either weakly constricted posteriorly of base or slightly tapered, with short ridge medially on inner surface, leading to pointed apex; socius shortly digitate, with about 10 to 12 setae on each one; gnathos with wide lateral sides parallel posteriorly, rounded medially, broad, with prominent inverted U at midline extending to posterior margin of gnathos, lateral margins of U with numerous, thick, heavily scler-



FIGS. 55–60. Female genitalia. 55. *Philedia punctomacularia* (Hulst), Wellington, British Columbia, September 4, 1949 (R. Guppy). 56. *Petrophora divisata* Hübner, Ocean Co., New Jersey, May 10, 1942 (O. Buchholz). 57. *Tacparia zalissaria* Walker, Lakehurst, New Jersey, June 21–30 (F. Lemmer). 58. *Tacparia atropunctata* (Packard), East Wareham, Massachusetts, July 1, 1968 (C. Kimball). 59. *Gueneria basitaria* Walker, nr. Beartown, Vermont, June 4, 1951 (F. H. Rindge). 60. *Homochlodes disconventa* (Walker), Mt. Lake Biological Station, Virginia, July 16, 1956 (R. Zweifel). All AMNH; bar equals 1 mm.

otized spines; valves simple, broad, extending posteriorly to about middle of uncus; transtilla with anterior margin angled, quadrate or elongate, posterior margin either concave medially or rounded, both with short point of attachment on midline; processes of anellus variable, either short, very broad, with length about equal to width, surface with numerous short setae and with posterior margin broadly rounded and thickly spinose, or long and slender, extending to gnathos, 1.2 mm in length, apical portion with many flat, appressed, triangular setae; anellus variable, either two long, lateral, concave, divergent sclerotized bands, or short, mostly vertical

U-shaped piece; cristae slender, elongate, 1.0 to 1.2 mm in length, extending to gnathos, arising from elongate ellipse, approximately 15 to 40 on each side; tegumen elongate, with short anteromedian fusion; saccus equal to or slightly longer than tegumen, tapered, anterior margin truncate or rounded; aedeagus 2.2 to 2.3 mm long, 0.2 mm wide, straight or slightly curved, posterior end weakly sclerotized, bluntly pointed; vesica with spines for three-fourths length of aedeagus, either an anterior cluster and several very long slender spines, or one long thick anterior spine and group of 12 to 15 shorter posterior ones.

FEMALE GENITALIA: Sterigma membra-

nous, with or without finely spiculate area on each side of ostium bursae; ductus bursae either short, with lateral areas appearing more heavily sclerotized than median area, or elongate, about twice as long as wide, very flat, undulating, both types tapering anteriorly; ductus seminalis arising from ventral sac at posterior end of corpus bursae; corpus bursae with slender, sclerotized, longitudinally striate posterior portion joining anterior portion in spreading, shortly recurved area, anterior portion more or less ovate, shorter than posterior portion, either membranous or with ventral surface sclerotized and longitudinally striate, entire structure 2.0 to 2.5 times longer than apophyses posteriores; signum absent in sclerotized corpus bursae, present in membranous anterior portion, set in granular area, large, subtriangular, invaginated, inner surface and rim with rays. Papillae anales elongate, slender, with anterior attachment for apophyses; apophyses posteriores 1.4 mm long, apophyses anteriores 0.5 to 0.7 mm in length.

TYPE SPECIES: *Acauro rotundus*, new species.

DISTRIBUTION: Central and southern Chile.

FLIGHT PERIOD: August, December, and January.

REMARKS: Two species are included in this genus. They may be recognized, from the male genitalia, by the autapomorphic shape of the gnathos, as described in the keys, Diagnosis, and description; additional apomorphic characters are given in the tables. The two included species are quite similar to each other in color and maculation, but the processes of the anellus and the corpus bursae of the two are very different; I have placed them in the same genus primarily on the basis of the shape of the gnathos, and secondarily by their closely similar appearance.

ETYMOLOGY: The generic name is an arbitrary combination of letters; the gender is masculine.

Acauro rotundus, new species

Figures 19, 47, 72

DIAGNOSIS: The length of the forewings varies from 15 to 18 mm; the processes of the anellus are rounded, and a prominent signum is present in the membranous anterior portion of the corpus bursae.

ADULTS: As described for the genus; upper surface of forewings brown or grayish brown, without yellow suffusion.

Length of Forewings: Holotype, 18 mm; allotype, 18 mm; male paratypes, 15 to 18 mm, female paratypes, 17 to 18 mm.

MALE GENITALIA: Uncus slightly tapered; processes of anellus short, very broad, with length about equal to width, surface with numerous short setae and with posterior margin broadly rounded and thickly spinose; anellus a pair of long, lateral, concave, divergent sclerotized bands, 0.4 mm long; cristae arising from rounded area, approximately 40 on each side, 1.0 mm in length; vesica with single group of slender spines, approximately eight in number, plus anterior cluster of much shorter spines.

FEMALE GENITALIA: Sterigma with finely spiculate area on each side of ostium bursae; ductus bursae short, with length about equal to width, lateral areas appearing more heavily sclerotized than median area; corpus bursae with membranous anterior portion; signum set in granular area, large, subtriangular, invaginated, inner surface and rim with rays. Apophyses anteriores 0.7 mm long.

TYPES: Holotype, male, Aguas Calientes, 500 m, Puyehue, Osorno, Chile, December 17–20, 1981 (L. E. Peña); allotype, female, same data but December 12–17, 1981. The genitalia of the holotype are mounted on slide FHR 19,192A, with one antenna and four legs on FHR 19,192B; the genitalia of the allotype are on slide FHR 19,247A, with one antenna and set of legs on FHR 19,247B. Paratypes, all from Chile, and collected by L. E. Peña: same data as holotype, dated December 12–17, 17–20, 12–20, 1981, January 1–5, 2–6, 1982, 32 males, one female; Pucatrihue (coastal town), Osorno, January 1971, one male; Anticura, 450 m, on Río Goigol, Osorno, August 26, 1983, one male; Fundo La Selva, 700 m, W of Temuco, Cautin, December 10–12, 1981, one male.

The holotype, allotype, and paratypes are in the collection of the AMNH.

DISTRIBUTION: This species is known only from the central valley and coastal mountains of Osorno and Cautin, Chile, at elevations of 400 to 700 m.

FLIGHT PERIOD: August, December, and January. There is but a single specimen dated

in late August, with all the remainder of the series being dated from mid-December into early January.

REMARKS: Thirty-nine specimens (36 males, 3 females), one male and one female genitalic slides, and one male and one female slide mounts of antennae and legs have been studied.

The sister species of *rotundus* is quite similar in color and appearance but is smaller, with the forewing length of the males being 14 to 16 mm, and of the females 16 mm. The genitalia of the two species are markedly different from each other, especially the shape of the processes of the anellus and the posterior portion of the ductus bursae. Both species fly together at Aguas Calientes, the type locality of *rotundus*. In addition, the sister species is known from Llanquihue, Valdivia, and Chiloé, Chile, with all captures having been made in December and January.

ETYMOLOGY: The specific name is from the Latin *rotundus*, round, which refers to the shape of the processes of the anellus.

CALTA, NEW GENUS

Figures 20, 48, 73

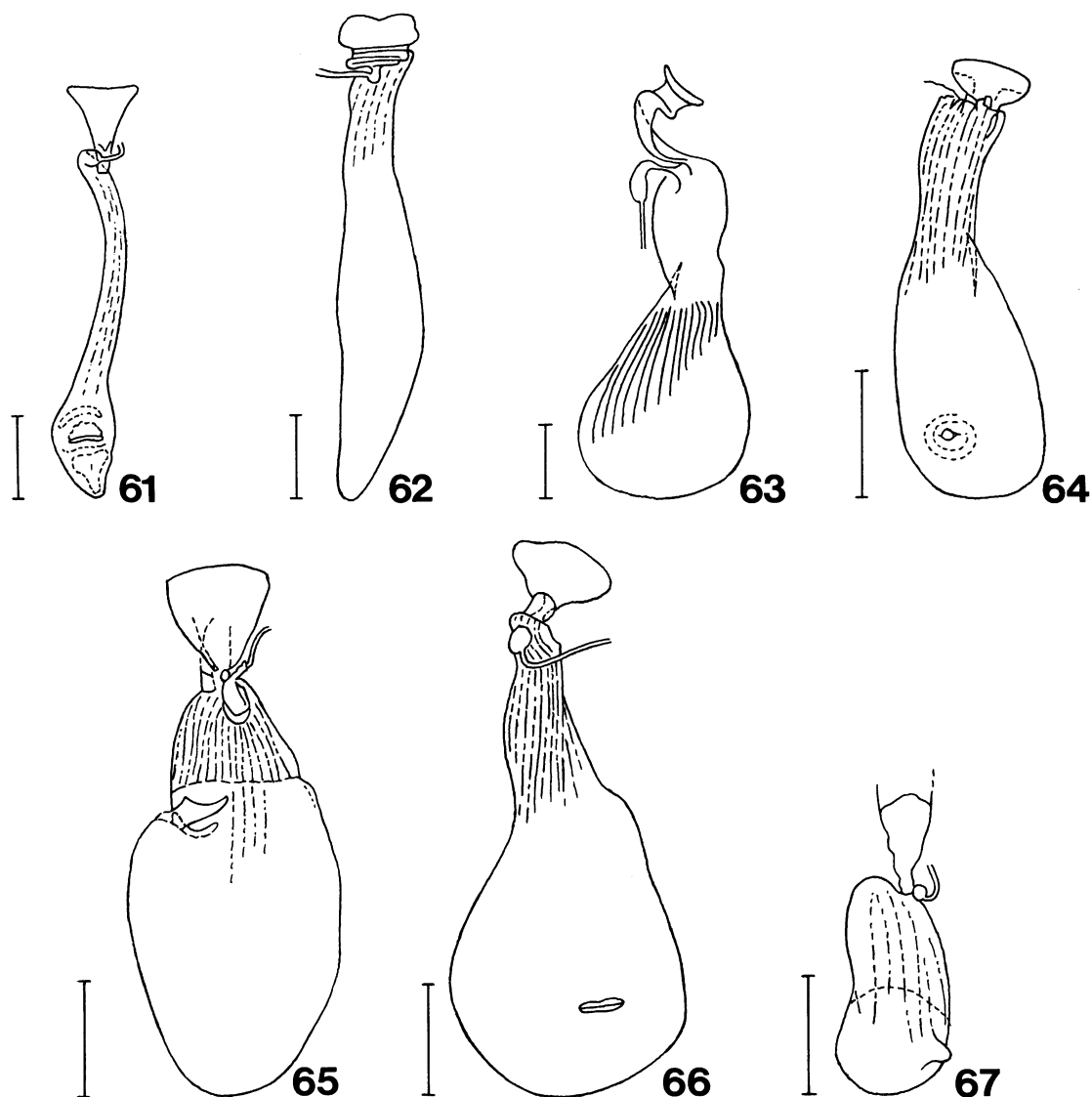
DIAGNOSIS: The moths of this genus may be recognized by the lamellate antennae of the males, the large size, with the forewing length from 16 to 20 mm, and by the upper surface of the forewings of the males, which is noticeably more contrastingly colored than that of the females. The male genitalia are characterized by the long slender processes of the anellus, with elongate apical setae that are almost as long as the processes themselves, by the slender valves having a setose costal ridge, and by the vesica having a single, slightly curved row of short spines that is half the length of the aedeagus. The female genitalia have a semicircular sclerotized lamella antevaginalis and a very long and slender corpus bursae that does not have a signum.

ADULTS: Head with eyes of males large, wider than front, of females noticeably smaller, narrower than front; front flat, barely extending beyond eyes, tightly scaled, without ventral tuft; palpi of males with second segment 0.6 mm long, third segment 0.4 mm, extending distance equal to length of eyes in front of eyes, females with larger palpi, second segment 0.8 mm, third segment 0.5 mm

in length, also extending distance equal to length of eyes in front of eyes; antennae of approximately 64 to 66 segments, lamellate in males, each lamella subrectangular with finely dentate margins, terminal six segments simple, of females simple. Thorax slender; foretibia of males with epiphysis arising about three-fifths length of segment and being nearly two-fifths its length, females arising at seven-tenths length and being three-tenths length of segment; hind tibia of males with small hair pencil. Abdomen relatively slender, extending to about hind margin of hind wings in both sexes; males without row of setae on ventral surface of third segment.

Forewings broad, apex pointed, outer margin curved, strongly dentate; with one accessory cell; vein R_1 to Sc, R_2 from top of cell, R_{3+4} from end of cell, stalked, R_5 from bottom of cell; mdc and ldc biconvex. Hind wings broad, outer margin strongly dentate, evenly rounded; Sc paralleling R for half length of cell; m and ldc angled.

Upper surface of forewings of males gray, more or less heavily suffused with brown, basal and inner portion of subterminal area dark brown, of females with very little brown scaling; maculation of males more prominent than that of females due to dark brown areas; t. a. line outwardly curved, dentate; median area with small black discal spot basad of median shade line, latter strongly curved or angled around discal spot, then subparalleling t. p. line to inner margin; t. p. line broadly curved in upper portion of wing, concave medially, convex above inner margin, dentate for entire length; s. t. line represented by two or three white spots below apex and white dash above inner angle, and by change of color in middle of wing; terminal line black, narrow; fringe concolorous with wing. Hind wings grayish white, with variable number of grayish black scales, and with anteroventral portion slightly darker; discal dot small; extradiscal line represented by single or double venular spots; terminal line obsolescent to slender, black when present; fringe brown. Under surface of all wings reddish brown, darker in males than in females, hind wings with more gray scaling than on forewings; maculation of all wings similar to that of upper surface but tending to be narrower or more weakly represented.



FIGS. 61–67. Female genitalia. 61. *Thallopaga taylorata* (Hulst), Dayton, Oregon, February 20, 1958 (R. Albright). 62. *Yalpa dalcahue*, new species, allotype, Dalcahue, Chile, February 1971 (G. Barria). 63. *Odontothera valdiviata* (Felder and Rogenhofer), Los Cipreces, Chile, January 14, 1968 (L. E. Peña). 64. *Psilaspilates signistriaria* Butler, Jardin Botanico, Chile, March 13–14, 1964 (L. E. Peña). 65. *Callemo monotonos*, new species, allotype, Contulmo, Chile, February 1, 1953 (L. E. Peña). 66. *Martindoelloia juradoi* Orfila and Schajovskoy, El Chinque, Chile, January 20–25, 1980 (L. E. Peña). 67. *Guara raphis*, new species, allotype, La Cabaña, Chile, March 27, 1955 (L. E. Peña). All AMNH; bar equals 1 mm.

Length of Forewings: Males, 16 to 19 mm; females, 17 to 20 mm.

MALE GENITALIA: Uncus curved, 1.0 mm long, with base 0.5 to 0.6 mm wide, simple, sides parallel, laterally and dorsally with very

thin setae, apex pointed; socius shortly digitate, with from 30 to 40 setae on each one; gnathos V-shaped, sides broad posteriorly, narrowed anteriorly, apical region bluntly rounded, having posteroventral surface with

numerous short spines; valves simple, extending posteriorly to near middle of uncus, costa slightly widened medially; transtilla with each side triangular, anterior point shortly projecting, with small point of attachment on midline; processes of anellus extremely long, extending to base of uncus, 2.0 mm in length, curved basally, then straight, with parallel sides, divergent, medially with or without a few spines, apically rounded, apical region with from 12 to 20 very long, straight, slender setae, their length only slightly shorter than basal portion; anellus deeply recessed dorsally; cristae very slender, long, 1.0 mm in length, arising from vertical sides of anellus, approximately 20 on each side; tegumen with median fusion more than half length of median area; saccus 1.5 times as long as tegumen, slightly tapered, anterior margin bluntly rounded or weakly concave; aedeagus 2.3 to 2.4 mm long, 0.3 mm wide, straight, lightly sclerotized posterior end pointed; vesica with single bicurved row of short, diagonal spines occupying half length of aedeagus, 30 to 40 spines present, longest ones 0.1 mm in length; vesica, when exerted, extending at about right angle to aedeagus, with curved row of spines present on basal half.

FEMALE GENITALIA: Sterigma with lamella antevaginalis a simple, collarlike, sclerotized band extending width of abdomen, lamella postvaginalis membranous, with transverse striations; ductus bursae sclerotized, quadrate, twice as wide as long; ductus seminalis arising from small ventral sac at posterior end of corpus bursae; corpus bursae very long and slender, 3.5 times length of apophyses posteriores, membranous except for small area posteriorly on left side next to ductus bursae and for granular dorsal surface posteriorly, distal end with weak longitudinal striations, of about same width for entire length except for slightly swollen anterior end; signum absent. Papillae anales moderate to elongate, with anterior attachment for apophyses; apophyses posteriores 1.4 mm long, apophyses anteriores 0.25 mm in length.

TYPE SPECIES: *Calta lamella*, new species.

DISTRIBUTION: Chile and adjacent Argentina.

FLIGHT PERIOD: January, February, March, and April.

REMARKS: Only the type species is included

in the genus. This species may be recognized by the lamellate male antennae, an autapomorphic character.

ETYMOLOGY: The generic name is an arbitrary combination of letters; the gender is feminine.

***Calta lamella*, new species**

Figures 20, 48, 73

DIAGNOSIS: As given for the genus.

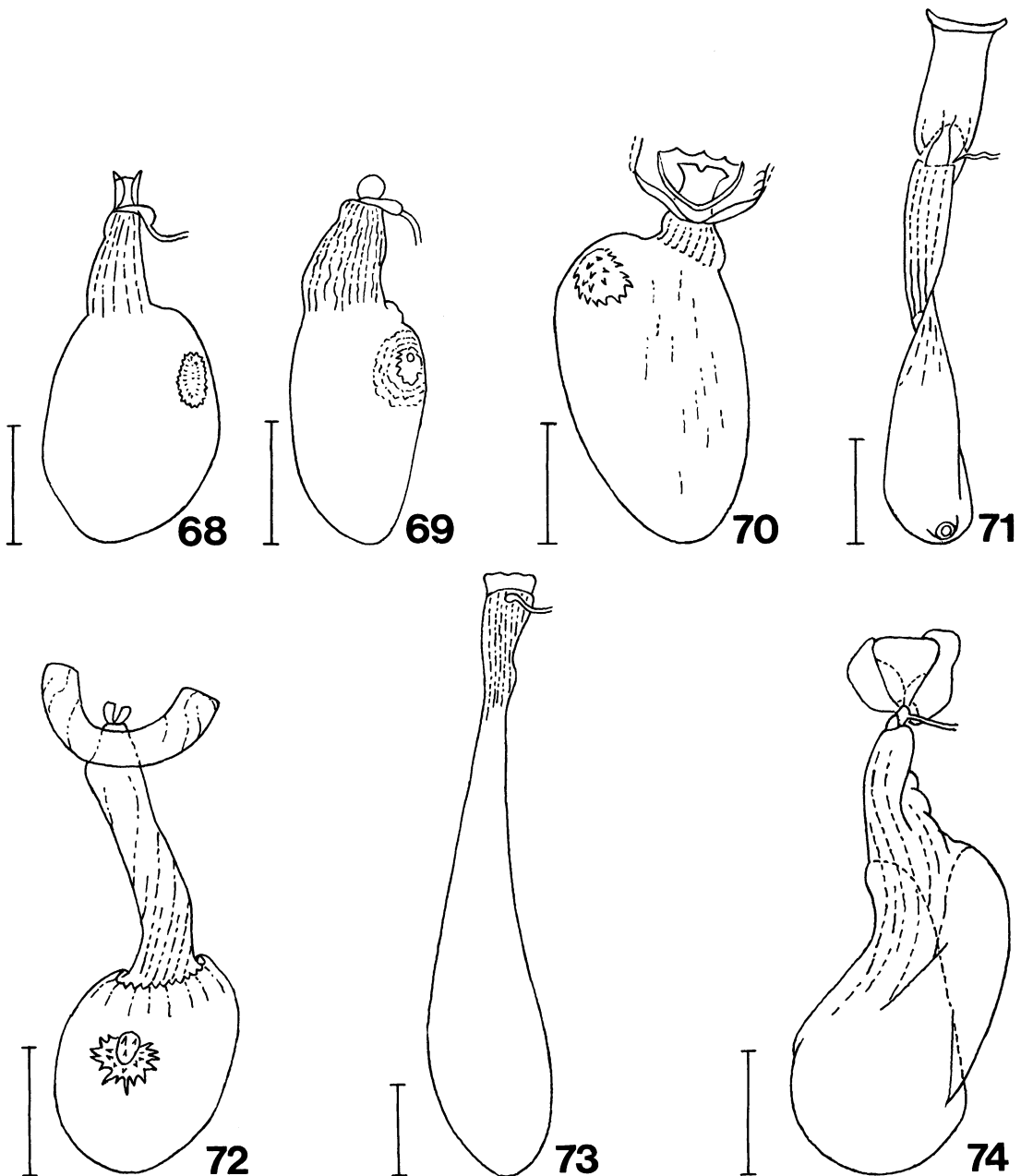
ADULTS: As described for the genus.

Length of Forewings: Holotype, 19 mm; allotype, 20 mm; male paratypes, 16 to 19 mm, female paratypes, 17 to 20 mm.

MALE GENITALIA: As described for the genus.

FEMALE GENITALIA: As described for the genus.

TYPES: Holotype, male, La Picada, 600 m, N of Petrohue, Llanquihue, Chile, January 13–22, 1980 (L. E. Peña); allotype, female, Lago Toro, 700 m, near Puyehue, Osorno, Chile, February 7–8, 1978 (L. E. Peña). The genitalia of the holotype are mounted on slide FHR 19,134A, with one antenna and set of legs on FHR 19,134B; the genitalia of the allotype are on slide FHR 19,211A, with one antenna and set of legs on FHR 19,211B. Paratypes, all from Chile, and collected by L. E. Peña: same data as holotype, 11 males; Llancahue, S of Valdivia City, Valdivia, April 1964, one female; Puerto Fuy, W of Pirehuelco Lake, Valdivia, February 16–30, 1978, two males; Enco, 200 m, E of Lago Riñihue, Valdivia, February 24–26, 1978, one male; Pucatrihue, coastal Osorno, January 21–23, 24–31, 1966, February 1–10, 1967, January 26–31, 1980, February 1–12, 1980, 12 males; Anticura, 350 m, near Puyehue, Osorno, February 1–4, 1978, six males, one female; Anticura, E of Puyehue on Río Golgol, Osorno, March 7, 1984, two males; Anticura to Aguas Calientes, near Puyehue, Osorno, February 1–8, 1978, 10 males; Aguas Calientes, Puyehue National Park, Osorno, February 10–22, 1979, 12 males, 2 females; Lago Toro, 700 m, near Puyehue, Osorno, February 7–8, 1978, one female; Dalcahue, E coast Chiloé Island, Chiloé, January 17–31, 1962, February 1971, 12 males; Dalcahue, NE of Castro, February 1, 1981, three males; Tepuhueco, SW of Chonchi, Chiloé, March 3, 1984, one male.



FIGS. 68–74. Female genitalia. 68. *Siopla derance*, new species, allotype, La Invernada, Chile, December 1973 (L. E. Peña). 69. *Nucara recurva*, new species, paratype, El Coigo, Chile, September 1959 (L. E. Peña). 70. *Lacaria orfilai*, new species, allotype, Lake Nonthue, Argentina, October 27, 1952 (S. Schajovskoy) (this dissection is from a paratype of *Casbia schajovskoyi* Sperry). 71. *Franciscoia morenoi* Orfila and Schajovskoy, Alto de Vilches, Chile, October 17–24, 1964 (L. E. Peña). 72. *Acauro rotundus*, new species, allotype, Aguas Calientes, Chile, December 12–17, 1981 (L. E. Peña). 73. *Calta lamella*, new species, allotype, Lago Torno, Chile, February 7–8, 1978 (L. E. Peña). 74. *Huechulafquenina formosa* Orfila and Schajovskoy, San Carlos de Bariloche, Argentina, February 3, 1958 (J. Foerster). All AMNH; bar equals 1 mm.

The holotype, allotype, and paratypes are in the collection of the AMNH.

DISTRIBUTION: Chile (Chiloé, Llanquihue, Osorno, and Valdivia) and Argentina (Neuquen; the two specimens before me from this area are not included in the type series). Many of the specimens in the type series are from the central valley or coastal mountains of Chile, at elevations of 200 to 700 m.

FLIGHT PERIOD: January, February, March, and April.

REMARKS: Eighty specimens (73 males, 7 females), three male and two female genitalic dissections, and two male and one female slide mounts of antennae and legs have been studied.

At a quick, first glance the adults of this species look similar to those of *Acauro rotundus*; however, the members of the present species are larger and more brightly colored, especially the males. There is some dimorphism in color, as the females are paler and less brown than the males. The sole included species is easily recognized by the male antennae, and the male and female genitalia, as outlined in the tables, keys, and Diagnosis.

ETYMOLOGY: The specific name is from the Latin *lamellus*, the diminutive of *lamina*, plate or platelike, in reference to the lamellate male antennae.

GENUS *HUECHULAFQUENIA*

ORFILA AND SCHAJOVSKOY

Figures 21, 74

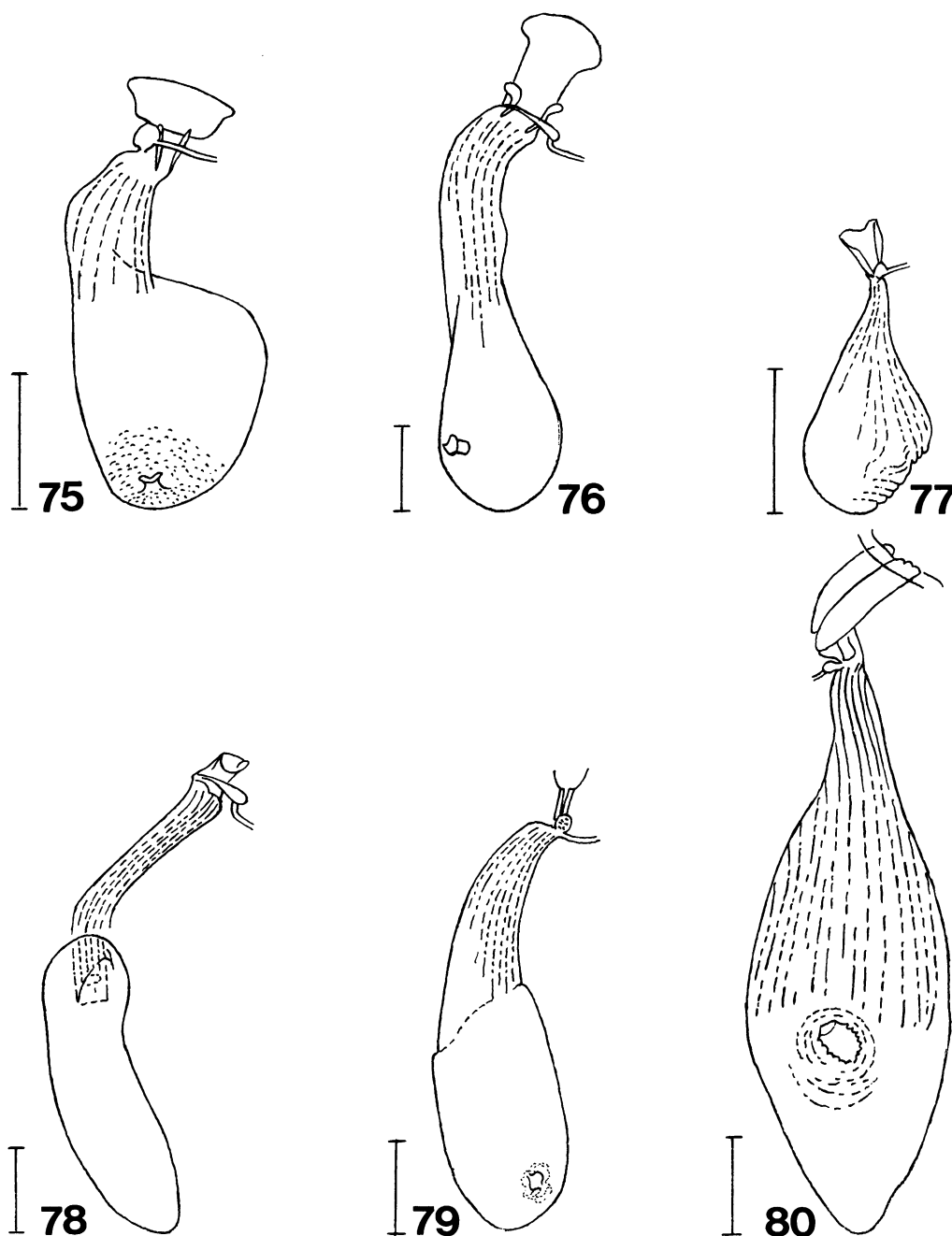
Huechulafquenia Orfila and Schajovskoy, 1964, p. 26.

DIAGNOSIS: The moths of this genus may be recognized by the swollen front having a ventral tuft, by the palpi of the females extending beyond the eyes 1.5 times the diameter of the eyes, and by the deeply scalloped outer margin of all wings. The male genitalia have the processes of the anellus evenly curved and tapering, and the vesica has about six long spines. The female genitalia have a short ductus bursae, and the large, asymmetrical corpus bursae has a curved, longitudinally striate, sclerotized posterior portion leading into a large, smoothly sclerotized dorsal area, with the ventral portion being membranous, and no signum is present.

ADULTS: Head with eyes of females narrower than front (no males have been examined); front rounded, extending beyond eyes one-fourth diameter of eyes, long scaled, with ventral tuft; palpi of females with second segment 1.0 mm long, third segment 0.3 mm, extending 1.5 times length of eyes in front of eyes; antennae with approximately 54 segments, simple in females. Thorax slender; foretibia of females with epiphysis arising at three-fifths length of segment and being two-fifths its length. Abdomen relatively slender, extending to about hind margin of hind wings.

Forewings triangular, costa straight except for slight curve at base, outer margin deeply scalloped, projecting at veins M_2 and M_3 ; either without accessory cell or with one formed by very short cross vein; vein R_1 free, R_2 either free or from end of cell (when present), R_{3+4} stalked, from end of cell (when present), R_5 from R_{3+4} or end of cell (when present); mdc and ldc angled or weakly bi-convex. Hind wings broadly triangular, outer margin scalloped, with longest projection at vein Cu_1 ; Sc paralleling R for half or slightly more than length of cell; m and ldc angled or rounded.

Upper surface of females orange-brown or reddish brown, with median area either concolorous with remainder of wing or white, traversed by brown veins and having vaguely reticulate pattern; t. a. line shortly angulate at costa, then straight to inner margin; median shade line not as prominent as adjacent lines, angled at costa, then straight or slightly curved to inner margin; t. p. line sharply angulate at costa, with small white spot at origin, then more or less straight, with variable amount of distal shading; subterminal area uniformly colored except for some pale scaling below costa; terminal line varying from being absent to brown; fringe white, broadly divided by brown at ends of veins. Hind wings whitish, with variable number of brown and gray scales, darkest around anal angle and in subterminal area; faint median and complete extradiscal lines present; terminal line brown or grayish brown; fringe similar to that of forewings. Under surface grayish brown, forewings with apical area broadly brown or reddish brown, hind wings with broad, brown subterminal area; maculation of upper sur-



FIGS. 75–80. Female genitalia. 75. *Euclidiodes ophiusina* (Butler), Lake Nonthue, Argentina, December 20, 1952 (S. Schajovskoy). 76. *Yapoma chone*, new species, allotype, nr. Puyehue, Chile, February 1–8, 1978 (L. E. Peña). 77. *Duraglia xanthe*, new species, allotype, Las Trancas, Chile, February 1978 (L. E. Peña). 78. *Laneco suffuscus*, new species, allotype, Pucatrihue, Chile, January 1971 (L. E. Peña). 79. *Incalvertia fumipennis* (Warren), Dalcahue, Chile, January 17–31, 1962 (L. E. Peña). 80. *Catophoenissa dibapha vesca* Rindge, allotype, El Bolson, Argentina, 1961 (A. Kovacs). All AMNH; bar equals 1 mm.

face repeated, but without contrasting median area of forewings.

Length of Forewings: Females, 14 to 17 mm.

MALE GENITALIA: Not examined; the following notes are based on the original description and drawing (Orfila and Schajovskoy, 1964, fig. 6): Uncus curved, with base about half as wide as length of uncus, shaft weakly constricted medially, apex pointed; socius shortly digitate; gnathos V-shaped, sides slightly narrowing anteriorly, apical region pointed and covered with numerous short spines; valves simple, transtilla with each side subtriangular, with very slender median point of attachment; processes of anellus extending to middle of gnathos, evenly curved, tapering from relatively broad base to apical point, bare; anellus subrectangular; cristae extending to middle of processes of anellus; tegumen broad, subquadrate, with short median fusion; saccus about 1.5 times as long as tegumen, slightly tapered, anterior margin weakly concave; aedeagus curved, posterior end pointed; vesica with group of six elongate setae, length about two-thirds length of aedeagus.

FEMALE GENITALIA: Sterigma with lightly sclerotized transverse lamella antevaginalis, attached anteriorly to sclerotized, punctate ventral portion of last abdominal segment, lamella extending width of abdomen, slightly constricted medially, lamella postvaginalis weakly defined, lightly sclerotized, quadrate, with transverse striations; ductus bursae large, posteriorly a pair of ovate lobes equal in width to width of abdomen, each having single, longitudinal, sclerotized barlike process, anteriorly more heavily sclerotized, tapering, with anteromedian membranous area; ductus seminalis arising from ventral transverse sac at posterior end of corpus bursae; corpus bursae asymmetrical, posteriorly and dorsally sclerotized, distal end narrow, with longitudinal striations, anterior portion curved dorsally to meet dorsal sclerotized area, antero-ventrally membranous, anterior end rounded, entire structure 3.5 to 4.0 times as long as apophyses posteriores; signum absent. Papillae anales elongate, posteriorly rounded, with anterior attachment for apophyses; apophyses posteriores 1.0 to 1.2 mm long, apophyses anteriores 0.3 to 0.5 mm.

TYPE SPECIES: *Huechulafquenina formosa* Orfila and Schajovskoy, 1964, p. 28, figs. 4 (head), 5 (venation), 6, 7 (male, female genitalia), pl. [1], figs. 4, 5 (adults).

DISTRIBUTION: Argentina (Neuquen, Río Negro) and Chile (Talca and Valdivia).

FLIGHT PERIOD: August, October, December, January, and February.

REMARKS: Only the type species is included in this genus. I have five female specimens before me (in AMNH), three of which are from Neuquen, Argentina and the other two from Chile. As far as I can tell, these specimens are conspecific, but males are needed from both countries before I can be certain of the identification.

In their Diagnosis for *Huechulafquenina*, Orfila and Schajovskoy state that this genus is closely related to *Martindoelloia* Orfila and Schajovskoy, and differs from the latter by the scalloped margin of the forewings and by the venation of the hind wings. While the first character is diagnostic for the present genus, the second is probably of little or no value; I have stated my opinion of venational characters under Remarks for *Franciscoia* (above). There are a number of apomorphic characters for this genus; they are given in the tables, and additional means of recognizing *Huechulafquenina* are presented in the keys and Diagnosis.

GENUS *EUCLIDIODES* WARREN

Figures 22, 23, 49, 75

Euclidiodes Warren, 1895, p. 141. Orfila and Schajovskoy, "1959" [1960], p. 8.

Catrielia Orfila and Schajovskoy, "1959" [1960], p. 12. New synonymy.

DIAGNOSIS: The species of this genus may be recognized by the presence of long scales on the front and dorsal surface of the thorax, and by the generally long palpi. The male genitalia have a long, slender C-shaped uncus, a W-shaped gnathos with the prominent median area recurved and spined, and the slightly curved processes of the anellus are weakly setose. The female genitalia have a median attachment of the apophyses posteriores to the papillae anales, a short ductus bursae, and an elongate, asymmetrical corpus bursae with a prominent, invaginated, rayed signum.

ADULTS: Head with eyes of males not as wide as width of front, of females slightly smaller than those of males; front flat, barely extending beyond eyes, tightly scaled with long scales, without ventral tuft; palpi of males with second segment 0.6 to 0.9 mm long, third segment 0.3 to 0.5 mm, extending from 0.5 to 1.5 times length of eyes in front of eyes in males, 0.75 to 1.66 times the diameter in females; antennae with approximately 43 to 62 segments, simple in both sexes. Thorax slender with long scales dorsally; foretibia of males with epiphysis arising between three-fifths and two-thirds length of segment and being from one-third to between two-fifths and one-half its length, of females arising between three-fifths and two-thirds length and being from one-third to two-fifths length of segment; hind tibia of males with or without hair pencil. Abdomen slender and extending slightly beyond hind margin of hind wings (males) or relatively thick and barely reaching hind margin (females); males with row of setae on ventral surface of third segment.

Forewings broad, apex pointed, outer margin rounded, smooth; without accessory cell; veins R_1 and R_2 free, R_{3+4} stalked, R_5 from R_{3+4} ; mdc and ldc biconvex. Hind wings broad, outer margin rounded, smooth; Sc paralleling R for one-half to three-fifths length of cell; m and ldc angled or rounded.

Upper surface of forewings grayish white to pale brown, with contrasting dark brown or blackish brown maculation; maculation variable, either with t. a. and median lines joining near inner margin and having triangular included area dark brown, or with t. a. and median lines indicated by dark spots on costa and having prominent, outwardly oblique line extending from inner margin to cubital vein, or with both t. a. and median lines obsolescent; t. p. line either prominent on costa, sharply curved outwardly, then becoming obsolescent posteriorly, or represented as series of dark venular dots extending across wing; subterminal area unicolorous with wing or with dark scaling; terminal line of dark intravenular spots; fringe concolorous with wing. Hind wings slightly paler than forewings, with variable number of gray and brown scales; without maculation except for obsolescent discal dot and faint trace of extradiscal line; terminal line absent or obso-

lescent; fringe concolorous with wing. Under surface gray, grayish brown, or pale brown, with hind wings tending to be slightly paler than forewings; maculation obsolescent.

Length of Forewings: Males, 13 to 18 mm; females, 13 to 19 mm.

MALE GENITALIA: Uncus curved, C-shaped, with base 0.5 to 0.6 mm wide, simple, slender, dorsally with a few very thin setae, apex pointed; socius shortly digitate, with from about 8 to 12 setae on each one; gnathos W-shaped, sides broad, lightly sclerotized, apical region more heavily sclerotized, narrowed, curved ventrally, spinose, terminating in single longer spine; valves simple, extending posteriorly to near middle of uncus; transtilla narrow, each side with anteromedian angle, posterior margin rounded, with small point of attachment on midline; processes of anellus slender, curved, tapering to point, surface weakly setose, 0.45 to 0.70 mm long; anellus recessed dorsally, with or without membranous median portion; cristae not prominent, arising from vertical sides of anellus, with from about 3 to 20 on each side, 0.3 to 0.6 mm long; tegumen with short median fusion; saccus subequal in length to tegumen, sides tapered, anterior margin concave medially; aedeagus 1.5 to 1.9 mm long, 0.20 to 0.25 mm wide, slightly curved, posterior end sclerotized, attenuate, pointed; vesica variably spinose, with either single cluster of thin spines, single cluster of thin spines plus one thick distal spine, or latter grouping plus one to three very long slender spines.

FEMALE GENITALIA: Sterigma with lamellae not distinguishable but with a few transverse striations medially, with large to medium size, membranous or lightly sclerotized ostium bursae; ductus bursae small, lateral margins appearing more heavily sclerotized than median area, with length equal to width or about twice as long as wide; ductus seminalis from small ventral sac at posterior end of corpus bursae; corpus bursae symmetrical or asymmetrical, posterior portion straight or curved, parallel-sided or increasing in width anteriorly, completely or partially sclerotized, with variable number of longitudinal striations, anterior portion membranous, ovate or round, entire structure two to three times length of apophyses posteriores; signum large, prominent, set in granular area, invaginated,

rounded or with anterior part enlarged, margin variously rayed. Papillae anales elongate, with anteromedian attachment for apophyses; apophyses posteriores 1.00 to 1.35 mm long, apophyses anteriores 0.4 to 0.6 mm.

TYPE SPECIES: For *Euclidiodes*, *Heterophleps ophiusina* Butler; by original designation. For *Catrielia*, *Heterophleps agitata* Butler; by original designation.

DISTRIBUTION: Central and southern Chile, and adjacent Argentina.

FLIGHT PERIOD: October, December into May.

REMARKS: Five species are included in this genus. This is one of four genera in the South American Lithinini that has a W-shaped gnathos; its members can be recognized by the apomorphic characters given in the tables, and by the keys and Diagnosis.

My identification of *Euclidiodes ophiusina* (Butler) is based on material from the Sperry collection (now in the AMNH) that was determined by Fletcher at the BM; this is in agreement with the usage by Orfila and Schajovskoy ("1959" [1960], p. 11, figs. 1 [venation], 2, 3 [male, female genitalia], pl. 1, fig. 6 [adults]). *Catrielia agitata* (Butler) is determined from the generic and specific descriptions, plus illustrations, by Orfila and Schajovskoy (op. cit., pp. 12, 15, figs. 4 [venation], 5, 6 [male, female genitalia], pl. 1, fig. 3 [adults]). The authors of *Catrielia* state in their Diagnosis for their genus that it is related to *Euclidiodes* but differs by the erect palpi, distinct venation, and the genitalia. A study of 56 specimens (35 males, 21 females) in the AMNH from both Argentina (Neuquen, Río Negro) and Chile (Arauco, Coquimbo, Curico, Malleco, Santiago, Valparaíso), four genitalic preparations (two males, two females), and one slide mount of the antennae and legs of each sex proves to my satisfaction that the characters given by Orfila and Schajovskoy are of specific value only. Accordingly, as a result of my analysis, *Catrielia* is placed as a synonym of *Euclidiodes*. It should be pointed out that Orfila and Schajovskoy, in both their key to the genera and in the description of *Euclidiodes*, state that there is no areole in that genus, but in their figures of the venation, one accessory cell is indicated (op. cit., pp. 8, 9, fig. 1). While it is quite possible that an occasional specimen

of *Euclidiodes* will have an accessory cell, the majority of the moths do not possess one.

YAPOMA, NEW GENUS

Figures 24, 50, 76

DIAGNOSIS: The moths of this genus may be recognized by the short palpi projecting one-third (males) to two-thirds (females) length of eyes in front of eyes, and by the upper surface of the wings being blackish brown with pale grayish green maculation. The male genitalia have a long, slender uncus, a slender W-shaped gnathos, long, slender processes of the anellus which are equal in length to the uncus, and a vesica with from six to eight slender setae. The female genitalia have an elongate funnel-shaped ostium bursae and a long, slender, curved corpus bursae with a small invaginated signum.

ADULTS: Head with eyes of males wider than width of front, of females narrower than front; front flat, barely extending beyond eyes, tightly scaled, without ventral tuft; palpi of males with second segment 0.4 mm long, third segment 0.3 mm, extending one-third length of eyes in front of eyes in males, two-thirds length in females; antennae with approximately 55 segments, simple in both sexes. Thorax slender; foretibia of males with epiphysis arising at three-fifths length of segment, of females almost two-thirds length, being slightly more than two-fifths its length in both sexes; hind tibia of males with hair pencil. Abdomen slender, extending to about hind margin of hind wings in both sexes, in males tending to be slightly thinner and longer than in females; males with row of setae on ventral surface of third segment.

Forewings broad, costa slightly convex, outer margin evenly curved, smooth; without accessory cell; veins R_1 and R_2 free, R_{3+4} stalked, R_5 from R_{3+4} ; mdc and ldc biconvex. Hind wings broad, outer margin rounded, smooth; Sc paralleling R for three-fifths length of cell; m and ldc angled.

Upper surface of forewings blackish brown, with pale grayish green maculation; t. a. line white, complete, weakly biangulate; median area with basal portion blackish brown, outer margin defined by trilobed median line, distal portion of median area pale grayish green,

including prominent black discal spot; t. p. line white, outwardly angled from costa, subparalleling outer margin, dentate, crossing distal extension of median area in middle of wing; s. t. line white or pale grayish green at costa, becoming grayish green medially, irregular in course, blackish brown distad of line, with black cellular spots along outer margin narrowly edged with white; terminal line absent; fringe concolorous with wing. Hind wings grayish black, without maculation except for obsolescent discal dot; terminal line obsolescent; fringe white, grayish brown opposite vein endings. Under surface of forewings dark grayish brown, with paler scaling along costa, dark discal spot, and obsolescent t. p. line; hind wings paler than forewings, heavily scaled with brown, with discal spot and extradiscal line; terminal lines absent; fringes concolorous with wings.

Length of Forewings: Males, 13 to 15 mm; females, 13 to 16 mm.

MALE GENITALIA: Uncus broadly curved, with base 0.55 mm wide, slender, simple, dorsal surface with long, very slender setae, apex pointed; socius shortly digitate, with about 20 setae on each one; gnathos W-shaped, rodlike, sclerotized, posterolateral and posteromedian portions broad, very weakly sclerotized, median section with dentate ventral margin and apex; valves simple, elongate, extending to two-thirds length of uncus, slightly curved posteriorly, with area of thicker setae near end of costa; transtilla with each lateral piece having anterior point, posterior margin thickened, rounded, with small point of attachment on midline; processes of anellus slender, very long, 1.0 mm, extending to middle of gnathos, surface bare, tapering to sharp point; anellus recessed dorsally, each side smoothly sclerotized, median area finely punctate; cristae prominent, very long, 1.5 mm, extending posteriorly to beyond base of uncus, with about 20 setae arising from each ventral surface of anellus; tegumen with outer margins subparallel, dorsomedially X-shaped; saccus slightly longer than tegumen and wider posteriorly, sides tapering anteriorly, anterior margin concave; aedeagus 2.3 to 2.4 mm long, 0.25 mm wide, curved, posterior end lightly sclerotized, attenuate, forming elongate point; vesica with median group of from six to eight

spines of varying lengths, longest 0.5 to 0.6 mm, with spines occupying about one-third length of aedeagus.

FEMALE GENITALIA: Sterigma with lamellae not developed, with large, lightly sclerotized, funnel-shaped ostium bursae constricted medially; ductus bursae with lateral areas appearing more sclerotized than middle, posterior portion broadly flared outwardly, anterior portion with subparallel sides, joining corpus bursae ventrally; ductus seminalis arising from transverse sac beyond right margin of corpus bursae; corpus bursae asymmetrical, posterior portion curved, lightly sclerotized, with longitudinal striations, anterior portion membranous, slightly widened, ovate, entire structure four to five times longer than apophyses posteriores; signum small, round, indented into corpus, variable in shape and in number and size of rays, set in granular area. Papillae anales relatively short and broad, with median point of attachment for apophyses; apophyses posteriores 0.7 mm long, apophyses anteriores 0.4 to 0.5 mm.

TYPE SPECIES: *Yapoma chone*, new species.

DISTRIBUTION: Chile and adjacent Argentina.

FLIGHT PERIOD: December, January, and February.

REMARKS: Only the type species is included in the genus. This genus may be distinguished from the other genera that have a W-shaped gnathos by the combination of apomorphic characters given in the tables, and from all other genera by the keys and Diagnosis.

ETYMOLOGY: The generic name is an arbitrary combination of letters; the gender is feminine.

Yapoma chone, new species

Figures 24, 50, 76

DIAGNOSIS: As given for the genus.

ADULTS: As described for the genus.

Length of Forewings: Holotype, 14 mm; allotype, 15 mm; male paratypes, 13 to 15 mm, female paratypes, 13 to 16 mm.

MALE GENITALIA: As described for the genus.

FEMALE GENITALIA: As described for the genus.

TYPES: Holotype, male, Dalcahue, E coast Chiloé Island, Chiloé, Chile, January 17–31,

1962 (L. E. Peña); allotype, female, Anticura to Aguas Calientes, near Puyehue, Osorno, Chile, February 1–8, 1978 (L. E. Peña). The genitalia of the holotype are mounted on slide FHR 13,202, and those of the allotype on slide FHR 19,217A, with one antenna and set of legs on FHR 19,217B. Paratypes, all from Chile, and collected by L. E. Peña: Río Carihueco, mountains of Chiloé Island, NW of Castro, Chiloé, February 18–25, 1957, 10 males; Pto. [Puerto] Cisnes, coast, Ayseén forest region [Aisen], February 1961, two males; Río Blanco, Curacautin, Andes, Malleco, February 1964, one female; E Cord[illera], Las Raíces, Malleco, December 24–26, 1976, one female; Pichinahuel, Cord[illera] Nahuelnuta, coast range, Arauco, February 1963, one female; Lago Toro, 700 m, near Puyehue, Osorno, February 7–8, 1978, two females; Aguas Calientes, near Puyehue, February 6–7, 1978, one female; Aguas Calientes, Puyehue National Park, Osorno, February 10–12, 1979, one female.

The holotype, allotype, and paratypes are in the collection of the AMNH.

DISTRIBUTION: Chile (Aisen, Arauco, Chiloé, Malleco, Osorno) and Argentina (Neuquen; the single female before me from this area is not included in the type series).

FLIGHT PERIOD: December, January, and February.

REMARKS: Twenty-two specimens (13 males, 9 females), two male and three female genitalic dissections, and one male and one female slide mounts of antennae and legs have been studied.

The pattern of the forewings is somewhat similar to that of *Euclidiodes agitata* (Butler), but the colors of the present species are both brighter and darker. The generic characters will separate the two species without any difficulties.

ETYMOLOGY: The specific name is from the Greek *chone*, funnel, referring to the shape of the ostium bursae.

DURAGLIA, NEW GENUS

Figures 25, 51, 77

DIAGNOSIS: The moths of this genus may be recognized by the presence of some hair-like scales in the patagia, and by the upper surface of the forewings being unicolorous yellow with obsolescent maculation. The male

genitalia have an elongate, C-shaped, slender uncus, a broad, W-shaped, spinose gnathos, and very short (0.3 mm), broad, setose processes of the anellus. The female genitalia have an almost membranous, triangular ductus bursae, and an evenly tapered, broad corpus bursae with a vestigial signum.

ADULTS: Head with eyes of both sexes about equal in size, narrower than front; front flat, extending slightly beyond eyes, tightly scaled, without ventral tuft; palpi of males with second segment 0.7 mm long, third segment 0.3 mm, extending beyond eyes a distance equal to diameter of eyes, of females slightly longer; antennae with approximately 49 to 53 segments, simple in both sexes. Thorax slender; patagia with mixture of regular and hairlike scales; foretibia of males with epiphysis arising between three-fifths and two-thirds length of segment and being two-fifths or slightly longer in length (female not available); hind tibia of males with hair pencil. Abdomen slender, extending to about hind margin of wings in both sexes, in males slightly thinner and longer than in females; males without row of setae on ventral surface of third segment.

Forewings broad, costa weakly convex, outer margin minutely concave below apex, then rounded, smooth; without accessory cell; veins R_1 and R_2 free; R_{3+4} stalked, R_5 from R_{3+4} ; mdc and ldc curved. Hind wings broad, outer margin rounded, smooth; Sc paralleling R between one-half and three-fifths length of cell; m and ldc angled.

Upper surface of forewings unicolorous yellow, with greatly reduced maculation; t. a. line represented by dark brown costal dot and small spots on cubital and anal veins; discal dot obsolescent; t. p. line represented by prominent dark brown costal dot and small venular spots across wing; terminal area not differentiated; terminal line absent; fringe concolorous with wing. Hind wings cream-colored, with scattered grayish brown scales; maculation obsolescent, with faint traces of discal dot and broad extradiscal band present in some specimens; terminal line and fringe as on forewings. Under surface pale yellowish brown, forewings with area from base to t. p. line suffused with gray; discal dots, outer cross lines, and brown terminal line present on all wings; fringes yellow.

Length of Forewings: Males, 15 to 16 mm; females, 16 mm.

MALE GENITALIA: Uncus broadly curved, with base 0.5 mm wide, simple, slender, sides parallel, apex pointed; socius short, with 6 to 10 setae on each one; gnathos W-shaped, sides broad, flat, widening anteroventrally, median section with prominently dentate ventral margin and apex; valves simple, broadest medially, extending posteriorly to about middle of uncus, with small area of thicker setae near end of costa; transtilla with each lateral piece triangular, posterior margin rounded, with small point of attachment on midline; processes of anellus short, 0.3 mm long, broad, extending to middle of transtilla, posteriorly pointed, very weakly sclerotized, surfaces with elongate slender setae; anellus recessed dorsally, lightly sclerotized; cristae not prominent, about 0.4 mm long, with about 10 arising from each ventral surface of anellus; tegumen rounded, with median fusion about half length of tegumen on midline; sacculus subequal in length to tegumen, wider posteriorly, sides tapered, anterior margin rounded or concave; aedeagus 1.5 to 1.6 mm long, 0.25 mm wide, curved, posterior end lightly sclerotized, attenuate, forming elongate point; vesica with median group of about 10 to 12 deciduous spines of varying lengths, longest 0.6 mm, with spines occupying about one-third length of aedeagus.

FEMALE GENITALIA: Sterigma membranous, with a few transverse striations medially; ductus bursae with lateral areas appearing more heavily sclerotized than median area, tapered anteriorly, about twice as long as maximum width; ductus seminalis arising from ventral sac at posterior end of corpus bursae; corpus bursae evenly tapered posteriorly, broadly rounded anteriorly, membranous, with longitudinal striations posteriorly and wrinkled surface anteroventrally, entire structure only slightly longer than apophyses posteriores; signum vestigial, scarcely differentiated. Papillae anales poorly defined, with shallow longitudinal ridges, and anterior attachment for apophyses; apophyses posteriores 1.4 mm long, apophyses anteriores 0.7 mm.

TYPE SPECIES: *Duraglia xanthe*, new species.

DISTRIBUTION: Chile.

FLIGHT PERIOD: January and February.

REMARKS: Only the type species is included in the genus. As with the two preceding genera, the male genitalia of *Duraglia* have a W-shaped gnathos; the present genus can be recognized by the distinctive unicolorous yellow coloration of the upper surface of the forewings having obsolescent maculation.

ETYMOLOGY: The generic name is an arbitrary combination of letters; the gender is feminine.

***Duraglia xanthe*, new species**

Figures 25, 51, 77

DIAGNOSIS: As given for the genus.

ADULTS: As described for the genus.

Length of Forewings: Holotype, 16 mm; allotype, 16 mm; male paratypes, 15 to 16 mm.

MALE GENITALIA: As described for the genus.

FEMALE GENITALIA: As described for the genus.

TYPES: Holotype, male, Valdivia, Valdivia, Chile, February 22, 1959 (L. E. Peña); allotype, female, Las Trancas, 1200 m, Chillán area, SE of Recinto, Ñuble, Chile, February 1978 (L. E. Peña). The genitalia of the holotype are mounted on slide FHR 19,190, and those of the allotype on FHR 19,277. Paratypes, all from Chile, and collected by L. E. Peña: Termes Tolhuaca, Andes, Malleco, January 15–20, 1959, one male; Las Trancas, 1200 m, mountains in Chillán area, Ñuble, February 7–12, 1966, one female; Las Trancas, 1200 m, Chillán area, E of Recinto, Ñuble, February 1978, one female.

The holotype, allotype, and paratypes are in the collection of the AMNH.

DISTRIBUTION: Chile (Malleco, Ñuble, Valdivia).

FLIGHT PERIOD: January and February.

REMARKS: Five specimens (four males, one female), three male and one female genitalic dissections, and one slide mount of the male antenna and legs have been studied.

There does not seem to be much individual variation in the pattern of the upper surface of the wings when allowance is made for age and wear.

ETYMOLOGY: The specific name is from the Greek *xanthos*, yellow or golden, in reference

to the color of the upper surface of the forewings.

LANECO, NEW GENUS

Figures 26, 52, 78

DIAGNOSIS: The moths of this genus may be recognized by the elongate palpi, extending from 1.25 (males) to 1.50 (females) times diameter of eyes in front of eyes, and by the dark brown upper surface of the forewings having variable maculation. The male genitalia have an elongate, slender, curved, uncus, the processes of the anellus arise from a broadly triangular base, are curved basally and are relatively short, having the posterior end spinose, with the length of the spines equal to the length of the processes themselves, and the aedeagus is weakly S-shaped and has seven or eight elongate spines in the vesica. The female genitalia have a very long corpus bursae, the posterior portion being slender, sclerotized, and longitudinally striate, with a diagonal line of demarcation between it and the membranous anterior portion, the latter being without a signum.

ADULTS: Head with eyes of both sexes about equal in size, narrower than front; front flat, barely extending beyond eyes, tightly scaled, without ventral tuft; palpi very long, second segment of males 0.8 mm long, third segment 0.4 mm, extending beyond eyes a distance of 1.25 times diameter of eyes in males, in females 1.50 times; antennae with approximately 52 to 55 segments, simple in both sexes. Thorax moderately slender; foretibia of both sexes with epiphysis arising between three-fifths and two-thirds length of segment, and being slightly less than one-half in length in males and two-fifths in females; hind tibia of males with hair pencil. Abdomen moderately slender, extending to about hind margin of hind wings in both sexes, in males tending to be slightly thinner and longer than in females; males with row of setae on ventral surface of third segment.

Forewings broad, costa weakly convex, outer margin rounded, smooth; without accessory cell; veins R_1 and R_2 free, R_{3+4} stalked, R_5 from R_{3+4} ; mdc and ldc biconvex. Hind wings broad, outer margin rounded, smooth; Sc paralleling R between one-half and three-fifths length of cell; m and ldc curved.

Upper surface of forewings dark brown, with varying amount of pale scaling in basal area and in outer part of median area; t. a. line complete, curved or dentate; basal portion of median area dark brown, with very variable demarcation between it and pale distal area, latter containing black discal spot; t. p. line sharply curved outward from costa, forming pointed angle, then extending straight or slightly dentate to inner margin; dark brown spot on costa above outward curve of t. p. line; subterminal area variably colored, many specimens with blackish brown area in cells M_2 and M_3 ; outer margin with intravenular black spots in some specimens; terminal line absent; fringe concolorous with wing. Hind wings grayish brown to brown, paler than forewings; without maculation except for dull black discal spot; terminal line and fringe as on forewings. Under surface of forewings grayish brown, with some paler brown scaling, hind wings paler gray, with numerous dark brown scales; maculation of forewings with small discal dot and obsolescent t. p. line, of hind wings with prominent black spot and extradiscal line outwardly dentate on veins, varying from complete to absent; all wings with slender black terminal line, fringe concolorous with wings except for darkened areas at vein endings.

Length of Forewings: Males, 14 to 17 mm; females, 15 to 18 mm.

MALE GENITALIA: Uncus strongly curved, with base 0.5 mm wide, simple, slender, sides parallel, posterodorsally with a few short setae, apex pointed; socius shortly digitate, with from 10 to 15 setae on each one; gnathos V-shaped, sides flat, slightly increasing in width distally, apical portion prominent, with posterior dentate ridge, apex recurved, with thick terminal spine; valves simple, broad, extending posteriorly to middle of uncus, costa slightly widened distally, with area of slightly thickened setae near end of costa; transtilla with lateral tubular piece, median portion subrectangular, with small point of attachment at midline; processes of anellus with curved basal portion, distally subparallel, broad, short, apical end with numerous elongate setae, latter extending beyond transtilla, each structure 0.7 mm long; anellus sclerotized, deeply recessed dorsally on each side, median portion angled ventrally, ante-

riorly weakly punctate; cristae prominent, arising from ventral areas of anellus, 30 to 40 on each side, 1.0 mm in length, being slightly shorter than processes of anellus; tegumen with sides subparallel, dorsally X-shaped; saccus slightly longer than tegumen, wider posteriorly, sides tapering, anterior margin concave; aedeagus 2.1 to 2.8 mm long, 0.3 mm wide, slightly S-shaped, lateral margins and posterior end sclerotized, tapering to elongate point; vesica with median group of six to eight thick spines, longest being 0.5 to 0.7 mm, with group occupying about two-fifths length of aedeagus.

FEMALE GENITALIA: Sterigma with membranous lamella antevaginalis troughlike, ventrad of posterior end of ductus bursae, extending nearly entire width of abdomen, lamella postvaginalis having sclerotized slender rim forming inner lip of lamella antevaginalis, and with irregular median transverse striations; ductus bursae with lateral margins appearing more heavily sclerotized than median area, length about equal to width, slightly tapered anteriorly; ductus seminalis arising from transverse sac at posteroventral end of corpus bursae; corpus bursae elongate, three to five times longer than apophyses posteriores, posterior portion relatively slender, sclerotized, with numerous longitudinal striations, slightly S-shaped, diagonally expanded into larger membranous anterior portion, ventral part of latter extending farther posteriad than dorsal surface, elliptical in outline; signum absent. Papillae anales lightly sclerotized, slender in anterior-posterior direction, with anterior attachment for apophyses; apophyses posteriores 1.5 mm long, apophyses anteriores 0.3 to 0.4 mm.

TYPE SPECIES: *Laneco suffuscus*, new species.

DISTRIBUTION: Chile.

FLIGHT PERIOD: December and January.

REMARKS: Only the type species is included in the genus. This genus can be recognized by the large number of apomorphic characters in the adults and genitalia of both sexes, as outlined in the tables, as well as by the use of the keys and Diagnosis.

ETYMOLOGY: The generic name is an arbitrary combination of letters; the gender is masculine.

Laneco suffuscus, new species

Figures 26, 52, 78

DIAGNOSIS: As given for the genus.

ADULTS: As described for the genus.

Length of Forewings: Holotype, 16 mm; allotype, 18 mm; male paratypes, 14 to 17 mm, female paratypes, 15 to 18 mm.

MALE GENITALIA: As described for the genus.

FEMALE GENITALIA: As described for the genus.

TYPES: Holotype, male, Pucatrihue, coastal Osorno, January 24–31, 1966 (L. E. Peña); allotype, female, same data but January 1971. The genitalia of the holotype are mounted on slide FHR 15,607A, with one antenna and two legs on FHR 15,607B, and those of the allotype on slide FHR 19,225A, with one antenna and set of legs on FHR 19,225B. Paratypes, all from Chile, and collected by L. E. Peña: Aguas Calientes, 400 m, Puyehue, Osorno, December 12–17, 1981, one male, two females; El Chinque, 300 m, N of Corrientes, Llanquihue, January 20–25, 1980, one male, two females; La Picada, 600 m, N of Petrohue, Llanquihue, January 13–22, 1980, one female; Chacamo, 600 m, W of Temuco, Cautin, December 10, 1981, one male; Río Blanco, Malleco, January 20–25, 1974, one male; E Cord[illera], Las Raices, Malleco, December 18–21, 24–26, 1976, two males; Puntra, S of Ancud, Chiloé, December 19–29, 1981, three males, two females; Tepuhueco, SE of Cucao, Chiloé, December 23–26, 1981, one male, two females; Huequetrumo, 22 km N of Quellon, Chiloé, December 26–28, 1981, four males, one female.

The holotype, allotype, and paratypes are in the collection of the AMNH.

DISTRIBUTION: Chile (Cautin, Chiloé, Llanquihue, Malleco, Osorno).

FLIGHT PERIOD: December and January.

REMARKS: Twenty-six specimens (14 males, 12 females), three male and two female genital dissections, and two male and two female slide mounts of antennae and legs have been studied.

Most of the specimens have the upper surface of the wings rather worn and abraded so that it is not easy to give information on the amount of individual variation within this

species; the one thing that appears certain is that the females have more pale scaling in the outer portion of the median area than do the males.

ETYMOLOGY: The specific name is from the Latin *suffuscus*, brownish, in reference to the color of the upper surface of the forewings.

Incalvertia, replacement name
and new status

Figures 27, 53, 79

Calvertia Warren, 1908, p. 106, not *Calvertia* Bourguignat, 1880. Fletcher, 1979, p. 80 (listed as synonym of *Euclidiodes*). Rindge, 1983, p. 159.

DIAGNOSIS: The moths of this genus may be recognized by the upper surface of the forewings being dark brown with a slender, paler median area and by the orange scaling of the hind wings. The male genitalia have a very long, slender uncus, a W-shaped gnathos, a dense group of prominent cristae that covers the short, setose, membranous processes of the anellus, and a great number of spines in the vesica. The female genitalia have an elongate corpus bursae, which has a laterally flattened, sclerotized, and striate posterior portion, and a swollen membranous anterior portion with a small angulate signum.

ADULTS: Head with eyes of males large, wider than front, of females narrower than front; front flat, not extending beyond eyes, tightly scaled, without ventral tuft; palpi with second segment of both sexes 0.8 mm long, third segment 0.4 mm, extending beyond eyes three-fourths their diameter in both sexes; antennae of approximately 64 segments, simple in both sexes. Thorax moderately slender; foretibia of both sexes with epiphysis arising at three-fifths length of segment, and being two-fifths its length; hind tibia of males with hair pencil. Abdomen moderately slender, extending slightly beyond hind wings in males, shorter and thicker in females; males with row of setae on ventral surface of third segment.

Forewings broad, costa almost straight, with sharp apex, outer margin gently rounded, smooth; without accessory cell; veins R_1 and R_2 free, R_{3+4} stalked, R_5 from R_{3+4} ; mdc and ldc curved. Hind wings broad, outer mar-

gin rounded, weakly sinuate; Sc paralleling R for slightly more than half length of cell; m and ldc curved.

Upper surface of forewings grayish brown to dark brown, with outer portion of median area grayish white to very pale brown; t. a. line angulate, with basal area paler than adjacent median area; paler portion of median area with dark discal spot; t. p. line with outwardly pointing tooth on vein M_1 , then weakly dentate and paralleling outer margin; subterminal area with broad dark patch in center; terminal line black, widened in cells; fringe narrowly white at base, then dark gray, more or less narrowly interrupted at vein endings. Hind wings with variable amounts of orange and brown scaling, darkened basally and along anal angle; with small to obsolescent discal dot; extradiscal line complete, narrow; outer margin broadly brown; terminal line narrowly black; fringe with more pale scaling than on forewings. Under surface of all wings dull orange and brown, with former concentrated in outer portion of wings before brown outer areas; maculation tending to be indistinct.

Length of Forewings: Males, 18 to 19 mm; females, 20 to 21 mm.

MALE GENITALIA: Uncus sharply curved, with base 0.5 mm wide, simple, slender, sides parallel, posteriorly short, slender setae, apex sharply pointed; socius shortly digitate, with about 20 setae on each one; gnathos W-shaped, lateral arms broad, with median, curving, narrow sclerotized area, apical portion strongly recurved, prominent, thickly covered with many short setae and with terminal, thick, elongate spine; valves simple, large, wide, elongate, costa slightly widened distally, with area of slightly thickened setae near end of costa; transtilla slender, strongly curved posteriorly, with moderately wide point of attachment at midline; processes of anellus C-shaped, membranous, thickly covered with slender setae, extending as far as base of valves, 0.3 mm long; anellus as lateral troughlike structures, weakly sclerotized, membranous medially; cristae very prominent, arising from ventral parts of anellus, about 50 on each side, extending posteriorly to middle of gnathos, 0.4 mm long; tegumen with subparallel sides, posterior portions angulate, medially with moderately long area of

attachment; saccus slightly longer than tegumen, wider posteriorly, sides tapering, anterior margin flatly rounded to concave; aedeagus 2.2 to 2.3 mm long, 0.30 to 0.35 mm wide, curved, apical portion lightly sclerotized, attenuate, pointed, weakly recurved; vesica with many slender spines, deciduous, completely filling aedeagus for half its length.

FEMALE GENITALIA: Sterigma with lightly sclerotized, transverse, slightly lunate lamella antevaginalis extending width of abdomen, lamella postvaginalis smaller, more heavily sclerotized, more or less quadrate, with uneven surface; ductus bursae with broad, lateral areas appearing more heavily sclerotized than median area, sides parallel, about twice as long as wide, joining corpus bursae dorsally; ductus seminalis arising from transverse sac at posterior end of corpus bursae, ventrad of junction of ductus bursae and corpus bursae; corpus bursae elongate, about four times longer than apophyses posteriores; asymmetrical, posterior portion sclerotized, with longitudinal striations, flattened, slightly curved, diagonally expanded into slightly wider membranous anterior portion, more or less elliptical in shape; signum small, irregular in outline, situated in small rugose area, only slightly indented into corpus, variably rayed around margin. Papillae anales moderate, rounded, with median attachment for apophyses; apophyses posteriores 1.3 to 1.4 mm long, apophyses anteriores 0.4 to 0.5 mm.

TYPE SPECIES: *Calvertia fumipennis* Warren; by original designation.

DISTRIBUTION: Central and southern Chile.

FLIGHT PERIOD: December into March.

REMARKS: Only the type species is included in this genus. *Talca cataphoenissoides* Angulo has been placed as a synonym of *fumipennis* (Rindge, 1983, p. 159).

Fletcher (1979) placed *Calvertia* as a synonym of *Euclidiodes* Warren; the type species of the latter is *Heterophleps ophiusina* Butler. Fletcher thought *fumipennis* was congeneric with *ophiusina*, and hence his synonymy. I have examined the type of *fumipennis* (in USNM); Fletcher was kind enough to send me a photograph of the type of *ophiusina* (in BM). The two are not congeneric, and so *Calvertia* reverts to full generic status. As indicated in the generic bibliography, *Calvertia*

Warren is a junior homonym and hence the replacement name is required.

Incalvertia is one of the genera in which the gnathos is W-shaped; it can be distinguished from the other three by its orange-brown hind wings and large size, among other characters. The apomorphic states are given in the tables; additional distinguishing characters are given in the keys and Diagnosis.

ETYMOLOGY: The Latin prefix *in-*, meaning not, has been added to the preoccupied name; the gender is feminine. Warren (1908) stated that he named his genus after William Bartlett-Calvert; according to the International Code of Zoological Nomenclature, a genus-group name takes the gender of its suffix. Warren used the Latin suffix *-a*, which is a natural classical feminine ending, and hence he made the generic name feminine (ICZN, Art. 30b [ii]), notwithstanding the fact that the name itself is that of a man.

GENUS *CATAPHOENISSA* WARREN

Figures 28, 54, 80

Cataphoenissa Warren, 1894, p. 464. Rindge, 1971, p. 379, figs. 102–105 (adults), 108, 109 (male genitalia), 110, 111 (female genitalia); 1983, p. 159.

DIAGNOSIS: The species of this genus may be recognized by the pectinate male antennae, the swollen front, the abdominal tufts, and by the yellowish orange or reddish orange upper surface of the hind wings. The male genitalia have an elongate (1.3–1.8 mm) uncus with a dorsal group of setae, the processes of the anellus are long, slender, straight rods, and the vesica is either unarmed or has a single long (2.0 mm) spine. The female genitalia have a sclerotized lamella, the ductus bursae is either square or longer than wide, and the elongate corpus bursae may or may not have a signum.

ADULTS: Head with eyes of males narrower than width of front, of females smaller than those of males; front raised, extending one-half diameter of eyes in front of eyes, tightly scaled, without ventral tuft; palpi with second segment of both sexes 0.9 to 1.0 mm long, third segment 0.4 mm, extending beyond eyes three-fourths diameter of eyes in both sexes; antennae of approximately 69 to 84 seg-

ments, bipectinate in males, longest pectinations 0.3 to 0.4 mm, equal in length to their basal segments, pectinations arising basally on segments, having from six to nine simple segments at end of antennae, pectinations thick, apically slightly swollen and curved distally, with double row of setae below, antennae of females simple. Thorax moderately stout; patagia with scattered elongate flattened scales among numerous hairlike scales; with prominent bifurcate metathoracic tuft; foretibia of males with epiphysis arising at half length of segment and being between one-half and three-fifths its length, of females arising between just beyond one-half to three-fifths length and being two-fifths length of segment; hind tibia of males with or without hair pencil. Abdomen relatively slender in males, extending slightly beyond hind wings, in females thicker and shorter, both sexes with dorsal tufts; males without row of setae on ventral surface of third segment.

Forewings broad, apex bluntly pointed, outer margin gently rounded, slightly to deeply concave between veins; with or without one accessory cell; vein R_1 free, R_2 either free or stalked as R_{2+4} , R_5 from cell or R_{2+4} ; mdc and ldc curved. Hind wings broad, outer margin curved, dentate in lower portion; Sc paralleling R for approximately two-fifths length of cell; m and ldc curved.

Upper surface of forewings gray or brown, with cross lines *either* in normal position, black, with t. a. line slightly curved, t. p. line outwardly angled on vein M_2 , included median area dark brown in males and gray or whitish in females, *or* with cross lines widely separated, t. a. line bordered basally and t. p. line distally by ochre and brown bands, with females tending to have more brown scaling than males. Hind wings yellowish orange to reddish orange, with angled extradiscal line and incomplete grayish black border. Under surface of forewings more or less orange or orange and cream, with dark t. p. line, apex and outer margin dull black; hind wings brown or grayish white, with or without extradiscal line.

Length of Forewings: Males, 18 to 23 mm; females, 22 to 25 mm.

MALE GENITALIA: Very large; uncus curved, with base 0.6 to 0.9 mm wide, simple, sides

parallel, dorsal surface with numerous elongate setae tending to be slightly flattened apically and forming clump near end of uncus, apex with transverse ridge; socius digitate, with 10 to 25 setae on each one; gnathos V-shaped, sides with posterior portions broad, slightly tapering ventrally, apical portion recurved, in form of elongate spine; valves simple, distal portions curved, extending posteriorly to about middle of uncus, costa broad; transtilla with anterior point or angle, medially broad, posterior margin rounded, with either slender or broad point of attachment medially; processes of anellus rodlike, tapering to point, straight or very slightly curved, surface bare, 0.6 to 1.8 mm long, extending posteriorly to anterior or median section of gnathos; anellus dorsally recessed, ovate to elongate, sclerotized, with or without lateral, more heavily sclerotized areas; cristae absent; tegumen elongate, sides slender, with short anteromedian fusion; saccus longer than tegumen, tapered, anterior end rounded; aedeagus 2.0 to 5.0 mm long, 0.2 to 0.4 mm wide, slightly curved, posterior end sclerotized, bluntly pointed; vesica either unarmed or with single, elongate (2.0 mm), broad spine and about six slender, deciduous spines; vesica, when exerted, extending at between 90 and 110° angle to aedeagus, with broad spine extending more or less parallel with aedeagus, and with slender spines at various angles.

FEMALE GENITALIA: Sterigma with sclerotized, slender, bandlike lamella antevaginalis extending across width of abdomen, extending anteriorly as variously shaped ostium bursae, varying from much longer than wide and heavily sclerotized to broad, shallow, and lightly sclerotized, lamella postvaginalis not differentiated; ductus bursae sclerotized, short, square or longer than wide; ductus seminalis arising from small ventral sac at posterior end of corpus bursae; corpus bursae large to very long (7.0 mm), *either* entirely membranous (smaller ones), posterior end more or less slender, with or without longitudinal striations, and with anterior portion rounded, *or* larger one with slender, sclerotized, longitudinally striated posterior portion, anterior section membranous, attenuate, widened, anterior end rounded; signum present, vestigial, or absent, when present

varying from flat, partially indented structure to large, rounded, invaginated signum, edges variably rayed. Papillae anales with scattered very long setae in addition to short setae, with anterior attachment for apophyses; apophyses posteriores 1.6 to 2.2 mm long, apophyses anteriores 0.8 to 1.1 mm.

TYPE SPECIES: *Epimecis dibapha* C. Felder and Rogenhofer; by original designation.

DISTRIBUTION: Central and southern Chile, and adjacent Argentina.

FLIGHT PERIOD: January into early May.

REMARKS: Two species are included in this genus; see my 1971 paper for a key to them, plus full descriptions and illustrations of the adults and their genitalia.

The generic status of *Catophaenissa* [sic] *jonesaria* Schaus still remains to be determined, as I have not seen any specimens of this moth, described from Santa Catarina, Brazil, since my 1971 revision; in all probability, it does not belong in this genus.

In my 1971 paper, I included *Catophoenissa* as a member of the Nacophorini, but in 1983, I transferred it to the Lithinini, stating my supporting arguments. The present genus is one of the easiest to recognize in the Lithinini, due to the large size of the specimens and by the brightly colored upper surface of the hind wings. *Incalvertia fumipennis* (Warren) is the only other known member of the tribe to have orange hind wings; however, this species has simple male antennae, whereas the males of *Catophoenissa* have pectinate antennae. Additional differences are also given in the Diagnoses, keys, and tables of the two genera.

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