

A REVISION OF THE  
NACOPHORINI FROM COOL AND  
COLD TEMPERATE SOUTHERN  
SOUTH AMERICA (LEPIDOPTERA,  
GEOMETRIDAE)

FREDERICK H. RINDGE

BULLETIN  
OF THE  
AMERICAN MUSEUM OF NATURAL HISTORY  
VOLUME 145 : ARTICLE 4      NEW YORK : 1971







A REVISION OF THE NACOPHORINI FROM  
COOL AND COLD TEMPERATE SOUTHERN  
SOUTH AMERICA (LEPIDOPTERA,  
GEOMETRIDAE)

FREDERICK H. RINDGE

*Curator, Department of Entomology  
The American Museum of Natural History*

BULLETIN  
OF THE  
AMERICAN MUSEUM OF NATURAL HISTORY  
VOLUME 145 : ARTICLE 4                      NEW YORK : 1971



BULLETIN OF THE AMERICAN MUSEUM OF NATURAL HISTORY

Volume 145, article 4, pages 303–392, figures 1–114, table 1

*Issued September 24, 1971*

*Price: \$3.70 a copy*

This article completes Volume 145

Printed in Great Britain by Lund Humphries



## CONTENTS

INTRODUCTION . . . . .	307
Materials and Methods . . . . .	307
Acknowledgments . . . . .	308
Historical Background . . . . .	308
Phylogeny . . . . .	308
Taxonomy . . . . .	310
Key to Genera . . . . .	310
SYSTEMATIC DESCRIPTIONS . . . . .	312
Genus <i>Dentinalia</i> Heimlich . . . . .	312
<i>Malleco</i> , New Genus . . . . .	314
<i>Talca</i> , New Genus . . . . .	316
Key to Species . . . . .	318
Genus <i>Salpis</i> Mabilie . . . . .	320
Key to Species . . . . .	321
Group I . . . . .	323
Group II . . . . .	342
Group III . . . . .	348
Group IV . . . . .	360
Genus <i>Praeantartia</i> Heimlich . . . . .	374
Key to Species . . . . .	374
Genus <i>Catophoenissa</i> Warren . . . . .	379
Key to Species . . . . .	380
<i>Catocalopsis</i> , New Genus . . . . .	386
SUMMARY . . . . .	389
LIST OF SPECIES WITH THEIR KNOWN DISTRIBUTION . . . . .	389
BIBLIOGRAPHY . . . . .	390
INDEX OF SCIENTIFIC NAMES . . . . .	392







## INTRODUCTION

THE PRESENT PAPER is my second on the genera of the Nacophorini, a tribe of the Ennominae of the New World. The first (Rindge, 1961) revised *Betulodes* Thierry-Mieg, *Phaeoura* Hulst, *Thyriniteina* Möschler, and *Holochroa* Hulst. These genera form the typical section of this tribe; their species are found from southern Canada to southern South America. In Central and South America they are found primarily in the tropical and subtropical areas; one species occurs in the Greater Antilles. Since the appearance of that revision, two additional species of *Thyriniteina* have been described (*trica* Poole, 1968, card No. 25, from Venezuela; and *infans* Herbulot, 1970, p. 24, from the Galapagos Islands). I have named two additional subspecies of *Thyriniteina* *arnobia*, namely *picta* (from western Mexico and Guatemala) and *tephra* (from Baja California Sur, Mexico [Rindge, 1969, pp. 39, 40]). The only other additions to this tribe have been two new species of *Holochroa*, *ochra* and *balia* (Rindge, 1970, pp. 2, 5), that occur together on the Tres Marias Islands off the west coast of central Mexico.

The present revisionary work includes the Nacophorini from the cool and cold temperate regions of southern South America; most of the species occur in the southern Andes Mountains. The genera included differ somewhat from the typical ones covered in the first paper, and hence they are treated as a separate unit. *Salpis* Mabille is the largest and perhaps best known of these genera; a total of seven genera are included, with three of them described as new in the present paper.

At least two other genera belonging to this tribe occur in the Andes. One is *Dasystole* Warren, and the other is closely allied but unnamed; their species range from the higher mountains of Colombia south into Bolivia. The genus *Dasystole* (Warren, 1907, p. 301) has recently been revised by Poole (1969, p. 276). This genus is closely related to *Salpis*, particularly to my group III. The following characters can be used to separate the two genera: the palpi of *Dasystole* have the third segment short, whereas it is elongate in group III. In the male genitalia, the members of *Dasystole* have an apical costal flap or protuberance; this is absent in

*Salpis*. *Dasystole* has a simple anellus, whereas the members of group III have a prominent, sclerotized posteromedian extension from this structure.

The purpose of the present paper is to revise taxonomically the Nacophorini from the area of the southern Andes Mountains, and to attempt to reevaluate these moths, to answer some of the questions pertaining to their phylogeny and distribution, and to propose a more satisfactory systematic arrangement of the species. However, these tasks are greatly complicated by an insufficiency of material; much more collecting is required before enough specimens are at hand to even begin to adequately answer the above questions. Practically nothing is known about the early stages of any of the species included in this paper; the only information available is that two species of *Salpis* pupate under rocks. A thorough knowledge of the life histories would be a tremendous help in the study of this group.

## MATERIALS AND METHODS

The present revision is based on a study of the specimens in the collections of the American Museum of Natural History, the British Museum (Natural History), the United States National Museum, and Cornell University, Ithaca, New York. The two type specimens that are in this country have been studied; nearly all the remaining types are in the collections of the British Museum (Natural History) and the Museum National d'Histoire Naturelle, Paris. Of the 10 types in the former institution, I have either studied their genitalia personally, or Mr. D. S. Fletcher has been kind enough to send me photographs of the moths and their genitalia. Three types are in the Paris Museum, and Fletcher has studied and compared them with specimens in the British Museum collection; his notes and comparisons have been used by me for the determination of these species. Six primary types have not been studied; the whereabouts of the one described by Bartlett-Calvert (1891) is unknown; a second is in the collection of the Museo Nacional de Historia Natural, Santiago, Chile; one is in the Zoologischer Staatssammlung, Munchen, Germany; and the remaining three are in the private collection of Heimlich,



the present location of which is unknown to me.

All specimens I studied at the American Museum of Natural History during the preparation of this paper have had identification or type labels affixed. All too often such labeling has not been done in the past, so that the question invariably arises as to whether certain specimens were examined by a reviser.

Unless otherwise noted, all photographs were taken by the author. Various magnifications were used with the genitalia of both sexes, but this is not specifically noted on the figures. The moths photographed for this revision bear a typewritten "photo" label. In general, the adults and genitalia figured have been taken from the collection of the American Museum of Natural History. When such a procedure was not practical, the fact is specifically noted.

The following abbreviations have been used:

A.M.N.H., the American Museum of Natural History  
B.M.(N.H.), British Museum (Natural History)  
C.U., Cornell University  
U.S.N.M., United States National Museum, Smithsonian Institution.

During the course of this study, 459 specimens were examined; of these, over one-half are in the collection of the American Museum of Natural History. A total of 153 (88 males and 65 females) genitalic dissections were used, almost all made by the author.

#### ACKNOWLEDGMENTS

The author wishes to acknowledge with thanks the cooperation and aid of the following colleagues who have allowed him to study the types and specimens in their charge: Mr. D. S. Fletcher of the Department of Entomology, British Museum (Natural History); Dr. D. C. Ferguson of the Systematic Entomology Laboratory, United States Department of Agriculture, for the United States National Museum; and Dr. L. L. Pechuman of the Department of Entomology and Limnology, Cornell University, Ithaca, New York.

The present paper has been supported in part by National Science Foundation Grant GB-6478X. This assistance is gratefully acknowledged.

#### HISTORICAL BACKGROUND

The species covered in the present revisionary study are usually rather poorly represented in

collections. Nevertheless, the earliest descriptions date back almost 100 years; in 1874 (1864–1875), C. Felder, R. Felder, and Rogenhofer described two species. The next author was Butler who, in 1882, described four species, placing each in a different genus; they are all now in *Salpis*. Mabilie described *Salpis*, and its included three species, in 1885. Both Bartlett-Calvert (1891) and Dognin (1904) described single species. Prout (1910) published a revision of *Salpis*, together with four new species; his study is analyzed under the discussion of that genus herein. Since then, six more species have been added; four were named by Heimlich (1956, 1960), and one each by Sperry (1951) and Ureta (1956).

On the generic level, only four valid names exist. The earliest is *Salpis*, described in the Geometridae. However, Staudinger ("1898" [1899]) did not agree with its placement in this family, even though he apparently had not personally examined Mabilie's type species (*antennata*) for the genus; he claimed that *Salpis* was really a member of the Noctuidae. As a result, Staudinger proposed *Pseudosalpis* to contain Mabilie's other two species; this genus was placed in the Geometridae. Prout (1910) corrected Staudinger's mistake, and correctly placed *Pseudosalpis* as a synonym of *Salpis*.

The second oldest valid generic name is *Catophoenissa* Warren (1894), which was proposed for *dibapha* C. Felder, R. Felder, and Rogenhofer.

In 1956 Heimlich described *Praeantarctia* as a genus in the family Notodontidae. In 1960, he transferred it to the Geometridae, and proposed *Dentialia* in addition.

#### PHYLOGENY

It is rather difficult to generalize about the phylogeny of the seven genera included in this revision. In the typical section of the tribe some of the characters that I (Rindge, 1961) considered to be primitive were two pairs of spurs on the hind tibia, moderately long palpi, bipectinate male antennae with a long terminal seta and a shorter seta at the end of each pectination, simple female antennae, scalloped wing margins, and the origin of veins R and M<sub>1</sub> before the upper angle in the hind wings. The more advanced characters are a single pair of spurs on the hind tibia, short palpi, a long terminal seta only on the male antennae, shortly serrate or

shortly bipectinate female antennae, smooth wing margins, and veins R and M<sub>1</sub> arising at, or stalked beyond, the upper angle of the hind wings. The males have neither a hair pencil on the hind tibia nor the row of setae on the ventral surface of the third abdominal segment.

In the seven genera included in this revision, the males of six may have a tibial hair pencil; in two of these genera it is apparently a specific character, as some species lack this secondary sexual modification. The ventral row of setae on the third abdominal segment usually is absent, although it is present in some species of *Salpis*. The males of all genera lack the elongate terminal antennal seta found in the typical section of the tribe. Four of the present genera have bipectinate male antennae, *Salpis* has pectinate, fasciculate, and simple antennae, whereas the remaining two have simple antennae. As regards female antennae, *Salpis* may have shortly bipectinate, fasciculate, serrate, or simple antennae; all the other species have simple antennae except for one species of *Praeantartia* that has serrate antennae. The palpi have a short third segment in one genus, a second has both short and long, and the remaining five genera all have long or very long terminal segments. The shape of the wings and the nature of the wing margins (scalloped or evenly rounded) seems to be more of a specific than a generic character. The hind wing venation seems to be consistent in that all genera veins R and M<sub>1</sub> arise before the upper angle.

Table 1 shows that the various characters seem to form a mosaic, with no really clear-cut pattern of primitive or advanced forms. This is probably due to the relatively recent origin of this group of moths in a highly varied montane region. The typical section of the tribe is thought to be of greater age, and to have developed in a much more uniform, tropical and subtropical environment, where the members still occur. As a result, the characters are more stable, and evolutionary trends are more easily observed.

In the present paper I have tried to arrange the genera from the more primitive to the more highly evolved. The genus *Dentinalia* appears to have more primitive characters; the upper surface of the wings is dark gray. Both *Malleco* and *Talca* have a similar type of color and maculation, and so are grouped with *Dentinalia*, even though they possess more advanced characters. The very large genus *Salpis* follows; the included

TABLE 1  
OCCURRENCE OF CHARACTERS

	<i>Dentinalia</i>	<i>Malleco</i>	<i>Talca</i>	<i>Salpis</i>	<i>Praeantartia</i>	<i>Catophoenissa</i>	<i>Catocalopsis</i>
♂ antennae:							
Bipectinate	+	—	+	+	+	+	—
Fasciculate	—	—	—	+	—	—	—
Simple	—	+	—	+	—	—	+
♀ antennae:							
Bipectinate	—	—	—	+	—	—	—
Fasciculate	—	—	—	+	—	—	—
Serrate	—	—	—	+	+	—	—
Simple	+	+	+	+	+	+	+
Terminal segment of palpi:							
Short	—	—	—	—	+	+	—
Very long	+	+	+	+	+	—	+
♂ hind tibial hair pencil	—	+	+	±	+	±	+
Row of setae on A <sub>3</sub>	—	—	—	±	—	—	—
Thoracic tufts	+	+	+	—	+	+	+
Abdominal tufts	—	+	—	—	+	+	+

Symbols: +, character present; ±, character present or absent; —, character absent.

species vary considerably in their characteristics. *Praeantartia* is next; one of its species shows strong sexual dimorphism in color and pattern. The last two genera both have red or orange hind wings. They are not particularly closely related, as *Catophoenissa* has considerably more primitive characters than does *Catocalopsis*. The latter is probably the most highly evolved genus treated in this paper.

The male genitalia do not show any noticeable evolutionary trends, with the possible exception of an increase in size of the vesica and in having more numerous spines in the more advanced genera. *Dentinalia* has greatly reduced processes of the anellus; all the other genera have these structures well developed. The most striking modification in the entire group is the very large, trifid uncus of *Catocalopsis*.

In trying to ascertain evolutionary trends the female genitalia apparently are even less useful than are the male organs. Many of the species have good specific characters, but it is difficult to satisfactorily separate some of the genera by using these structures.

## TAXONOMY

The moths discussed in the present revision can usually be recognized without much difficulty, although they possess certain characters that set them apart from the typical section of the Nacophorini (Rindge, 1961, p. 93). The included species may (three genera) or may not (four genera) have abdominal tufts, they all possess two pairs of spurs on the hind tibia, and none has the elongate seta at the end of each pectination of the male antenna that is characteristic of the tropical and more northern members of this tribe. Whereas the female ovipositor lobes of all members of the latter group have the point of attachment of the apophyses posteriores in the center of the lobes on a sclerotized strip, the present group has the much commoner anterior or median attachment.

The genera included in this paper have a number of characters in common, which are summarized below to avoid repetition in the generic descriptions.

Head, eyes moderate, round; front flat, slightly swollen, or swollen; tongue well developed; palpi well developed, with third segment varying from short to very long and cylindrical; antennae of male simple, fasciculate, or shortly bipectinate, the pectinations arising in basal portion of segments and with apical segments simple, each pectination with numerous setae and often somewhat enlarged distally; antennae of female simple, serrate, or shortly pectinate. Thorax stout or moderate, with either spatulate scales, elongate hairlike scales, or combination of these; fore tibiae unarmed, with process arising in male from near center and extending to or beyond end of segment, in female arising near center and extending from one-half to all the way to end of segment; hind tibia with two pairs of spurs, and in males either dilated and having hair pencil or simple. Abdomen stout or moderate, with or without middorsal segmental tufts; ventral surface of third segment with or without row of setae in males, and eighth segment without plate. Forewings broadly triangular to elongate, alike in both sexes; with variable radial venation, 12 veins, with or without single areole,  $R_1$  and  $R_2$  from top of cell,  $R_5$  from stalk before  $R_{3+4}$ ;  $M_1$  from upper angle,  $M_2$  usually tending to be rather weak, with dc weak;  $Cu_1$  from below lower angle; fovea absent. Hind wings broad, often tending to be concave between veins; frenulum strong in both

sexes; Sc approximate to R near base, near middle of cell, or not at all; R and  $M_1$  from before upper angle;  $M_3$  from lower angle; cell elongate, extending beyond middle of wing;  $Cu_1$  from one-third or one-half distance between angle and  $Cu_2$ .

## MALE GENITALIA

Uncus variable, either simple, narrow, elongate, curving ventrally, or somewhat reduced and triangular, or strongly trifold; socius present, varying from large and prominent to greatly reduced; gnathos V-shaped or quadrate, sclerotized, with median region either heavily sclerotized or shortly spinose; valves moderately large, broad, symmetrical, costal region sclerotized but not reaching apex, remainder of valve membranous, some species with sclerotized processes from inner face; transtilla well developed; anellus with pair of large, posterolateral, pointed, heavily sclerotized structures, rarely reduced; anellus sclerotized, broad; cristae present or absent; furca absent; tegumen broad; saccus as long as, or longer than, length of tegumen, broad, truncate or broadly rounded anteriorly; aedeagus slender; vesica unarmed or with few to many cornuti.

## FEMALE GENITALIA

Ovipositor lobes elongate and narrow, with apophyses attached near middle of anterior margin or anteriorly; sterigma variable, with or without prominent lamella antevaginalis; ductus bursae either short and well defined, or united with corpus bursae; ductus seminalis either arising near junction of ductus bursae and corpus bursae, or from small posterior lobe of corpus bursae; corpus bursae small to elongate, rounded to very long and slender; with or without signum.

It has not been possible to prepare a satisfactory, workable key to the genera based on the female genitalia, as these structures are basically similar to one another in several of the different genera. Good characters are present on the specific level, but this does not necessarily hold for the genera.

## KEY TO GENERA

## BASED ON EXTERNAL MORPHOLOGY

1. Thorax with collar and patagia of very long, hairlike scales, those from patagia extending over anterior portion of abdomen;



- thorax without posterior tufts . . . *Salpis*  
 Thorax with collar and patagia with at least  
 some shorter, terminally spatulate, scales;  
 thorax with posterior tufts . . . . . 2  
 2(1). Abdomen with dorsal tufts . . . . . 3  
 Abdomen without dorsal tufts . . . . . 6  
 3(2). Palpi with third segment very short . . . 4  
 Palpi with third segment very long and  
 cylindrical . . . . . 5  
 4(3). Hind wings with upper surface white or  
 grayish white . . . . . *Praeantarctia*  
 Hind wings with upper surface red or orange  
 . . . . . *Catophoenissa*  
 5(3). Hind wings with upper surface concolorous  
 with forewings . . . . . *Malleco*  
 Hind wings with upper surface red . . . . .  
 . . . . . *Catocalopsis*  
 6(2). Male with hind tibia having hair pencil . .  
 . . . . . *Talca*  
 Male with hind tibia without hair pencil . .  
 . . . . . *Dentinalia*

# BASED ON MALE GENITALIA

1. Uncus trifold . . . . . *Catocalopsis*  
 Uncus simple . . . . . 2  
 2(1). Anellus with paired processes very large,  
 enlarged medially, and with surface  
 thickly covered with fine setae; aedeagus  
 with exserted vesica very large, roughly  
 T-shaped . . . . . *Talca*  
 Anellus not as above, without setae; vesica a  
 simple tube . . . . . 3  
 3(2). Valve with large, dentate, curved costal  
 protuberance . . . . . *Dentinalia*  
 Valve with costa not as above, simple . . 4  
 4(3). Gnathos with anteroventral one-half setose  
 . . . . . *Malleco*  
 Gnathos not as above . . . . . 5  
 5(4). Uncus with numerous setae on dorsal surface  
 . . . . . *Catophoenissa*  
 Uncus without dorsal setae . . . . . 6  
 6(5). Gnathos quadrate or extending ventrally as  
 two sclerotized arms . . . . . *Praeantarctia*  
 Gnathos V-shaped . . . . . *Salpis*

## SYSTEMATIC DESCRIPTIONS

### GENUS *DENTINALIA* HEIMLICH

*Dentinalia* HEIMLICH, 1960, p. 268.

**DIAGNOSIS:** This genus can be recognized by the large, curved, and spinose costal swelling of the male genitalia, and by the greatly reduced lateral structures of the anellus.

Head, front swollen; palpi with third segment moderately long, equal to about half of length of eye; antennae of male pectinate, each pectination with distal margin bearing small papillae with minute setae, with pectinations extending to end of antennae; antennae of female simple. Thorax covered dorsally with mixture of spatulate and hairlike scales; patagia moderately long, extending almost to paired metathoracic tufts; hind tibia of male without hair pencil. Abdomen without dorsal tufts; ventral surface of third segment of male without row of setae. Wings elongate; forewings with outer margin rounded and weakly dentate; outer margin of hind wings moderately crenulate; forewings without areole; hind wing with Sc approximate to R for one-half of length of cell.

Upper surface of wings dark gray with brown scaling, with forewings darker, having more maculation than hind wings. Cross lines present, somewhat irregular in course. Under surface of wings gray, with outer cross line present. Discal dot large and prominent on hind wings below.

**MALE GENITALIA:** Uncus elongate, tapering to slender point; socius weakly developed; gnathos very large, elongate, heavily sclerotized, apically rounded; valves simple except for large costal swelling, apically curved and spinose, and bearing large group of hairlike scales basally; anellus moderate, with small, posterior, median projection, and with lateral structures greatly reduced to U-shaped base and minute projection; aedeagus short and relatively wide; vesica small, extending at angle to aedeagus, and having from one to five spines on posterior surface.

**FEMALE GENITALIA:** Ovipositor lobes with apophyses attached near middle of anterior margin; sterigma with weak lamella antevaginalis; ductus bursae short, distinct; ductus seminalis arising from near posterior end of corpus bursae, ventrally on right side near junction with ductus bursae, then curving dor-

sally and anteriorly; corpus bursae with short, posterior, lightly sclerotized, longitudinally striate neck, and with globular anterior portion; signum moderate, pouchlike.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPE SPECIES:** *Dentinalia forsteri* Heimlich; by original designation.

The single included species is basically similar in color and pattern to the species of the following two genera, but it can easily be recognized by the genitalic structures.

### *Dentinalia forsteri* Heimlich

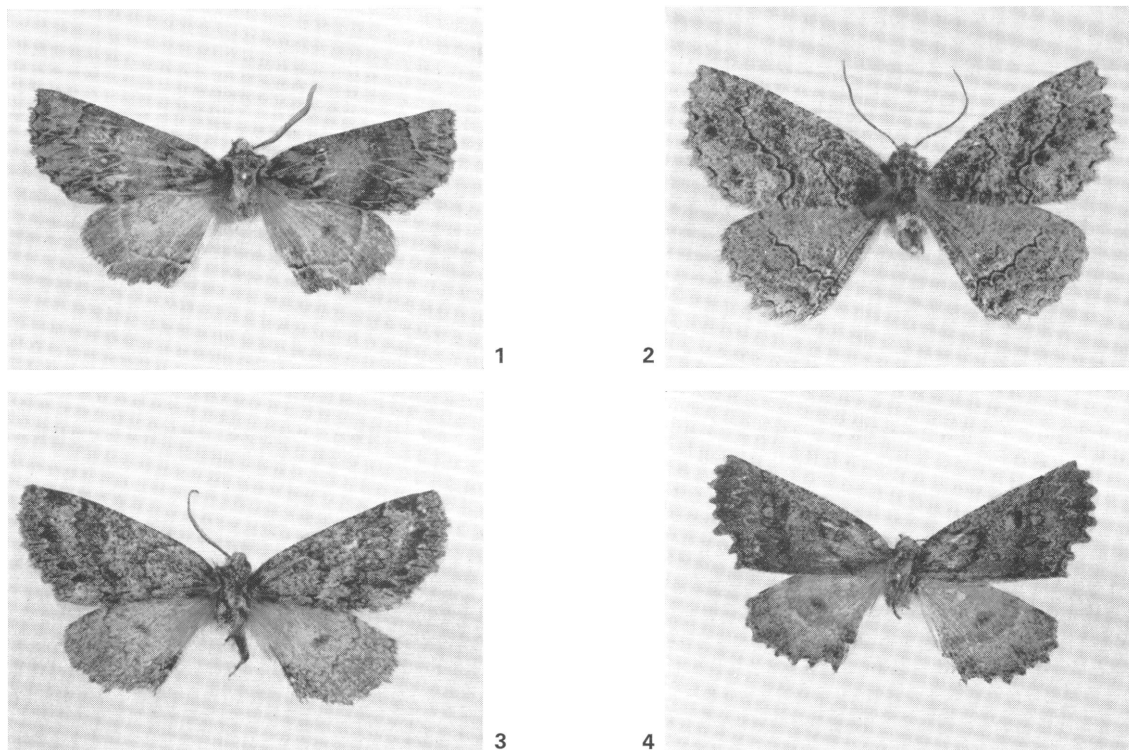
Figures 1, 5, 8

*Dentinalia forsteri* HEIMLICH, 1960, p. 269, figs. 1 (venation), 2 (male genitalia), 3-7 (adults).

**DIAGNOSIS:** This species can be recognized by the generic characters.

**MALE:** Head with vertex and front covered with long gray and grayish brown scales; palpi not attaining middle of eye, covered with dark gray and brownish black scales; antennae with longest pectinations 0.75 mm. in length. Thorax dark gray or grayish black above, with many scales white or grayish tipped, especially along end of collar; gray or grayish brown below; legs gray, with variable number of dark grayish brown and brownish black scales, tarsus with ends of segments broadly pale. Abdomen above gray, with numerous dark gray and with scattered blackish gray scales, narrowly paler at ends of segments; paler below.

**UPPER SURFACE OF WINGS:** Forewings dark gray or grayish brown, with numerous brownish black scales, and with median area tending to be all or mostly pale gray; cross lines slender, black; basal area with longitudinal black streak anterior of cubital vein extending to t. a. line; latter arising on costa one-fifth of distance from base, sharply angled outward into cell, then curved or angled inward to meet basal streak, then outwardly curved to inner margin; discal spot represented by raised scales, usually rather inconspicuous; median shade line varying from obsolescent to rather broad and nebulous, gently curving across wing; t. p. line arising on costa about three-fourths of distance from base, deeply dentate basally on veins, outwardly curved in



FIGS. 1-4. Adults. 1. *Dentinalia forsteri* Heimlich, male, Las Trancas, Ñuble Province, Chile, October, 1967 (L. E. Peña; A.M.N.H.). 2. *Malleco versicolor*, new species, holotype male, Caramavida, Arauco Province, Chile, January 30-31, 1967 (L. E. Peña; A.M.N.H.). 3. *Talca incurva*, new species, holotype male, Río Blanco, Malleco Province, Chile, February, 1964 (L. E. Peña; A.M.N.H.). 4. *Talca absconda* (Heimlich), female, Las Trancas, Ñuble Province, Chile, November 21-30, 1964 (L. E. Peña; A.M.N.H.). All  $\times 1.5$ .

middle of wing, then swinging basally above inner margin; subterminal area brown, widest and most noticeable in upper portion of wing; s. t. line white, weakly represented anteriorly, fading out posteriorly; terminal area with longitudinal black scaling in some cells in lower part of wing, these sometimes extending into subterminal area; terminal line black, narrow, interrupted by veins; fringe concolorous with wing. Hind wings gray, with scattered grayish brown and grayish black scales; discal spot present, large; extradiscal line complete, angled or sharply curved in middle of wing, and with distal grayish white shade band of varying thickness; subterminal area with some dark scaling; terminal line obsolescent; fringe concolorous with wing.

**UNDER SURFACE OF WINGS:** Forewings gray, with variable number of dark gray scales and with scattered grayish black scales; hind wings

pale gray, with more or less evenly scattered grayish black scales; discal spot and outer cross line weakly represented on forewings, strongly on hind wings; terminal line absent on forewings, present on hind wings; fringe concolorous with wings.

**LENGTH OF FOREWING:** 18 to 20 mm.

**FEMALE:** Similar to male; eyes slightly smaller; upper surface of all wings tending to be slightly darker and more evenly colored.

**LENGTH OF FOREWING:** 18 to 20 mm.

**MALE GENITALIA:** As described for the genus.

**FEMALE GENITALIA:** As described for the genus.

**TYPE:** Holotype, male, was said by Heimlich to be in his private collection.

**TYPE LOCALITY:** Near Chillan, Ñuble Province, Chile.

**DISTRIBUTION:** Andes Mountains of central Chile (the provinces of Ñuble, Malleco, and Osorno).



TIME OF FLIGHT: October, December, January, and March.

REMARKS: Seven specimens (five males and two females) and four genitalic dissections (three males and one female) have been studied.

Unfortunately all the specimens are at least somewhat rubbed and worn. The moths caught in October, December, and January tend to be quite dark scaled above, whereas the single March specimen is more of a uniform gray coloration.

My identification of this species is based on the photograph of the adults (figs. 3-7). There may be some doubt as to whether this is correct, as Heimlich's crude drawing (fig. 2) of the male genitalia is practically worthless. He shows the genitalia in a lateral view, and hence many of the important characters are not illustrated at all. One of the more puzzling aspects of this figure is the apparent lack of the large, curved, and spinose costal swelling of the valve. Heimlich's figure shows a rounded swelling on the valves, with only one of them having a sinuous seta-like process. I am assuming that Heimlich's genitalic figure is in error in this respect, and that the valves were not properly drawn.

#### MALLECO, NEW GENUS

DIAGNOSIS: This genus can be recognized by the palpi having the terminal segment long and cylindrical, by the male genitalia having a simple costa, and by the gnathos with the anteroventral half setose.

Head, front swollen; palpi with third segment long and slender, equal to about two-thirds of length of eye; antennae of both male and female simple. Thorax covered dorsally with spatulate scales, and some hairlike scales; patagia moderately long, extending as far as paired metathoracic tufts; hind tibia of male with hair pencil. Abdomen with dorsal tufts; ventral surface of third segment of male without row of setae. Wings broad, with all outer margins dentate; forewing with aerole; hind wing with Sc approximate to R for two-thirds length of cell.

Upper surface of wings dark gray or brownish gray, with forewings and hind wings having similar color and maculation. Cross lines present, somewhat irregular in course. Under surface of wings also grayish brown, with reduced maculation.

MALE GENITALIA: Uncus slender, elongate; socius moderate; gnathos V-shaped, with antero-

ventral portion covered with numerous spines; valves simple, with costa sclerotized to end and swollen near apex; anellus with elongate, slender sclerotized processes having wide bases; aedeagus small, shorter than combined lengths of saccus and tegumen; vesica a simple tube with small blind sac and several small spines, when exerted it extends either parallel with axis of aedeagus or at slight angle thereto.

FEMALE GENITALIA: Ovipositor lobes with anterior margin broadly sclerotized, with apophyses attached thereto; sterigma without lamella antevaginalis; ductus bursae short, wider than long; ductus seminalis arising ventrally and slightly to left of junction of ductus bursae and corpus bursae; corpus bursae very long and slender, occupying most of length of abdomen; signum absent.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE SPECIES: *Malleco versicolor*, new species.

The single included species of *Malleco* is easily separated from the members of *Catophoenissa* and *Catocalopsis* by the color and pattern of the upper surface of its wings. Structurally the moths are similar to those of *Catocalopsis*, but can be distinguished by having a swollen front, by the shorter and broader wings, and by the genitalia.

ETYMOLOGY: This name is that of one of the provinces of Chile. Its gender is masculine.

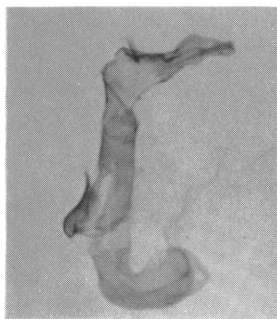
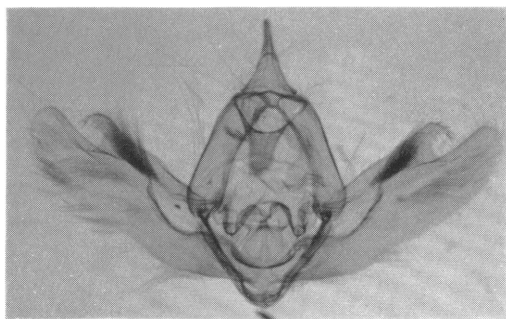
#### *Malleco versicolor*, new species

Figures 2, 6, 9

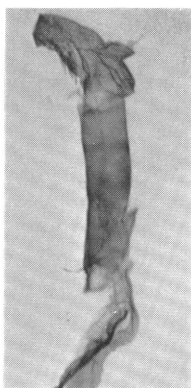
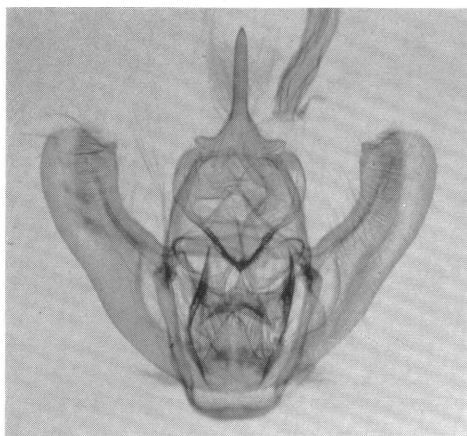
DIAGNOSIS: This species can be recognized by the generic characters.

MALE: Head, vertex, and front grayish brown, most of the scales having apices pale gray, with some grayish black scaling; palpi black or grayish black on outer surface, with pale gray scaling on inner surface and at ends of segments. Thorax above covered with mixture of pale gray, brown, and grayish black scales, with variable number of chartreuse scales; black scales on collar and as band across patagia; posterior tufts pale gray; ventral surface grayish brown; legs pale gray, with many dark grayish brown scales. Abdomen above gray, with variable number of brown and grayish black scales; tufts and posterior margins of segments pale gray; below paler.

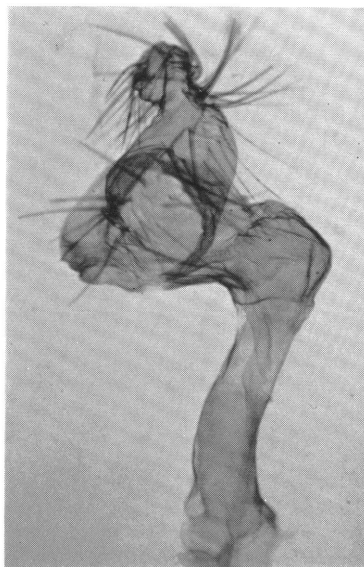
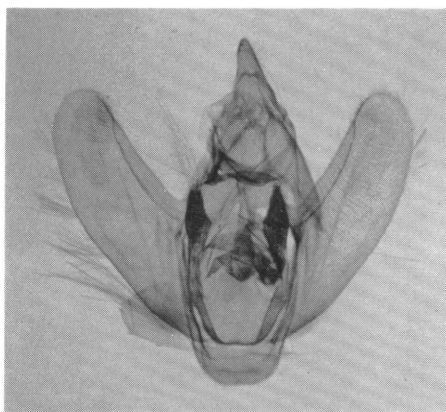
UPPER SURFACE OF WINGS: Pale gray, with variable number of dark gray, brown, and grayish black scales, the wings varying in color from gray to mostly dark brown, and with variable



5



6



7

FIGS. 5-7. Male Genitalia. 5. *Dentinalia forsteri* Heimlich, Icalma, Malleco Province, Chile, January 2, 1968 (L. E. Peña; A.M.N.H.). 6. *Malleco versicolor*, new species, holotype, Caramavida, Arauco Province, Chile, January 30-31, 1967 (L. E. Peña; A.M.N.H.). 7. *Talca incurva*, new species, paratype, Icalma, Malleco Province, Chile, January 2, 1968 (L.E. Peña; A.M.N.H.).

number of chartreuse scales along veins, ranging from practically none to solid rows; forewings with black, complete, cross lines; basal line absent; t. a. line arising on costa one-third of distance from base as inwardly projecting line with wide, pale gray basal shading, sharply curving outward along radial vein, turning posteriad and being biconvex in cell, thence running basally across wing, with inward teeth on veins; median shade line broad, nebulous, near t. p. line; discal dash obsolescent; t. p. line arising on costa three-fourths of distance from base, curving outward and then basally, with large concave bend in cell  $Cu_2$ , angled toward inner margin from anal vein, with small outward projections on all veins; t. p. line with narrow, pale gray to dark gray, posterior shade line extending distally on veins, and followed by broad, rather nebulous, grayish brown to dark brown shade band; subterminal area light gray above inner margin; s. t. line varying from partially represented to complete, pale gray, paralleling outer margin, and having variable number of dark gray or brown scales on both sides, but tending to have wider outer shading; terminal line black or brownish black, broadly interrupted by veins; fringe concolorous with wing. Hind wings concolorous with forewings, with broad basal portion slightly paler than outer area; intradiscal line and discal spot absent; nebulous median shade band may be present in lower part of wing in some specimens; extradiscal line complete, approximately straight in over-all course, with outward bends on veins; s. t. line pale gray, more or less complete; terminal line and fringe as on forewings.

**UNDER SURFACE OF WINGS:** Forewings dark gray or grayish brown, except for pale gray inner margin; t. a. line and discal dash faintly represented in some specimens; t. p. line varying from weak to complete, more strongly represented on veins, course as on upper surface. Hind wings light gray, evenly suffused with dark gray and grayish black scales; discal spot and extradiscal line strongly represented.

**LENGTH OF FOREWING:** 21 to 22 mm.; holotype, 21 mm.

**FEMALE:** Similar to male (as far as can be told from the single, worn specimen).

**LENGTH OF FOREWING:** 24 mm.

**MALE GENITALIA:** As described for the genus.

**FEMALE GENITALIA:** As described for the genus.

**TYPES:** Holotype, male, Caramavida, east of

Angol, Nahuelbuta Mountains, Arauco Province, Chile, January 30–31, 1967 (L. E. Peña); collected in *Araucaria* forest. The genitalia of the holotype are mounted on slide F.H.R. No. 15744. Paratypes, all from Chile: Estero de Leiva, Cordillera Parral, Andes Mountains, Linares Province, January 8–12, 1953 (L. E. Peña), one male; Las Trancas, mountains in Chillan area, elevation 1200 meters, Ñuble Province, February 7–12, 1966 (L. E. Peña), one female; Cordillera de Las Raices, mountains in Lonquimay area, Malleco Province, December 28–29, 1967 (L. E. Peña), one male.

All the above type material is in the collection of the American Museum of Natural History.

**DISTRIBUTION:** Central Chile, being known from the provinces of Linares, Ñuble, Malleco, and Arauco. The localities from the first three are in the Andes; the last is in the coastal mountains.

**TIME OF FLIGHT:** December, January, and February.

**REMARKS:** Four specimens (three males and one female) and three genitalic dissections (two males and one female) have been examined.

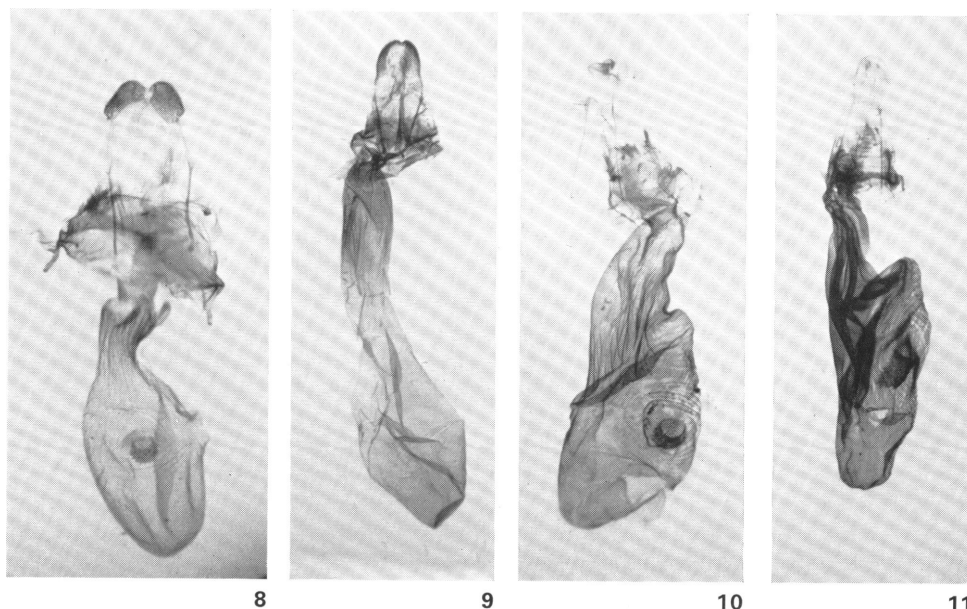
All three males are rather different from one another. The Linares specimen has the upper surface of the wings heavily suffused with brownish black scales; the Malleco male has relatively little dark scaling; and the type, from Arauco, is rather intermediate in this condition. In addition, the type has the greatest amount of chartreuse scaling on the thorax and wings.

#### TALCA, NEW GENUS

**DIAGNOSIS:** This genus can be recognized by the male genitalia having the paired processes of the anellus very large, enlarged medially, and with the surface thickly covered with fine setae; in addition, the exserted vesica is very large and roughly T-shaped.

Head, front swollen or flat; palpi with third segment long and slender, equal to one-half to two-thirds of length of eye; antennae of male pectinate, each pectination thickened and flattened, with pectinations extending to end of antenna; antennae of female simple. Thorax covered dorsally with mixture of spatulate and hairlike scales; patagia moderately long, extending as far as paired metathoracic tufts; hind tibia of male with hair pencil. Abdomen without dorsal tufts; ventral surface of third segment of





FIGS. 8-11. Female Genitalia. 8. *Dentinalia forsteri* Heimlich, Icalma, Malleco Province, Chile, January 2, 1968 (L. E. Peña; A.M.N.H.). 9. *Malleco versicolor*, new species, paratype, Las Trancas, Ñuble Province, Chile, February 7-12, 1966 (L. E. Peña; A.M.N.H.). 10. *Talca incurva*, new species, allotype, Río Blanco, Malleco Province, Chile, February, 1964 (L. E. Peña; A.M.N.H.). 11. *Talca absconda* (Heimlich), Las Trancas, Ñuble Province, Chile, November 21-30, 1964 (L. E. Peña; A.M.N.H.).

male without row of setae. Wings elongate; forewings with outer margin rounded and dentate; outer margin of hind wings weakly to strongly dentate; forewing with or without areole (both conditions may occur in same species); hind wing with Sc approximate to R for two-thirds of length of cell.

Upper surface of wings dark gray or brownish gray, with forewings darker, having more maculation than hind wings. Cross lines present and somewhat irregular in course. Under surface of wings also grayish brown, with maculation somewhat reduced from that of upper surface of forewings, but with distinct extradiscal line on hind wings. Large, elongate, and prominent discal spots present on all wings, both above and below.

MALE GENITALIA: Uncus triangular; socius weakly developed; gnathos V-shaped, with large, well-sclerotized V-shaped median area; valves simple, relatively broad; anellus with very large, medially swollen and finely setose sclerotized structures; vesica very large, extend-

ing at right angle to aedeagus, with posteriorly directed extension having numerous, elongate setae.

FEMALE GENITALIA: Ovipositor lobes with apophyses attached near middle of anterior margin; sterigma with more or less well defined lamellae; ductus bursae short, distinct; ductus seminalis arising from posterior end of corpus bursae, near junction of latter and ductus bursae; corpus bursae elongate, asymmetrical, posteriorly sclerotized, anterior membranous area enlarged on right side; signum large, pouchlike, subrectangular.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE SPECIES: *Talca incurva*, new species.

The two species included in this genus are basically similar to *Malleco versicolor* in color and pattern. However, they differ in the pectinate male antennae, wing shape, and genitalia of both sexes.

ETYMOLOGY: This name is that of one of the provinces of Chile. Its gender is feminine.

KEY TO SPECIES<sup>1</sup>

## BASED ON COLOR AND WING SHAPE

Forewings with upper surface gray; outer margins of all wings weakly crenulate . . . . . *incurva*

Forewings with upper surface brown; outer margins of all wings very strongly crenulate . . . . . *absconda*

## BASED ON FEMALE GENITALIA

Ductus bursae twice as wide as long; corpus bursae with posterior portion arcuate . . . . . *incurva*

Ductus bursae slightly longer than wide; corpus bursae straight . . . . . *absconda*

<sup>1</sup>The males of *absconda* are not known.

**Talca incurva**, new species

Figures 3, 7, 10

**DIAGNOSIS:** This species can be separated from the following one by its larger size, grayish brown or dark gray color, its more or less clearly defined cross lines, and with the hind wings being somewhat paler than the forewings; all wings have the outer margins weakly crenulate.

**MALE:** Head with vertex having mixed dark grayish brown hairlike scales and white-tipped spatulate scales, with narrow band of white between bases of antennae; front dark grayish brown, long scaled; palpi blackish brown, with grayish white scaling dorsally and on inner surface of terminal segment. Thorax above with mixture of dark grayish brown hairlike scales and white tipped spatulate scales; below grayish brown; legs grayish white, with numerous grayish black scales, tibia and tarsi mostly grayish black, latter with ends of segments grayish white. Abdomen whitish gray, with scattered brown and grayish black scales, above and below.

**UPPER SURFACE OF WINGS:** Forewings pale gray, heavily and evenly overlain with dark gray, grayish brown, and black scales except for upper portion of subterminal area; cross lines black, slender; t. a. line arising on costa one-fourth of distance from base, broadly curving outward to middle of wing, then basad to anal vein, thence outwardly angled to inner margin, with line tending to be slightly thickened on veins and to have slender grayish white basal shade line; discal spot elongate, about 2 mm. in length; median shade line obsolescent or weakly indicated just basad of t. p. line; latter arising three-fourths of distance from base, subparallel to outer margin, inwardly dentate on veins, and with narrow white distal shade line; s. t. line complete, grayish white, broadly shaded

basally by black and brownish black scaling, inwardly dentate on veins, paralleling outer margin; terminal area with veins black scaled; terminal line absent; fringe concolorous with forewing. Hind wings grayish white, outer portion with scattered dark gray and grayish black scales; discal spot elongate; extradiscal cross line complete, slender, somewhat irregular in course; terminal line and fringe similar to those of forewings.

**UNDER SURFACE OF WINGS:** Forewings gray, heavily suffused with grayish brown and dark gray scales except for along inner margin; discal dot and t. p. line weakly represented, with latter marked on costa by white spot; hind wings pale gray, with ochraceous veins, and with scattered dark gray and brownish black scales; discal spot large, prominent; extradiscal line complete, more heavily represented than on upper surface; terminal lines absent; fringes concolorous with wings.

**LENGTH OF FOREWING:** 20 to 21 mm.; holotype, 20 mm.

**FEMALE:** Similar to male, but with color tending to be slightly more contrasting and with maculation more clearly represented.

**LENGTH OF FOREWING:** 19 to 22 mm.; allotype, 20 mm.

**MALE GENITALIA:** As described for the genus.

**FEMALE GENITALIA:** Sterigma with triangular lamella antevaginalis, and with more heavily sclerotized lamella postvaginalis having small, median triangular structure posteriorly; ductus bursae 0.85 mm. wide posteriorly, being about twice as wide as long; ductus seminalis arising from small sac at posterior end of corpus bursae to right of ductus bursae; corpus bursae with posterior portion extending beyond junction with ductus bursae on right side, anteriorly curving and becoming enlarged, sclerotized, and bearing longitudinal striations, with more or less wavy line of junction with large, globular, membranous anterior portion, the latter having some roughly concentric raised ridges around signum; latter 0.75 mm. in length; apophyses posteriores 2.2 to 2.7 mm. in length.

**TYPES:** Holotype, male, and allotype, female, Río Blanco, Curacautin, Andes Mountains, Malleco Province, Chile, February, 1964 (L. E. Peña). The genitalia of the holotype are mounted on slide F.H.R. No. 13098, and of the allotype on No. 15567. Paratypes, all from Chile: Same data as holotype, one male and four

females; Icalma, Cordillera Lonquimay, elevation 1050 to 1100 meters, southeastern Malleco Province, January 2, 1963 (L. E. Peña), one male and one female; Cordillera de las Raices, mountains in Lonquimay area, Malleco Province, December 28, 1968 (L. E. Peña), one female; Las Trancas, mountains in Chillan area, elevation 1200 meters, Ñuble Province, February 7–12, 1966 (L. E. Peña), one female.

All the above type material is in the collection of the American Museum of Natural History.

**DISTRIBUTION:** Central Chile, in the Andes Mountains (the provinces of Ñuble and Malleco). The specimens from the type locality were taken in a *Nothofagus* forest.

**TIME OF FLIGHT:** December, January, and February.

**REMARKS:** Eleven specimens (three males and eight females) and four genitalic dissections (two males and two females) have been studied.

**Talca absconda** (Heimlich), new combination  
Figures 4, 11

*Dentinalia absconda* HEIMLICH, 1960, p. 271, figs. 8–10 (adults).

**DIAGNOSIS:** This species has the outer margins of all the wings strongly crenulate, and the upper surface of the forewings is much browner than that of *incurva*.

**MALE:** Unknown.

**FEMALE:** Head with vertex grayish brown, with most scales very broad, and with narrow band of grayish white between bases of antennae; front flat, apparently grayish brown (but mostly denuded); palpi pale gray, with numerous dark grayish brown and brownish black scales. Thorax above with mixture of dark grayish brown hairlike scales and white-tipped spatulate scales; below brownish gray; legs mostly dark grayish brown and black, with scattered white scales, with some indication of narrow terminal band at ends of tarsal segments.

**UPPER SURFACE OF WINGS:** Forewings grayish brown, with numerous, evenly distributed, dark gray, dark brown, and grayish black scales, with subterminal area dark brown and terminal area grayish black; cross lines grayish black; t. a. line rather diffuse, arising on costa between one-fifth and one-fourth of distance from base, sharply angled anteriorly, paralleling inner margin to cell, then biangulate basally to inner margin; discal spot black, large, elongate, 1.5 mm. in length; median shade line complete, diffuse,

extending straight across wing; t. p. line arising on costa about three-fourths of distance from base, very slender, paralleling outer margin, dentate, with elongate, basal extensions on veins; s. t. line white, slender, strongly dentate; terminal line black, narrow, interrupted by projecting veins; fringe concolorous with wing. Hind wings pale gray, with numerous dark gray and grayish brown scales distally; discal spot dark gray, large, elongate; extradiscal line complete, more or less geminate, rather diffuse; s. t. line absent except for spot near anal angle; terminal line obsolescent; fringe tending to be checkered, darker at vein endings.

**UNDER SURFACE OF WINGS:** Forewings gray, suffused with dark gray basad of complete t. p. line, with brown scaling below costa in subterminal area and on fringes; hind wings pale gray, basal portion of wing suffused with ochraceous, and entire wing with scattered brownish black scales; discal spot present on each wing, large, elongate, with spot on hind wing larger than that on forewing; hind wings with broad, complete, black and grayish black extradiscal line; terminal line represented by intravenular dots on all wings.

**LENGTH OF FOREWING:** 18 mm.

**MALE GENITALIA:** Unknown.

**FEMALE GENITALIA:** Sterigma with transverse lamella antevaginalis, swollen medially, and with poorly defined lamella postvaginalis; ductus bursae 0.4 mm. wide posteriorly, slightly longer than wide; ductus seminalis arising ventrad and slightly to left of ductus bursae; corpus bursae with more or less straight, heavily sclerotized and convoluted posterior portion, sharply enlarged on angle to form very wide junction with elongate, membranous anterior portion, the latter with numerous, roughly concentric raised ridges around signum; signum length 1.0 mm.; apophyses posteriores length 2.1 mm.

**TYPE:** Holotype, female, was said by Heimlich to be in his private collection.

**TYPE LOCALITY:** Near Chillan, Ñuble Province, Chile.

**DISTRIBUTION:** Andes Mountains of central Chile (the provinces of Ñuble and Malleco).

**TIME OF FLIGHT:** November and January.

**REMARKS:** One specimen and one genitalic dissection have been studied.

My identification is based on the photograph of the holotype and two paratype females (figs.

8-10) given by Heimlich. He did not have any males, and he does not mention anything about the female genitalic structures.

#### GENUS *SALPIS* MABILLE

*Salpis* MABILLE, 1885, p. 65; "1891" [1888], p. Div. 22; 1889, p. 154. PROUT, 1910, p. 319.

*Salpis* (*Salpis*): PROUT, 1910, p. 320.

*Salpis* (*Microdontopera*) PROUT, 1910, p. 320. New synonymy.

*Salpis* (*Antygophanes*) PROUT, 1910, p. 320. New synonymy.

*Lasiops* WARREN, 1895, p. 143 (*nec* Holmgren, 1856).

*Pseudosalpis* STAUDINGER, "1898" [1899], p. 82. PROUT, 1910, p. 319 (synonymy).

**DIAGNOSIS:** This genus can be recognized by the thorax having the collar and patagia of very long, hairlike scales, those from the patagia extending over the anterior portion of the abdomen; the thorax does not have posterior tufts.

Head, front varying from almost flat to swollen; palpi with third segment long and slender, equal to two-thirds to all of length of eye; antennae of male simple, fasciculate or bipectinate, the pectinations extending to apex, or nearly so; antennae of female simple, serrate, or shortly bipectinate. Thorax covered dorsally with very long hairlike scales, in some species mixed with spatulate scales; patagia very long, extending over basal portion of abdomen; metathoracic tufts absent; hind tibia of male with or without hair pencil. Abdomen without dorsal tufts; ventral surface of third segment of male with or without row of setae. Wings varying from short and triangular to elongate and slender; forewings with outer margin rounded, or with apex produced and middle of wing strongly bulging; outer margins of all wings smooth, weakly dentate, or strongly dentate; forewing with or without areole; hind wing with Sc approximate to R for about one-half of length of cell.

**MALE GENITALIA:** Uncus elongate; socius small to moderate; gnathos V-shaped, with median area small, rounded, hooked, or weakly spinose; valves simple, or with process from outer portion; anellus with small- to moderate-sized structures; cristae present or absent; vesica a simple tube, armed with several slender spines, some species with median, deciduous, semi-circular band of fine setae.

**FEMALE GENITALIA:** Ovipositor lobes with apophyses attached medially or mediodorsally; sterigma variable, simple or with well-defined

lamella antevaginalis and lamella postvaginalis; ductus bursae short, either well defined or not; ductus seminalis either arising ventrally, dorsally, or on right side; corpus bursae varying from large, elongate, and slender to short and broad; signum present (absent in one species).

**EARLY STAGES:** Apparently undescribed, although at least two species (*eudora* Prout and *tumida*, new species) have been collected as pupae, both found under rocks.

**TYPE SPECIES:** For *Salpis* Mabille: *Salpis antennata* Mabille; designated by Prout, 1910, p. 320. For *Lasiops* Warren (*nec* Holmgren): *Colotois chilendaria* C. Felder, R. Felder, and Rogenhofer; by original designation. For *Pseudosalpis* Staudinger: *Salpis albipunctaria* Mabille; herein designated by me. For *Salpis* (*Microdontopera*) Prout: *Colotois chilendaria* C. Felder, R. Felder, and Rogenhofer; Prout proposed *Microdontopera* to take the place of the pre-occupied *Lasiops*, therefore both must have the same type species. For *Salpis* (*Antygophanes*) Prout: *Salpis* (*Antygophanes*) *orbifera* Prout; sole included species.

**DISTRIBUTION:** The majority of species (25 in number) are found in Chile, occurring in the Andes Mountains, the central valley, and the coastal areas. One species is known from the Andes Mountains of Bolivia, 12 from Argentina. A total of five occur in both Chile and Argentina. In Argentina they are known from the Andes, extending southeastward to the southern Atlantic coast, and south to Tierra del Fuego.

Prout (1910) is the only other person who has done any revisionary work on *Salpis*. He re-defined the genus, divided it into three subgenera, discussed some of the species, and described four new species. He used the following subgenera: *Salpis* (*Salpis*) Mabille, characterized by very long antennae, in the male either simple or ciliated, a long terminal joint of the palpus, and rather broad forewings, the apex not being produced; six species were included. *Salpis* (*Microdontopera*) Prout, characterized by moderately long antennae, in the male bipectinate, a long terminal joint of the palpus, and forewings not broad but with the apex acutely produced; four species were included. *Salpis* (*Antygophanes*) Prout, characterized by the male antennae being very shortly pectinate, the terminal joint of the palpus of moderate length, a very long abdomen, and narrow forewings; only one species was included. Prout did not use any genitalic



structures in his work.

I divide the genus into four groups, based primarily on the male genitalia. They may be summarized as follows: Group I: the exserted vesica extends at between a 45- and 90-degree angle to the aedeagus, the valves are simple, and the moths have gray or brownish gray forewings with contrastingly colored white or whitish gray hind wings; 14 species are included. Group II: the exserted vesica extends at almost a right angle to the aedeagus, the valves are simple and have a narrowed base, and the moths have concolorous brown or grayish brown wings; three species are included. Group III: the exserted vesica extends at between a 45- and 90-degree angle to the aedeagus, each valve has a finger-like process arising from its outer portion, and the adults have concolorous brown wings; nine species are included. Group IV: the exserted vesica continues in the same direction as the aedeagus (or very nearly so), the valves are simple, and the moths have concolorous brown or gray wings; seven species are included.

There is not too much agreement as to the placement of the species in groups between Prout's system and mine. Prout's subgenus *Salpis* included species that go into three of my groups (one in group II, three in III, and two in IV); his five species of *Microdontopera* all go into group I; and his single species of *Antygophanes* is placed in group III.

Prout included 13 species in *Salpis*, two of which he was not acquainted with, hence he did not place them in subgenera. The genus has now been expanded to include 33 species, 19 of which are described as new in the present revision. Only one species has been described in the intervening years, and that was by Sperry (1951).

Work in this genus has been complicated by a lack of specimens. Of the 33 species now recognized as belonging in *Salpis*, only 16 are known from both sexes. Many species are represented by only a few specimens; some apparently have been collected only once and may date back nearly one hundred years. Much collecting and intensive field work is needed before a complete picture of this genus can be obtained. Because of the lack of adequate material, a key to the adults based on maculation and external morphological structures is not given. Keys have been prepared for separating the species by means of both the male and female genitalia, even though these obviously have to be rather incomplete.

## KEY TO SPECIES

### BASED ON MALE GENITALIA AND SECONDARY SEXUAL CHARACTERS<sup>1</sup>

1. Each valve with elongate process or thick spines arising from inner face near distal end (group III) . . . . . 12  
Valves without such a process . . . . . 2
- 2(1). Aedeagus with exserted vesica extending at 45- to 90-degree angle to aedeagus . . . 3  
Aedeagus with exserted vesica continuing in same direction as aedeagus, or nearly so (group IV) . . . . . 18
- 3(2). Abdomen with row of setae on ventral surface of third segment (group II) . . . . . 10  
Abdomen without row of setae on third abdominal segment (group I) . . . . . 4
- 4(3). Valve with apex sclerotized, pointed, and with concave costal area basad of apex . 5  
Valve not as above . . . . . 6
- 5(4). Aedeagus 3.1 mm. in length; exserted vesica extending at 90° angle to aedeagus . . . . . *eudora*  
Aedeagus 2.7 mm. in length; exserted vesica extending at about 45° angle to aedeagus . . . . . *felderi*
- 6(4). Valve with costa very broadly swollen apically, becoming about four times as wide as narrowest part of costa . . . . . *tumida*  
Valve not as above . . . . . 7
- 7(6). Paired structures of anellus small, 0.4 to 0.6 mm. in length . . . . . 8  
Paired structures of anellus large, prominent, 0.8 to 1.0 mm. in length . . . . . 9
- 8(7). Valves of approximately even width to apex . . . . . *dentilineata*  
Valves with base almost twice as wide as apical portion . . . . . *virgata*
- 9(7). Valve with apical region bluntly pointed; aedeagus 1.8 to 2.3 mm. in length . . . . . *mutabilis*  
Valve with apical region rounded; aedeagus 2.5 to 2.6 mm. in length . . . *chilenaria*
- 10(3). Uncus swollen apically, being about twice as wide as median portion . . . . . *falcata*  
Uncus not noticeably swollen apically . 11
- 11(10). Uncus very long and slender, 1.3 mm. in length . . . . . *infelix*  
Uncus shorter, 0.8 to 1.0 mm. in length . . . . . *unda*
- 12(1). Processes of anellus swollen, broad, flattened . . . . . 13  
Processes of anellus not swollen, slender, round . . . . . 15
- 13(12). Processes of anellus evenly tapering to pointed apex . . . . . 14

<sup>1</sup>The males of the following species are unknown: *batiola*, *crepera*, *gutta*, *inornata*, *lata*, *sticta*, *tessera* (all group I), and *unica* (group III)

- Processes of anellus widest medially, outer margin irregularly dentate, and apex curved . . . . . *scodionata*
- 14(13). Anellus with posterior median projection tapering to sharp point, in length as long as processes of anellus . . . . . *lancea*
- Anellus with posterior median projection rounded apically, extending two-thirds of length of processes of anellus . . . . . *rubens*
- 15(12). Apex of each valve pointed; valvular processes angled distally . . . . . *orbifera*
- Apex of each valve rounded; valvular processes straight . . . . . 16
- 16(15). Anellus with simple sagittate sclerotized posterior projection . . . . . 17
- Anellus with posterior projection having broad lateral shoulder-like processes, their length equal to length of projection itself . . . . . *puechi*
- 17(16). Aedeagus equal in length to combined lengths of tegumen and saccus . *carneitincta*
- Aedeagus longer than length of tegumen and saccus combined . . . . . *albipunctaria*
- 18(2). Abdomen with ventral surface of third segment without row of setae . . . . . 19
- Abdomen with ventral surface of third segment with either row of setae or with lateral patches of setae . . . . . 21
- 19(18). Gnathos U-shaped, with rounded median projection strongly dentate . . . . . *penai*
- Gnathos V-shaped, with elongate, smoothly sclerotized, median projection . . . . . 20
- 20(19). Aedeagus 2.6 to 2.8 mm. in length . . . *glabra*
- Aedeagus 3.5 to 3.7 mm. in length . . . *clarkei*
- 21(18). Valve with outer portion bearing rounded swelling or low tubercle, 0.3 to 0.5 mm. in length . . . . . 22
- Valve with outer portion bearing short, well-defined tubercle, about 0.2 mm. in length . . . . . *tubercata*
- 22(21). Uncus 1.7 mm. in length; valve with outer portion bearing slightly raised, rounded swelling, 0.5 mm. in length . . . . . *occulta*
- Uncus 1.5 mm. in length; valve with outer portion bearing low tubercle, 0.3 mm. in length . . . . . 23
- 23(22). Valve with swollen, spinose tubercle 0.3 to 0.4 mm. in length; paired structures of anellus 1.1 to 1.3 mm. long . . . . . *antennata*
- Valve with swollen, spinose tubercle 0.5 to 0.6 mm. in length; paired structures of anellus 1.3 to 1.4 mm. long . . . . . *aenea*

KEY TO FEMALE GENITALIA<sup>1</sup>

1. Apophyses posteriores 5.1 to 5.6 mm. in

<sup>1</sup>The females of *albipunctaria*, *brevis*, *dentilineata*, *eudora*, *felderi*, *orbifera*, *puechi*, *rubens*, *scodionata*, and *virgata* are unknown.

- length . . . . . *falcata*
- Apophyses posteriores 1.3 to 3.5 mm. in length . . . . . 2
- 2(1). Corpus bursae with signum . . . . . 3
- Corpus bursae without signum . . . . . *unica*
- 3(2). Corpus bursae with posterior end enlarged to about double that of width of central portion . . . . . 4
- Corpus bursae with posterior end not enlarged . . . . . 8
- 4(3). Corpus bursae with posterior end enlarged on right side . . . . . 5
- Corpus bursae with posterior end enlarged on both sides . . . . . *batiola*
- 5(4). Ductus seminalis arising from posterior, slender, digitate process . . . . . *gutta*
- Ductus seminalis arising from broad extension of corpus bursae . . . . . 6
- 6(5). Ductus seminalis arising from broad extension on right side of corpus bursae . . . 7
- Ductus seminalis arising from broad quadrate ventral extension of corpus bursae . . . . . *tessera*
- 7(6). Sterigma with posterior margin of weakly sclerotized lamella antevaginalis evenly rounded except for slight median indentation . . . . . *inornata*
- Sterigma with posterior margin of more heavily sclerotized lamella antevaginalis with both broad median indentation and with lateral indentations . . . . . *tumida*
- 8(3). Lamella antevaginalis very slender, not exceeding 0.2 mm. in width . . . . . 9
- Lamella antevaginalis much wider . . . . . 11
- 9(8). Apophyses posteriores 1.5 mm. in length . . . . . *unda*
- Apophyses posteriores 2.4 to 2.8 mm. in length . . . . . 10
- 10(9). Lamella antevaginalis in form of U-shaped rod scarcely thicker than apophyses anteriores . . . . . *infelix*
- Lamella antevaginalis 0.2 mm. in width, and interrupted medially . . . . . *glabra*
- 11(8). Lamella antevaginalis elliptical, not much wider than distinct, separate ductus bursae; latter subtriangular, with sharply raised transverse ridges . . . . . *unica*
- Lamella antevaginalis and ductus bursae not as above . . . . . 12
- 12(11). Lamella antevaginalis subtriangular, with wide anterior base . . . . . 13
- Lamella antevaginalis not as above . . . . . 14
- 13(12). Apophyses posteriores 2.6 to 3.5 mm. in length . . . . . *clarkei*
- Apophyses posteriores 2.1 mm. in length . . . . . *occulta*

- 14(12). Lamella antevaginalis large, winglike, with deep median incision . . . . . 20  
 Lamella antevaginalis not as above . . . . . 15
- 15(14). Lamella antevaginalis heavily sclerotized, wide, variously dentate posteriorly and laterally . . . . . 16  
 Lamella antevaginalis weakly sclerotized, narrow except for slightly more heavily sclerotized lateral points . . . . . *penai*
- 16(15). Corpus bursae with sclerotized posterior portion as long as, or longer than, anterior membranous part . . . . . 17  
 Corpus bursae with sclerotized posterior portion about one-third of length of anterior membranous part . . . . . 19
- 17(16). Corpus bursae with maximum width of posterior sclerotized section 0.6 mm. . . . . *mutabilis*  
 Corpus bursae with maximum width of posterior sclerotized section 1.2 mm. . . . . 18
- 18(17). Lamella antevaginalis with posterior margin dentate laterally . . . . . *crepera*  
 Lamella antevaginalis with very long, lateral finger-like projections . . . . . *lata*
- 19(16). Lamella antevaginalis with more or less straight posterior margin having undulations and lateral points . . . . . *chilenaria*  
 Lamella antevaginalis with smoothly rounded posterior margin having median indentation only . . . . . *carneitincta*
- 20(14). Ductus bursae not clearly differentiated . . . . . 21  
 Ductus bursae separate, subtriangular in outline . . . . . 22
- 21(20). Corpus bursae short, about 4.0 mm. long . . . . . *lancea*  
 Corpus bursae very long, about 7.5 mm. long . . . . . *tuberala*
- 22(21). Lamella antevaginalis with triangular-shaped lateral plates, with V-shaped incision between them . . . . . *antennata*  
 Lamella antevaginalis with rectangular-shaped lateral plates, with deep U-shaped incision between them . . . . . *aenea*

### GROUP I

The male moths of this group have genitalia in which the exerted vesica (insofar as known) extends at between a 45- and 90-degree angle to the aedeagus. All species have simple valves. The processes of the anellus are sclerotized and apically pointed; they vary from being tapered to having a broad, sometimes dentate, postero-dorsal margin. The anellus is variable in shape but each species has a central anterior ridge; the posteromedian area varies from being bluntly pointed to having a small extension.

The female genitalia are relatively simple. The

sclerotized lamella antevaginalis varies from being narrow to a broad plate with lateral posteriorly projecting protuberances; most species lack the lamella postvaginalis. The ductus bursae is more or less distinct and separate. The ductus seminalis arises on the right side if the posterior end of the corpus bursae is asymmetrical, or ventrally if the latter is symmetrical. The corpus bursae varies in length from being relatively short to elongate. The signum increases in size with an increase in size of the corpus bursae; in the small-sized species it is situated either on the right or left sides, whereas in the largest species it is in the dorsal or ventral wall of the corpus bursae.

The moths are usually moderate in size, with the length of the forewings varying from 15 to 18 mm. in the males, and from 16 to 21 mm. in the females. They have gray or brownish gray forewings, the apices of which are pointed or attenuate; the hind wings are white or whitish gray, and contrast in color with the forewings. The antennae of the males are pectinate; those of the females may be shortly pectinate, serrate, or simple. The males lack both the hair pencil on the hind tibia and the row of setae on the ventral surface of the third abdominal segment.

Of the 14 species that are included in this group, only four are known from both sexes, and one of these is lacking an abdomen so that the genitalia cannot be studied. Descriptions are given for seven males and for 10 females. Much collecting and study needs to be done on these species, and this work will perhaps require a modification of the definition of the group.

The following species are included: *dentilineata*, *gutta*, *inornatus*, *tumida*, *tessera*, *batiola*, *sticte*, *virgata*, *mutabilis*, *chilenaria*, *crepera*, *lata*, *eudora*, and *felderi*.

### **Salpis dentilineata** (Butler)

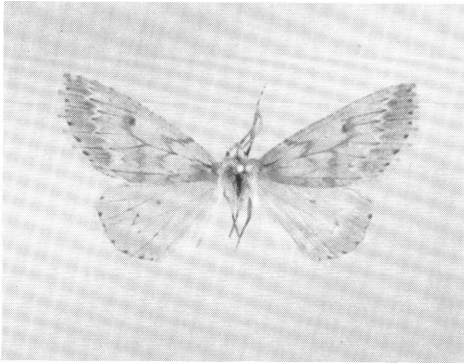
Figures 12, 26

*Monoctenia dentilineata* BUTLER, 1882, p. 358, pl. 16, fig. 12.

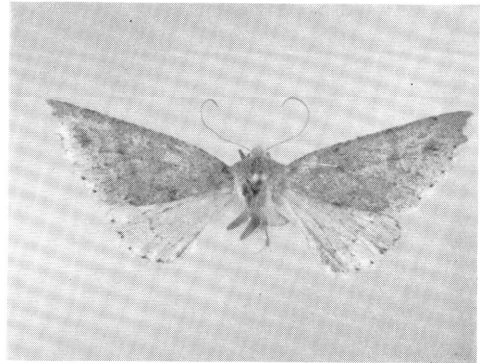
*Salpis* (*Microdontopera*) *dentilineata*: PROUT, 1910, p. 320.

DIAGNOSIS: This species can be recognized by the pale brownish gray forewings with distinct cross lines, the wings becoming darker beyond the dentate t. p. line. The antennae of the male are pectinate, and those of the female, shortly pectinate.

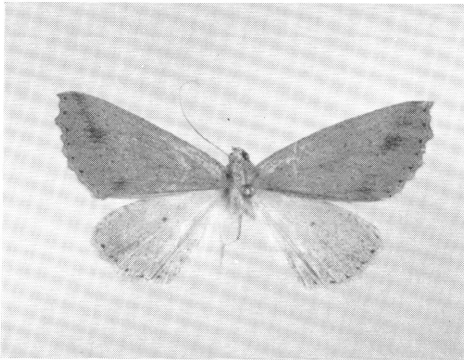
MALE: Head with vertex covered with elongate



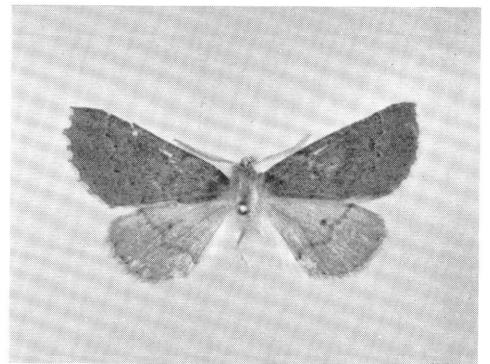
12



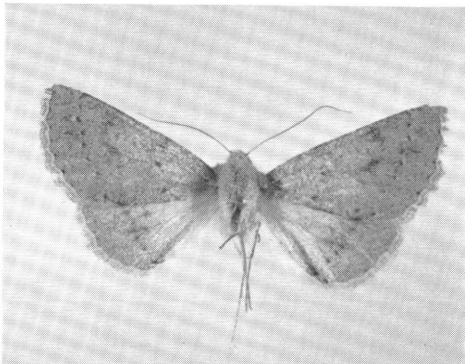
13



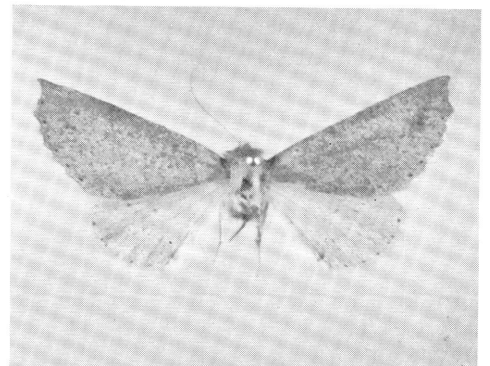
14



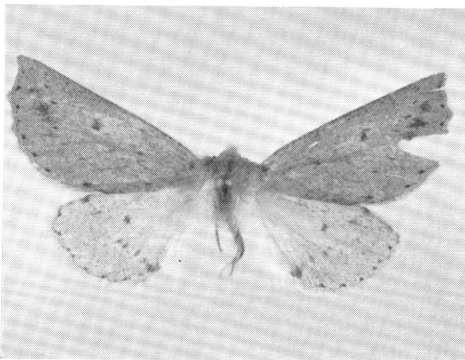
15



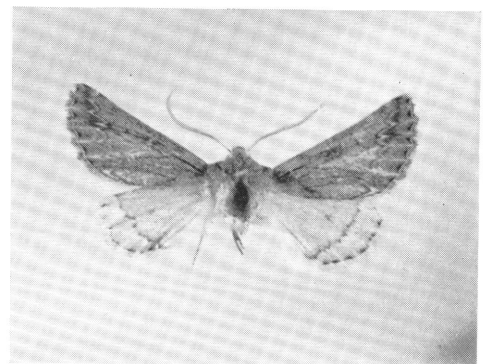
16



17



18



19

white and grayish white scales, extending out over front; front practically flat, brownish gray dorsally, becoming white ventrally; palpi white, with some grayish brown scaling on outer portion; antennae with longest pectinations about 0.4 mm. in length. Thorax white above, with some grayish brown scaling anteriorly; whitish below; legs white, with tarsi more or less brown.

WINGS: Forewings with pointed apex and rounded outer margin; hind wings with evenly rounded outer margin.

UPPER SURFACE OF WINGS: Forewings pale grayish white, more or less evenly overlain with grayish brown or pale brown scales, especially beyond t. p. line, and with cross lines present; basal line represented by dark brown scales on radial vein and by pale brown scaling in cubital cell; t. a. line brown or grayish brown, arising one-fourth of distance from base, crossing radial vein, then proceeding sharply outward in cell, acutely angled basally to cubital vein, then broadly rounded in cubital cell, with point on anal vein; discal spot brownish black; median line broad, brown or grayish brown, weakly represented anteriorly, curving around discal spot then proceeding at right angle to inner margin; t. p. line white, complete, strongly outwardly dentate on veins; terminal area darker than remainder of wing; terminal line consisting of blackish brown intravenular dots; fringe white, darkened at vein endings. Hind wings white, becoming pale grayish brown distally; discal spot brown, small; without cross lines except for complete, dentate, extradiscal line, pale brown, becoming thickened and darker brown on veins, and followed by white shade line; terminal line and fringe as on forewings.

UNDER SURFACE OF WINGS: White; forewings with some grayish brown scaling along costa and near apex, and without maculation except for blackish brown discal spot, minute brown dots on veins representing t. p. line, and blackish brown intravenular spots at margin; hind wings

with a few scattered brown scales, and with maculation similar to that of forewings but less strongly represented.

LENGTH OF FOREWING: 16 mm.

FEMALE: Head and thorax similar to those of male but having more brown scaling; antennae shortly pectinate, with longest pectinations about 0.2 mm. in length.

UPPER SURFACE OF WINGS: Apparently similar to that of male, as far as can be told from the single, worn specimen; hind wings whiter, due to fewer grayish brown scales.

UNDER SURFACE OF WINGS: Similar to that of male.

LENGTH OF FOREWING: 18 mm.

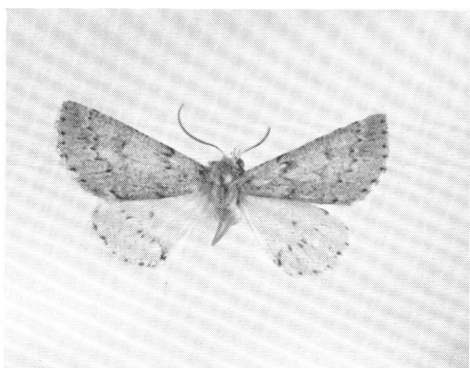
MALE GENITALIA: Uncus 0.7 mm. in length, basal one-half tapering, posterior one-half of even width, apex with ventrally directed spine; socius of moderate length; gnathos slender, with elongate, pointed median area bearing four erect serrate teeth; valve with costa evenly curved, very weakly swollen apically on left valve, with small basal membranous area at base of valve, and with longitudinal area of setae extending along most of inner face of valve; anellus relatively small, anterior margins slightly longer than posterior ones, and with small median ridge extending part way across anellus, becoming widened posteriorly; paired structures of anellus 0.45 mm. in length, with enlarged, flattened bases, extending ventrally and posteriorly and becoming narrowed and more heavily sclerotized, with apical region curving posteriorly and having pointed apex; cristae very long; aedeagus 1.4 mm. in length, slightly bent, with bluntly rounded posterior end; vesica with small group of slender spines distally and with eight thicker basal spines.

FEMALE GENITALIA: Unknown (the single specimen examined is without abdomen).

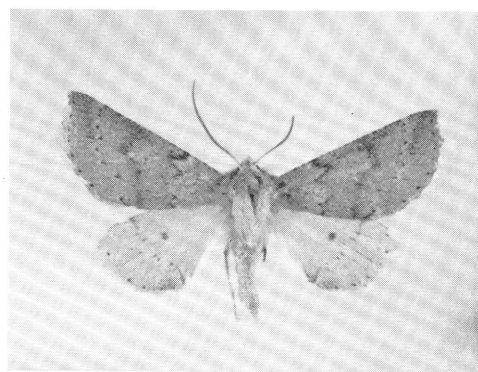
TYPES: Butler had several specimens representing both sexes before him when describing *dentilineata*. The male, with its genitalia mounted by me on Geometridae genitalia slide No. 7502,

FIGS. 12-19. Adults. 12. *Salpis dentilineata* (Butler), male, Coquimbo, [Chile], (B.M.). 13. *Salpis gutta*, new species, holotype female, C. Chile (Schönemann; B.M.). 14. *Salpis inornata*, new species, holotype female, Los Maquis, Coquimbo Province, Chile, March 11-12, 1964 (L. E. Peña; A.M.N.H.). 15. *Salpis tumida*, new species, holotype male, El Alfalfal, Santiago Province, Chile, March, 1968 (L. E. Peña; A.M.N.H.). 16. *Salpis tessera*, new species, holotype female, El Manzano, Santiago Province, Chile, February 10, 1951 (L. E. Peña; C.U.). 17. *Salpis batiola*, new species, holotype female, "Princip," Chile, July, 1899 (Izquierdo; B.M.). 18. *Salpis sticte*, new species, holotype female, El Bolson, Río Negro Province, Argentina, 1961 (A. Kovacs; A.M.N.H.). 19. *Salpis virgata*, new species, holotype male, Rincon Chico, Neuquén Province, Argentina, March 1, 1965 (Schajovskoy; B.M.). All  $\times 1.5$ .

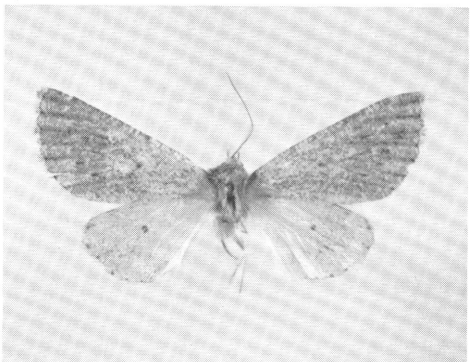




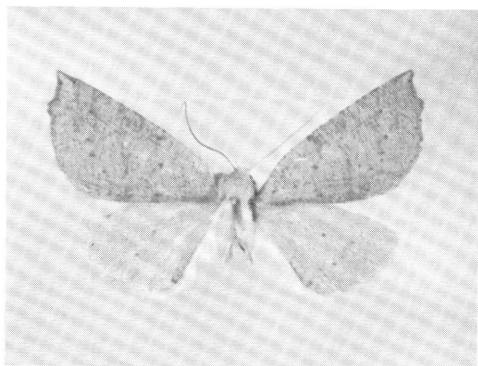
20



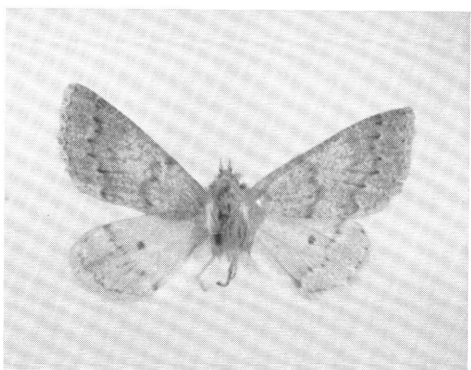
21



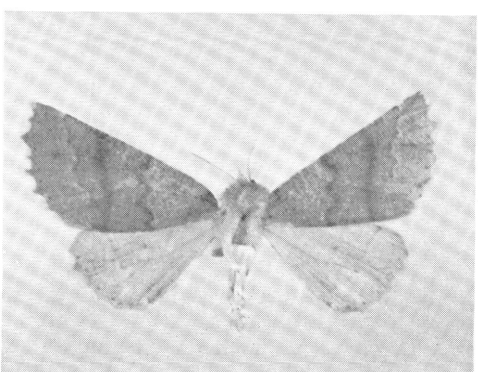
22



23



24



25

FIGS. 20–25. Adults. 20. *Salpis mutabilis*, new species, holotype male, Jardin Botanico, Valparaíso Province, Chile, March 13–14, 1964 (L. E. Peña; A.M.N.H.). 21. *Salpis mutabilis*, new species, paratype male, Guayacan, Santiago Province, Chile, September 21, 1947 (B.M.). 22. *Salpis crepera*, new species, holotype female, Las Hedionditas, Coquimbo Province, Chile, January 11, 1966 (L. E. Peña; A.M.N.H.). 23. *Salpis lata*, new species, holotype female, El Coigo, Curicó Province, Chile, October 1–10, 1960 (L. E. Peña; A.M.N.H.). 24. *Salpis eudora* Prout, paratype male, Puente del Inca, Mendoza Province, Argentina, December 15, 1905 (W. M. Bayne; B.M.). 25. *Salpis felderi* (Butler), female (with male abdomen glued on), Chile (B.M.). All  $\times 1.5$ .

is hereby designated as the lectotype. This specimen is in the collection of the British Museum (Natural History).

**TYPE LOCALITY:** Las Zorras, a small suburb (in the 1880s) of Valparaíso, Valparaíso Province, Chile.

**DISTRIBUTION:** Central Chile, being known from the provinces of Valparaíso and Coquimbo.

**TIME OF FLIGHT:** Unknown.

**REMARKS:** Two specimens (one male and one female) and two genitalic dissections (both males, one being the lectotype) have been studied.

***Salpis gutta*, new species**  
Figures 13, 33

**DIAGNOSIS:** This species has elongate, pale gray forewings with rather poorly defined cross

lines, and a small dark spot near the apex. The female has serrate antennae, as compared with the shortly pectinate antennae of *dentilineata*.

MALE: Unknown.

FEMALE: Head with vertex whitish gray; front flat, narrowly brownish gray dorsally, becoming white ventrally; palpi rising to middle of eye, white, with some grayish brown scaling on outer portion; antennae serrate. Thorax whitish gray above, with anterior portion grayish white; grayish white below; legs brown, or white with brown scaling. Abdomen whitish gray above and below, with scattered brown scales.

WINGS: Forewings attenuate, with pointed apex and with outer margin weakly concave below apex; hind wings with weakly scalloped outer margin.

UPPER SURFACE OF WINGS: Forewings pale grayish white, with scattered pale grayish brown scales, and with cross lines weakly represented; basal line absent; t. a. line arising on costa about one-fourth of distance from base, crossing radial vein, extending outward in cell, acutely angled basally to cubital vein, then broadly rounded in cubital cell, with point on anal vein; discal spot minute; median line nebulous, gently curving around discal spot, then extending more or less straight to inner margin; t. p. line brown, narrow, dentate, complete, and followed by narrow white shade band; terminal area concolorous with remainder of wing, except for dark spot in cells  $M_1$  and  $M_2$ ; terminal line partially represented, and with blackish brown intravenular spots; fringe concolorous with wing. Hind wings white, with scattered grayish brown scales; discal spot very small or obsolescent; without cross lines except for slender extradiscal line, brown, straight except for convex segment in lower portion of wing; terminal line and fringe as on forewings.

UNDER SURFACE OF WINGS: White, with scattered brown scales; without maculation except for minute discal spots and small brown spots on veins representing t. p. and extradiscal lines, and for blackish brown intravenular spots at margin.

LENGTH OF FOREWING: 18 to 20 mm.; holotype, 18 mm.

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Sterigma with elongate, transverse lamella antevaginalis, posterior margin with broad, shallow, median indentation, with single or paired, posteriorly pointing pro-

jections on each side, and with anterolateral margins attenuate and extending to apophyses anteriores; ductus bursae subtriangular, tapering anteriorly, much wider than long; ductus seminalis anteriorly directed, arising on right side posteriorly on corpus bursae; latter with asymmetrical posterior portion, broadly swollen at junction with ductus bursae, median area with left side extending straight anteriorly and right side concave, with longitudinal striations, and with elongate, swollen, anterior portion; signum 0.2 to 0.4 mm. in length, situated ventrally or on right side, with small circular central portion and anterior extension, and having irregular outer margin; apophyses posteriores 1.3 to 1.8 mm. in length.

TYPES: Holotype, female, "C. Chile (Cauquenes?) Schönemann," May 18, 1900; Cauquenes is in Maule Province. The genitalia of the holotype have been mounted by me on Geometridae genitalia slide No. 7522. Paratypes: Chile, one female; no data, one female.

The holotype and one paratype are in the collection of the British Museum (Natural History); the second paratype is in the United States National Museum.

DISTRIBUTION: Central Chile, presumably from Maule Province.

TIME OF FLIGHT: The single dated specimen is labeled May.

REMARKS: Three specimens and three genitalic dissections have been studied.

### ***Salpis inornata*, new species**

Figures 14, 34

DIAGNOSIS: This species can be recognized by the upper surface of the forewings being a unicolorous gray, without cross lines but with some dark spots along the course of the t. p. line. The female has weakly serrate antennae.

MALE: Unknown.

FEMALE: Head with vertex white, with some dark brown scaling; front rising to top of eye, whitish gray, darker above; palpi white, with some grayish white and blackish brown scaling; antennae very weakly serrate. Thorax grayish white above; paler below; legs white, with variable number of dark brown and grayish brown scales. Abdomen whitish gray above and below, with scattered grayish brown and dark brown scales.

WINGS: Forewings relatively broad, with

pointed apex and with outer margin weakly scalloped; hind wings with scarcely scalloped outer margin.

**UPPER SURFACE OF WINGS:** Forewings unicolorous light gray, with scattered dark grayish brown scales, and with cross lines and discal spot absent; outer portion of wing with dark gray spot in cells  $M_1$  and  $M_2$ , another above inner margin near inner angle, plus nebulous dark gray line from costa near apex to upper spot; terminal line black, partially represented, one scale wide, and having intravenular spots; fringe with basal portion concolorous with wing, outer portion narrowly whitish gray. Hind wings white, with scattered grayish brown scales in outer part of wing; discal spot small; with very faint indication of extradiscal line; fringe as on forewings.

**UNDER SURFACE OF WINGS:** Forewings whitish gray, with scattered gray and grayish brown scales; hind wings white, with a few grayish brown and dark brown scales; without maculation except for discal dots on hind wings, and for faint, nebulous, slightly darker band near outer margin of forewings; terminal line on forewings complete, on hind wings obsolescent.

**LENGTH OF FOREWING:** 16 to 18 mm.; holotype, 18 mm.

**MALE GENITALIA:** Unknown.

**FEMALE GENITALIA:** Sterigma with elongate, transverse, lightly sclerotized lamella antevaginalis, posterior margin evenly rounded except for slight median indentation, with anterolateral margins extending to apophyses anteriores, and without lamella postvaginalis; ductus bursae very short, much wider than long; ductus seminalis arising from anteriorly directed tube on right side posterior to corpus bursae; latter with asymmetrical posterior portion, broadly swollen and lightly sclerotized at junction with ductus bursae, terminating in narrow tube on right side, left side tapering anteriorly and having a few longitudinal striations, and with large, membranous, swollen anterior portion; signum 0.2 mm. in length, situated ventrally, with circular central portion and anterior extension, inner face with ridges and with irregular outer margin; apophyses posteriores 1.5 to 1.6 mm. in length.

**TYPE:** Holotype, female, Los Maquis, Quilimari, in coastal area of southern Coquimbo Province, Chile, March 11–12, 1964 (L. E. Peña). The genitalia of the type are mounted on

slide F.H.R. No. 13141. Paratype: Same data as holotype, one female.

Both type specimens are in the collection of the American Museum of Natural History.

**DISTRIBUTION:** Chile (southern Coquimbo Province).

**TIME OF FLIGHT:** March.

**REMARKS:** Two specimens and two genitalic dissections have been studied. This moth is similar to *gutta*, but it can be separated from that species by the longer palpi, the shorter and broader forewings that are a darker and more immaculate gray. The female genitalia of the two species are quite similar, but those of the present species have a simpler and more rounded lamella postvaginalis, a posterior pair of lobe-like structures in the corpus bursae where it joins the ductus bursae, and a shorter corpus bursae. This last structure in the present species is 2.7 mm. long, whereas in *gutta* it is from 3.4 to 3.7 mm. long.

***Salpis tumida*, new species**

Figures 15, 27, 35

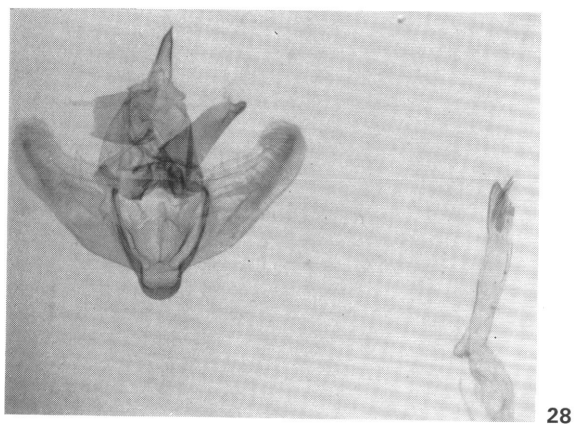
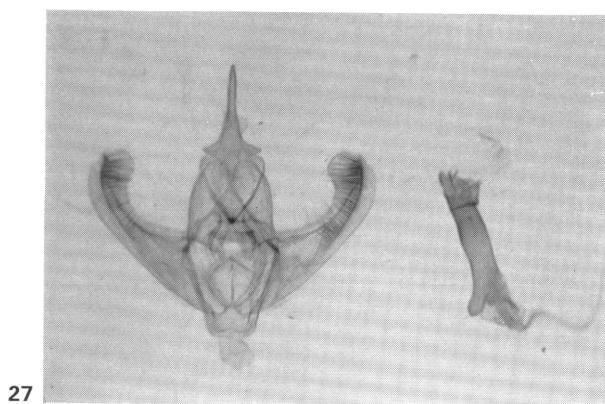
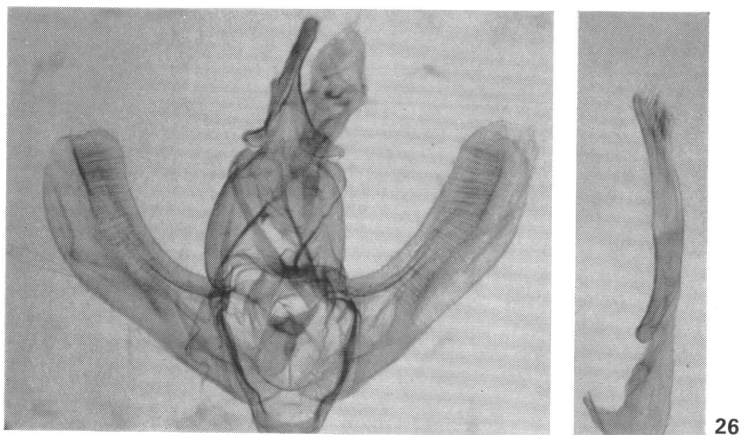
*Salpis* (*Microdontoptera*) *eudora* Prout, 1910, p. 323 (*partim*, female only).

**DIAGNOSIS:** The forewings of this species are pale to dark gray or grayish brown on the upper surface, with rather indistinct cross lines. The antennae of the males are pectinate, and those of the female, weakly serrate. The genitalia of this species are distinctive; their diagnostic characters are given in the keys.

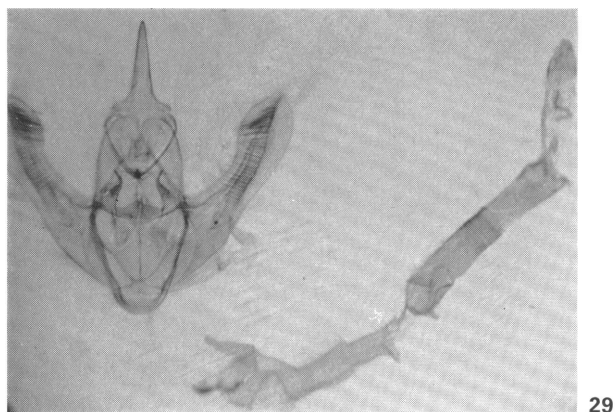
**MALE:** Head with vertex grayish brown; front flat, grayish white to grayish brown; palpi rising to middle of eye, grayish white, with dark brown scaling; antennae with longest pectinations 0.5 mm. in length. Thorax pale to dark gray above; whitish below; legs white, with variable amount of grayish brown and dark gray scaling on outer portions of all legs. Abdomen grayish white or pale gray, with scattered brown and brownish gray scales above; whitish below.

**WINGS:** Forewings with pointed apex, outer margin scalloped, with weak concavity below apex; hind wings with weakly scalloped outer margin.

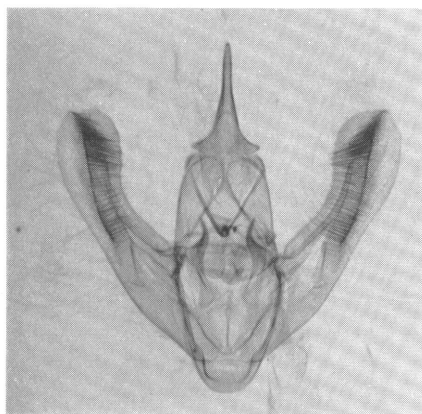
**UPPER SURFACE OF WINGS:** Forewings unicolorous pale to dark gray, with variable amount of brown scaling, and with cross lines varying from obsolescent to clearly represented; basal line absent; t. a. line weakly represented in most specimens, arising on costa one-fourth of distance



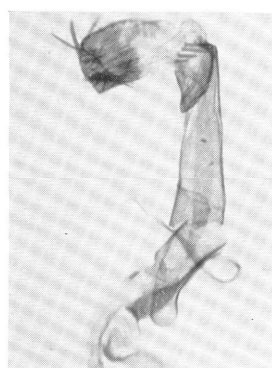
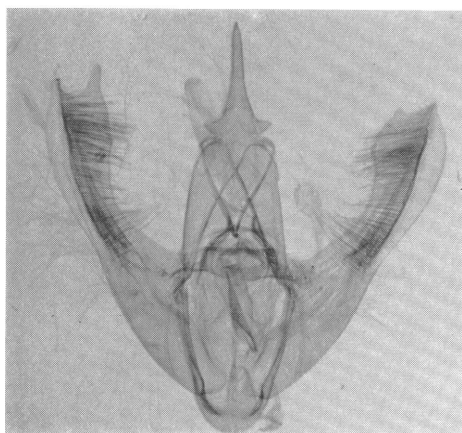
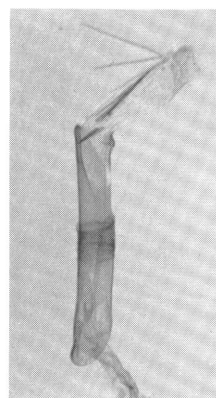
FIGS. 26-28. Male Genitalia. 26. *Salpis dentilineata* (Butler), Coquimbo, [Chile] (B.M.). 27. *Salpis tumida*, new species, paratype, El Alfalfal, Santiago Province, Chile, March, 1968 (L. E. Peña; A.M.N.H.). 28. *Salpis virgata*, new species, holotype, Rincon Chico, Neuquén Province, Argentina, March 1, 1965 (Schajovskoy; B.M.).



29



30



31

FIGS. 29-31. Male Genitalia. 29. *Salpis mutabilis*, new species, holotype, Jardin Botanico, Valparaíso Province, Chile, March 13-14, 1964 (L. E. Peña; A.M.N.H.). 30. *Salpis chilendaria* (C. Felder, R. Felder, and Rogenhofer), Pucatrihue, Osorno Province, Chile, March 26-28, 1968 (L. E. Peña; A.M.N.H.). 31. *Salpis eudora* Prout, paratype, Puente del Inca, Mendoza Province, Argentina, December 15, 1905 (W. M. Bayne; B.M.).



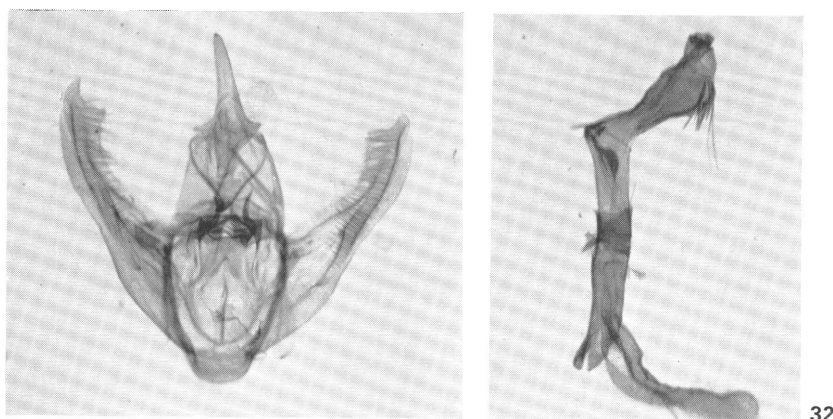


FIG. 32. Male Genitalia. *Salpis felderi* (Butler), Chile (Edmonds (B.M.)).

from base, having outward loops in cells and basal angles on veins; discal spot varying from obsolescent to small; median line nebulous, broad and indistinct in some specimens; t. p. line represented by small brown spots on veins, these more or less connected by paler line, and with faint trace of distal white shade line; terminal line varying from obsolescent to very slender and having brownish black intravenular spots; fringe concolorous with wing. Hind wing white or whitish gray, with numerous grayish brown and dark brown scales, the latter increasing in number distally; discal spot small; extradiscal line complete, somewhat sinuous; terminal line and fringe as on forewings.

**UNDER SURFACE OF WINGS:** Forewings whitish gray, becoming white posteriorly; hind wings white; all wings with discal dots and t. p. and extradiscal lines; terminal line as on upper surface; fringe of forewings grayish brown, becoming white opposite cells, of hind wings concolorous with wing.

**LENGTH OF FOREWING:** 16 to 18 mm.; holotype, 16 mm.

**FEMALE:** Head, thorax, and abdomen similar to those of male but tending to have more dark gray scaling; antennae weakly serrate.

**UPPER SURFACE OF WINGS:** Forewings tending to be darker gray than those of male. Hind wings like those of male.

**UNDER SURFACE OF WINGS:** Similar to that of male.

**LENGTH OF FOREWING:** 16 to 19 mm.; allotype, 19 mm.

**MALE GENITALIA:** Uncus tapering apically, 0.9 to 1.0 mm. in length; socius of moderate

length; gnathos slender, with small, pointed median area bearing several minute teeth; valve with costa strongly swollen distally, with large subtriangular membranous area at base of valve on inner face, and with longitudinal row of heavy setae extending along outer half of valve and terminating in small protuberance on outer margin of valve; anellus relatively small, anterior margins longer than posterior ones, and with medium sclerotized ridge extending almost to posterior point of anellus; paired structures of anellus 0.65 mm. in length, with very broad flattened bases, extending ventrally and posteriorly from posterior margin of base, becoming narrowed and more heavily sclerotized, with apical region curving posteriorly and having pointed apex; cristae very long; aedeagus 1.5 to 1.6 mm. in length, straight, with bluntly rounded posterior end; vesica, when exerted, extending at right angle to aedeagus, basally with four broad spines on one side and two on opposite side, and with incomplete band of spicules or thin spines distally.

**FEMALE GENITALIA:** Sterigma with elongate, transverse lamella antevaginalis, posterior margin with broad, shallow, U-shaped median indentation and with lateral indentation on each side, posterolateral corners angulate, with anterolateral margins attenuate and extending to apophyses anteriores, and without lamella postvaginalis; ductus bursae subrectangular, very short, much wider than long; ductus seminalis arising from anteriorly directed tube on right side posterior of corpus bursae; latter with asymmetrical posterior portion, broadly swollen at junction with ductus bursae, terminating in

narrow tube on right side, left side extending straight anteriorly, lightly sclerotized and with longitudinal striations, and with swollen, membranous anterior portion; signum 0.2 to 0.3 mm. in length, situated dorsally on left side, with circular central portion and anterior extension, inner face with ridges and with irregular outer margin; apophyses posteriores 1.5 to 1.7 mm. in length.

**TYPES:** Holotype, male, El Alfalfal, on Río Colorado, Santiago Province, Chile, March, 1968 (L. E. Peña); female, same data, March 1, 1968. The genitalia of the holotype are mounted on slide F.H.R. No. 15763, and those of the allotype on No. 15778. Paratypes: *Chile*: Same data as types, six males and nine females; Río Colorado, Santiago Province, April 10, 1953 (L. E. Peña), five males and one female; Los Maitenes, Maipo River, Santiago Province, March 2, 1964 (L. E. Peña), one male; Guayaican, Canelo, elevation 900 meters, Santiago Province, March 2-5, 1951 (L. E. Peña), three males and two females; Ocoa, coastal region, Valparaíso Province, April 1, 1962 (L. E. Peña), one male; Marga-Marga, south of Quilpue, Valparaíso Province, March 14-15, 1964 (L. E. Peña), one female; Coquimbo, one male. *Argentina*: Kilometer 168, Transandian Railroad, Mendoza Province, November 3, 1905, bred from pupa under stones (W. M. Bayne), one female.

The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of that institution, of the British Museum (Natural History), and of Cornell University.

**DISTRIBUTION:** Central Chile (the provinces of Coquimbo, Valparaíso and Santiago) and adjacent Argentina (Mendoza Province). The latter locality is quite different ecologically and in altitude from some of the Chilean sites, but apparently the species occurs in both places, as far as can be judged from the present specimens.

**TIME OF FLIGHT:** March and April.

**REMARKS:** Thirty-four adults (19 males and 15 females) and nine genitalic dissections (five males and four females) have been studied.

The single male from Coquimbo is much paler and has the maculation more clearly defined than in the other specimens; it is also apparently older than most of the other moths of this species and its coloration may have faded to some degree.

### ***Salpis tessera*, new species**

Figures 16, 36

**DIAGNOSIS:** This species is similar to *tumida* but the forewings are broader, the upper surface of the wings browner, the outer margin of the wings less scalloped, and the genitalia distinct.

**MALE:** Unknown.

**FEMALE:** Head with vertex grayish brown, with scales more numerous and more elongate than in *tumida*; front grayish brown, becoming paler ventrally; palpi rising to three-fourths diameter of eye, grayish brown, with dark brown and blackish brown scaling; antennae simple. Thorax grayish brown above, somewhat paler below; legs grayish white, with variable number of grayish brown and dark brown scales.

**WINGS:** Forewings broad, with rounded outer margin weakly scalloped; hind wings also with weakly scalloped outer margin.

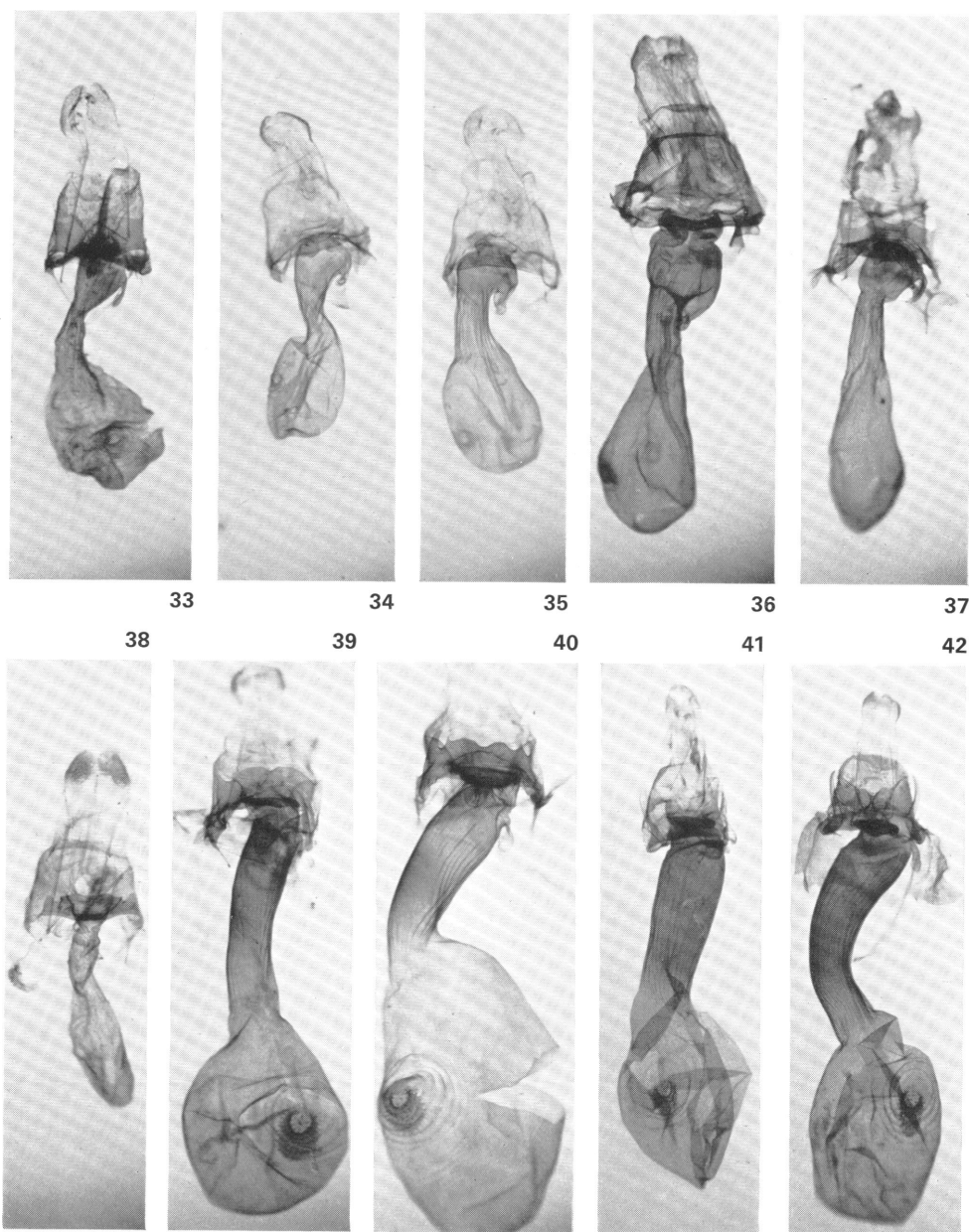
**UPPER SURFACE OF WINGS:** Forewings unicolorous grayish brown, and with cross lines weakly represented; basal line represented by a few blackish brown scales; t. a. line appearing as broad, nebulous spot on costa, and as smaller, blackish brown spots on cubital and anal veins; discal dot minute; median shade line curving around discal dot, then becoming obsolescent; t. p. line represented by small blackish brown spots on veins, shaded distally by white scaling, and with faint trace of connecting line between some of venular spots; terminal line of small intravenular spots; fringe slightly paler than wing. Hind wings grayish white, with numerous grayish brown and gray scales, these latter increasing in number distally; discal spot small; extradiscal line complete, almost straight; terminal line very thin; fringe slightly paler than wing.

**UNDER SURFACE OF WINGS:** Forewings grayish white, with grayish brown and dark brown scaling along costa, below apex, and along outer margin; hind wings white, with numerous grayish brown and dark brown scales; discal dots of forewings absent, of hind wings prominent; t. p. line weakly represented; extradiscal line prominent; terminal line very slender, with some intravenular spots; fringe concolorous with wings.

**LENGTH OF FOREWING:** 19 mm. (holotype).

**MALE GENITALIA:** Unknown.

**FEMALE GENITALIA:** Sterigma with slender, transverse lamella antevaginalis, posterior margin with broad, shallow, bilobed median inden-



FIGS. 33–42. Female Genitalia. 33. *Salpis gutta*, new species, holotype, C. Chile (Schöne-mann; B.M.). 34. *Salpis inornata*, new species, holotype, Los Maquis, Coquimbo Province, Chile, March 11–12, 1964 (L. E. Peña; A.M.N.H.). 35. *Salpis tumida*, new species, paratype, Marga-Marga, Valparaíso Province, Chile, March 14–15, 1964 (L. E. Peña; A.M.N.H.). 36. *Salpis tessera*, new species, holotype, El Manzano, Santiago Province, Chile, February 10, 1951 (L. E. Peña; C.U.). 37. *Salpis batiola*, new species, holotype, "Princip.," Chile, July, 1899 (Izquierdo; B.M.). 38. *Salpis sticte*, new species, holotype, El Bolson, Río Negro Province, Argentina, 1961 (A. Kovacs; A.M.N.H.). 39. *Salpis mutabilis*, new species, allotype, Jardin Botanico, Valparaíso Province, Chile, March 13–14, 1964 (L. E. Peña; A.M.N.H.). 40. *Salpis chilendaria* (C. Felder, R. Felder, and Rogenhofer), El Manzano, Santiago Province, Chile, November 25–28, 1951 (L. E. Peña; C.U.). 41. *Salpis crepera*, new species, holotype, Las Hedionditas, Coquimbo Province, Chile, January 11, 1966 (L. E. Peña; A.M.N.H.). 42. *Salpis lata*, new species, holotype, El Coigo, Curicó Province, Chile, October 1–10, 1960 (L. E. Peña; A.M.N.H.).

tation, and with posterolateral regions tapering; ductus bursae very wide and short, lateral margins rounded; ductus seminalis arising from very wide, almost square posteroventral portion of corpus bursae, with right side broadly extending anteriorly, then tapering to form ductus seminalis; corpus bursae weakly curving to left side anteriorly, having longitudinal striations, and with swollen anterior portion; signum 0.3 mm. in length, situated on left side; apophyses posteriores 1.8 mm. in length.

TYPE: Holotype, female, El Manzano, elevation 2800 meters, Santiago Province, Chile, February 10, 1951 (L. E. Peña). The genitalia of the type are on slide F.H.R. No. 15852.

The type is in the entomological collection of Cornell University, No. 4565.

DISTRIBUTION: Central Chile (Andes Mountains of Santiago Province).

TIME OF FLIGHT: February.

REMARKS: One specimen and one genitalic dissection have been studied. The female genitalia of *tessera* are longer than those of *tumida*; the corpus bursae of the present species is 4.4 mm. in length, whereas that of *tumida* is 2.7 mm. long.

***Salpis batiola*, new species**

Figures 17, 37

DIAGNOSIS: This species is similar to *gutta* and *inornata* in color and maculation, but is slightly larger, and the genitalia are different; see the key for details of the distinguishing characters of the genitalia.

MALE: Unknown.

FEMALE: Head and thorax similar to those of *inornata*; palpi rising to middle of eye; antennae shortly pectinate.

WINGS: Forewings elongate, with pointed apex and with outer margin concave below apex; hind wings with rounded outer margin.

UPPER SURFACE OF WINGS: Forewings unicolorous light gray, with scattered brown scales; cross lines absent or obsolescent, with very faint traces of t. a. and t. p. lines; discal dot absent; faint, nebulous grayish brown spot in cells  $M_1$  and  $M_2$  just distad of t. p. line; terminal line represented by small brownish black intravascular dots; fringe with basal portion concolorous with wing, outer part whitish gray. Hind wings white, with scattered grayish brown scales becoming more numerous in outer part of wing; discal dot very small; extradiscal line faint,

complete, convex below middle of wing; terminal line like that of forewings; fringe white.

UNDER SURFACE OF WINGS: Forewings whitish gray, with scattered grayish brown scales; hind wings white, with a few brown scales; minute discal dots present on all wings; t. p. and extradiscal lines represented by small dark brown dots on veins; terminal line and fringe similar to those of upper surface.

LENGTH OF FOREWING: 19 mm. (holotype).

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Sterigma with elongate, transverse lamella antevaginalis, posterior margin with broad, shallow, median indentation, with wide lateral indentation on each side, posterolateral corners extended as prominent points, with anterolateral margins attenuate and extending toward apophyses anteriores; ductus bursae very short, much wider than long; ductus seminalis arising from anteriorly directed tube on right side posteriorly of corpus bursae; latter with broad, quadrate posterior portion having rounded posterior margin, sharply narrowed medially and then gradually increasing in width anteriorly, and having numerous, weak, longitudinal striations; signum, 0.3 mm. in length, situated on right side; apophyses posteriores 1.8 mm. in length.

TYPE: Holotype, female, "Princip.," Chile, July, 1899 (Izquierdo). The genitalia of this specimen have been mounted by me on Geometridae genitalia slide No. 7506.

The type specimen is in the collection of the British Museum (Natural History).

DISTRIBUTION: Chile. The only word listed in the "Index to map of Hispanic America 1:1,000,000" that is anything like "Princip." is Cerro Principio, a locality near Argentina in Aisén Province.

TIME OF FLIGHT: July.

REMARKS: One specimen and one genitalic dissection have been studied. As this species is so similar to some of the preceding in color and maculation, it is advisable to dissect the genitalia to make certain of its identification. The cup-shaped posterior portion of the corpus bursae is diagnostic for this species.

***Salpis sticte*, new species**

Figures 18, 38

DIAGNOSIS: This species looks like *batiola*, but the upper surface of the wings has discal dots

and more prominent t. p. and extradiscal lines. The genitalia of the two species are distinctive; see the key for the critical characters.

MALE: Unknown.

FEMALE: Head and thorax similar to those of *batiola*; antennae shortly pectinate.

WINGS: Forewings elongate, with pointed apex and outer margin concave below apex, remainder of outer margin of forewings and hind wings weakly scalloped.

UPPER SURFACE OF WINGS: Forewings unicolorous light gray, with scattered brown scales; cross lines absent except for minute brownish black dots on veins representing t. p. line; discal spot prominent, dark; nebulous grayish black area extending from cells  $R_5$  to  $M_2$  distad of t. p. line, more or less interrupted by veins; terminal line black, very narrow, and with intravenular dots; fringe concolorous with wing after very narrow white basal band. Hind wings white, with scattered grayish brown scales becoming more numerous in outer part of wing; discal dot present; extradiscal line represented mainly by venular dots, becoming more prominent above inner margin; terminal line and fringe similar to those of forewing.

UNDER SURFACE OF WINGS: Forewings whitish gray, hind wings white, both with scattered brownish gray scales; discal spots present on all wings; t. p. and extradiscal lines more or less prominent and connecting venular dots; terminal line and fringe similar to those of upper surface.

LENGTH OF FOREWING: 20 mm. (holotype).

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Sterigma with lamella antevaginalis an elongate, transverse structure, with posterior margin widest medially, having shallow, broad indentation on midline and slight lateral points, laterally indented and with lateral lobelike swelling on each side; ductus bursae short, tapering anteriorly; ductus seminalis arising ventrally near posterior end of corpus bursae; latter membranous, becoming slightly swollen anteriorly; signum 0.2 mm. in length, situated laterally; apophyses posteriores 1.8 mm. in length.

TYPE: Holotype, female, El Bolson, Río Negro Province, Argentina, 1961 (A. Kovacs). The genitalia of the type are mounted on slide F.H.R. No. 15760.

The holotype is in the collection of the American Museum of Natural History.

DISTRIBUTION: Argentina (Río Negro Province).

TIME OF FLIGHT: Unknown.

REMARKS: One specimen and one genitalic dissection have been studied. This is the first species in this revision of the genus to have the ductus seminalis arising ventrally from the corpus bursae.

***Salpis virgata*, new species**

Figures 19, 28

DIAGNOSIS: This species has the upper surface of the forewings gray, with brownish gray patches in the center of the wing along the veins. The male has shortly pectinate antennae. See the key for genitalic differences.

MALE: Head with vertex covered with grayish white scales, blackish brown medially; front whitish gray; palpi rising to one-fourth height of eye, whitish gray, with brownish gray and brownish black scales, with first segment long scaled ventrally; antennae with longest pectinations about 0.4 mm. in length. Thorax grayish white above and below; legs whitish, with scattered gray and brown scales, and with brownish gray tarsi having narrow white bands at ends of segments.

WINGS: Forewings with rounded outer margin; all wings with weakly scalloped outer margins.

UPPER SURFACE OF WINGS: Forewings gray, with numerous grayish black scales; pale brown scaling in central portion of wing along veins and extending to outer margin, beginning with  $M_1$ , these areas spreading laterally a short distance, and those along veins Cu and 2A narrowly outlined with black scales; narrow black line parallel with costa in radial cell extending from base of wing to location of absent t. a. line; discal dot very small; median line absent; t. p. line slender, faint, grayish black, strongly outwardly dentate on veins, followed by thin, white shade line, and then by nebulous grayish black shade band in upper portion of wing; terminal line black, thickened intravenularly, and interrupted by veins; fringe pale basally, then concolorous with wing. Hind wings white, evenly suffused with grayish brown scales; discal dot small; extradiscal line grayish black, complete, slightly curved; terminal line and fringe similar to those of forewings.

UNDER SURFACE OF WINGS: Forewings grayish white, with dark gray scaling on wing except for



inner marginal area and on veins; hind wings white, with evenly scattered brownish gray scales; forewings with faint trace of discal dot and t. p. line in upper part of wing; hind wings with prominent discal dot and outwardly dentate extradiscal line; terminal lines and fringes similar to those of upper surface.

LENGTH OF FOREWING: 16 mm. (holotype).

FEMALE: Unknown.

MALE GENITALIA: Uncus broad, short, with terminal section sharply tapered to elongate point, in length 0.8 mm.; socius small; gnathos slender, tapering, with shortly serrate median area; valve with costa concave, with low, longitudinal ridge bearing single row of elongate setae, and with band of thicker setae arising from area along anterodistal margin of valve; anellus with anterior margins longer than posterior ones, with median sclerotized ridge in anterior part of anellus, and with posteromedian projection two-fifths length of anellus; paired structures of anellus 0.6 mm. in length, arising from posterior end of quadrate bases 0.4 mm. long, extending ventrally, weakly narrowing and becoming more heavily sclerotized, with posterior margin variably erose, and with apical region sharply angled posteriorly and having pointed apex; cristae very long; aedeagus 2.0 mm. in length, anterior end slightly curved, and with bluntly pointed posterior end; vesica armed with eight thick and one slender spines.

FEMALE GENITALIA: Unknown.

TYPE: Holotype, male, Rincon Chico, Neuquén Province, Argentina, March 1, 1965 (Schajovskoy). The genitalia of the type are mounted on Geometridae genitalic slide No. 5663.

The unique type is in the collection of the British Museum (Natural History).

DISTRIBUTION: Argentina (Neuquén Province).

TIME OF FLIGHT: March.

REMARKS: One specimen and one genitalic dissection have been studied. This is the only species known that has prominent longitudinal brown scaling on the veins of the forewing.

***Salpis mutabilis*, new species**

Figures 20, 21, 29, 39

*Monoctenia chilendaria* auct.: BUTLER, 1882, p. 358, pl. 16, fig. 13 (male).

DIAGNOSIS: This is a relatively small species with the upper surface of the forewings gray, and

usually having clearly differentiated cross lines. The genitalia are distinctive; see the keys for these characters.

MALE: Head with vertex grayish black dorsally, white ventrally between antennae; front brownish black dorsally, white ventrally; palpi rising to middle of eye, whitish gray, with dark gray and brownish black scaling; antennae with longest pectinations about 0.3 mm. in length. Thorax gray or grayish white above; paler below; legs grayish white, with brownish gray scaling; tarsi brown basally and whitish distally. Abdomen gray above, paler below, with scattered brownish gray and blackish brown scales.

WINGS: Forewings with pointed apex; all wings with outer margins weakly scalloped.

UPPER SURFACE OF WINGS: Forewings unicolorous whitish gray or gray, with variable number of dark gray, grayish brown and blackish brown scales; veins with faint brown scaling in middle of wing; cross lines varying from weakly to strongly represented; base of wing with longitudinal black scaling below cubital vein in some specimens; t. a. line blackish brown, arising on costa one-fourth of distance from base, with two deep loops or angles into cells, inwardly pointing on veins; discal spot small; median shade line obsolescent or weakly represented; t. p. line arising on costa four-fifths of distance from base, subparalleling outer margin to inner margin, being outwardly angled and more strongly represented on veins, concave in cells, and followed by narrow, rather faint, grayish white band; terminal area with nebulous dark scaling from near apex to cell  $M_2$ ; terminal line incomplete, consisting only of black intravenular dots in most specimens; fringe concolorous with wing. Hind wings white, with variable number of dark gray and brownish scales, mostly in outer part of wing; discal spot larger than that of forewing; extradiscal line blackish brown, complete, most strongly represented on veins, and being concave opposite discal spot; terminal line and fringe similar to those of forewing.

UNDER SURFACE OF WINGS: Forewings grayish white, hind wings white, both with scattered grayish black scales; discal spots and outer cross lines present on all wings, with latter often being only venular spots; terminal line represented by intravenular spots; fringe of forewings tending to be dark brown, at least in upper portion of wing.

LENGTH OF FOREWING: 15 to 17 mm.; holotype, 15 mm.

**FEMALE:** Similar to male; antennae simple, becoming weakly serrate in outer portion.

**LENGTH OF FOREWING:** 16 to 17 mm.; allotype, 16 mm.

**MALE GENITALIA:** Uncus relatively short and broad, tapering, 1.0 mm. in length; socius small; gnathos slender, with shortly serrate median area; valve with costa swollen distally, with longitudinal sclerotized band extending length of valve from sacculus to pointed apex, and with row of thick setae arising from area along anterodistal margin of band; anellus small, anterior margins longer than posterior ones, and with median sclerotized ridge extending length of anellus and extending posteriorly distance equal to half the length of anellus; paired structures of anellus 0.8 to 0.9 mm. in length, with very long bases (0.6 to 0.7 mm.) broadened anteriorly, extending ventrally from posterior margin of base and becoming narrowed and more heavily sclerotized, with posterior margin finely setose, and with apical region sharply angled posteriorly and having pointed apex; cristae very long, moderate in number; aedeagus 1.8 to 2.3 mm. in length, straight, with bluntly rounded posterior end; vesica, when exerted, extending at about 45-degree angle to aedeagus, with longitudinal row of eight thick spines, in length about equal to four more spines extending across posterior end of aedeagus, and with distal incomplete band of spinules, being bases of slender, deciduous spines.

**FEMALE GENITALIA:** Sterigma with very wide, sclerotized lamella antevaginalis, posterior margin weakly indented medially and more strongly so laterally, with lateral margins extending anteroposteriorly and terminating as blunt points, with lamella postvaginalis a dorsoventral flange along area of ductus bursae; latter membranous, scarcely definable; ductus seminalis arising ventrally or on right side near posterior end of corpus bursae; latter very long, 2.7 mm. in length, with elongate, slender, weakly striate and lightly sclerotized posterior portion, and with globular anterior portion shorter than posterior part; signum very large, 0.7 mm. in length, situated ventrally, purselike, with posterior opening, and with numerous short spinelike projections dorsally and around margins; apophyses posteriores 1.5 mm. in length.

**TYPES:** Holotype, male, and allotype, female, Jardin Botanico, Quilpue, Valparaíso Province, Chile, March 13–14, 1964 (L. E. Peña). The

genitalia of the holotype are mounted on slide F.H.R. No. 13142, and those of the allotype, on No. 13143. Paratypes, all from Chile: *Valparaíso Province*: "Chile. Edmonds" (these are presumably two of the specimens cited by Butler (1882, p. 358, pl. 16, fig. 13) from Las Zorras, a small suburb of Valparaíso), three males; *Marga-Marga*, south of Quilpue, March 14–15, 1964 (L. E. Peña), one male; no data except "Col. Dr. Reed Valparaíso" (or merely "Reed"), three males. *Santiago Province*: Guayacan, September 19, 1947, three males and one female. *Arauco Province*: Contulmo (Schönemann), one male.

The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of that institution and of the British Museum (Natural History).

**DISTRIBUTION:** Chile (the provinces of Valparaíso, Santiago and Arauco).

**TIME OF FLIGHT:** March and September. Butler (*op. cit.*) quoted Edmonds as saying these moths were taken "at flowers, in February, March, and April."

**REMARKS:** Fourteen specimens (12 males and two females) and eight genitalic dissections (six males and two females) have been studied.

This species is rather variable in color and in the degree of maculation. The oldest specimens (Edmonds and Schönemann) are the palest and have the least maculation; they agree fairly well with Butler's figure, although it shows the forewings to be too attenuate. The Reed specimens, possibly from Valparaíso Province, and the three adults collected by Peña in that province, have the darkest wings and the most clearly defined maculation. The four moths from Santiago Province are somewhat intermediate in color and pattern between the two extremes.

**Salpis chilendaria** (C. Felder, R. Felder, and Rogenhofer)  
Figures 30, 40

*Colotois* ? *chilendaria* C. FELDER, R. FELDER, AND ROGENHOFER, 1874 (1864–1875), pl. 124, fig. 6 (not fig. 7).

*Lasiops chilendaria*: WARREN, 1895, p. 143.

*Salpis* (*Microdontopera*) *chilendaria*: PROUT, 1910, p. 320.

**DIAGNOSIS:** This species is larger than *mutabilis*, and the upper surface of the forewings is usually paler and has more weakly defined maculation than is found in that species.

Genitalic differences are also present; see the keys.

**MALE:** Head with vertex white, with some grayish brown or dark gray scales; front brownish black dorsally, becoming white ventrally; palpi rising to about middle of eye, white or grayish white, with grayish brown and brownish black scaling; antennae with longest pectinations about 0.25 mm. in length. Thorax white or grayish white above; slightly paler below; legs white or grayish white, with scattered brown scaling. Abdomen grayish white above, slightly paler below.

**WINGS:** Forewings with apex pointed and with weak concavity below apex; all wings with outer margins weakly scalloped.

**UPPER SURFACE OF WINGS:** Forewings unicolorous white or grayish white, with evenly scattered brown scales; veins with very faint pale brown scaling in middle of wing; cross lines absent or weakly represented; cubital vein usually with some black scales near base of wing; t. a. line either absent, represented by three costal and venular dots, or narrow and complete; discal dot absent or present; median shade line absent in most specimens; t. p. line represented by small, brown or brownish black spots on veins, in some specimens shaded distally by white scaling; terminal area with nebulous area of grayish brown or brown scaling in cells  $M_1$  and  $M_2$ ; terminal line represented by inconspicuous to prominent brown or black intravenular dots; fringe concolorous with wing. Hind wings white, with pale brown or grayish brown scaling in outer portion of wing; discal dot larger than that of forewings; extradiscal line obsolescent to complete, most strongly represented on veins; terminal intravenular dots smaller than those on forewings; fringe concolorous with wing.

**UNDER SURFACE OF WINGS:** Forewings whitish or pale grayish white, hind wings white, both with scattered brown scales; forewings with obsolescent or weakly represented discal dot and with t. p. line represented by venular dots; hind wings with discal dot and extradiscal line more strongly represented than on forewings; terminal intravenular dots weakly represented; fringe of forewings tending to be brown, at least in upper portion of wing.

**LENGTH OF FOREWING:** 16 to 18 mm.

**FEMALE:** Similar to male, but tending to have upper surface of forewings darker gray; antennae weakly serrate.

**LENGTH OF FOREWING:** 16 to 18 mm.

**MALE GENITALIA:** Similar to those of *mutabilis* but larger, and differing mainly as follows: uncus longer and more slender, 1.1 to 1.2 mm. in length; valve with outer portion of costa enlarged, and with apex rounded; anellus with posterior margin pointed, without posterior extension; paired structures of anellus 1.0 mm. in length, basal section 0.6 mm. long; aedeagus 2.5 to 2.6 mm. in length; vesica with distal section of very long, slender spines, in length about three times as long as spines at posterior end of aedeagus.

**FEMALE GENITALIA:** Similar to those of *mutabilis* but differing mainly as follows: sterigma with slightly wider and more heavily sclerotized lamella antevaginalis, posterior margin more irregular and with longer lateral hooklike processes; corpus bursae with posterior portion shorter, about 2.1 mm. in length, thicker, more heavily sclerotized, and with globular anterior portion longer than posterior part; apophyses posteriores 1.7 to 2.0 mm. in length.

**TYPES:** The holotype (presumably represented on plate 124, fig. 6) is in the collection of the British Museum (Natural History); its genitalia are mounted on slide J.F.G.C. No. 6595 (B.M. No. 1948-92). The female illustrated with the type on plate 124, figure 7, has not been examined; it is thought that this specimen is not conspecific with the holotype, and may well be, as claimed by Butler, the female of his *felderi*.

**TYPE LOCALITY:** Chile.

**DISTRIBUTION:** Chile and Argentina (Neuquén Province). In Chile, the species ranges from the coastal regions (the provinces of Arauco and Osorno) to the Andes (the provinces of Santiago and Curico).

**TIME OF FLIGHT:** March and October. The single specimen caught in March is a badly worn male; the October examples are in much fresher condition.

**REMARKS:** Nine specimens (six males and three females) and seven genitalic dissections (five males, including the holotype, and two females) have been examined.

There is not enough material available to tell whether differences occur between the coastal and Andean populations of this species.

**Salpis crepera**, new species  
Figures 22, 41

**DIAGNOSIS:** This species has forewings that are

broader and darker gray than are those of *chilenaria*. The female antennae of *crepera* are simple. The genitalia of these two species are different; see the key for details.

MALE: Unknown.

FEMALE: Head with vertex pale grayish brown, white between bases of antennae; front blackish brown and long scaled dorsally, pale gray ventrally; palpi very long, rising to near top of eye, gray, with considerable blackish brown scaling; antennae simple. Thorax grayish black above, with terminal portions of hairlike scales grayish white, and with basal part of collar grayish brown; below grayish white; legs grayish white, with dark brownish gray scaling, tarsi brown, with ends of segments paler.

WINGS: Forewings broad, apex pointed, and outer margin rounded; all wings with outer margins weakly crenulate.

UPPER SURFACE OF WINGS: Forewings unicolorous dark gray; veins faintly brownish; maculation absent except for dark dot on cubital vein in middle of wing, and for faint trace of venular dots representing t. p. line; terminal line represented by small intravenular dots; fringe apparently concolorous with wing. Hind wings white, with scattered grayish black scales in outer portion of wing; discal dot present; extradiscal line faintly suggested; terminal line and fringe like those of forewings.

UNDER SURFACE OF WINGS: Forewings grayish white, hind wings white, both with dark gray and brownish black scales; all wings with discal dots and weakly represented outer cross lines, those of forewings more weakly represented, and with terminal intravenular dots; fringe of forewing dark brown.

LENGTH OF FOREWING: 18 mm. (holotype).

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Sterigma with very large, sclerotized lamella antevaginalis, posterior margin with shallow median indentation and with several small points, laterally with two large points on each side, and with lateral margin of lamella somewhat S-shaped; lamella postvaginalis a dorsoventral flange across ductus bursae; latter very short, much wider than long; ductus seminalis arising dorsally from posterior end of corpus bursae and extending to right side as slender, elongate sac, with tube arising medio-dorsally therefrom; corpus bursae very long, with broad, straight, sclerotized posterior portion having a few longitudinal striations dorsally and

around entire structure at junction with membranous, globular anterior portion; signum large, 0.8 mm. in length, situated ventrally, purselike, with posterior opening, and with numerous spinelike projections dorsally and around margins; apophyses posteriores 1.5 mm. in length.

TYPE: Holotype, female, Las Hedionditas, on the road from Juntas to Embalse La Laguna, Coquimbo Province, Chile, January 11, 1966 (L. E. Peña). The genitalia of the holotype are mounted on slide F.H.R. No. 14540.

The holotype is in the collection of the American Museum of Natural History.

DISTRIBUTION: Central Chile (Coquimbo Province).

TIME OF FLIGHT: January.

REMARKS: One specimen and one genitalic dissection have been studied.

The wings of the unique type are somewhat rubbed, hence the description of the maculation will undoubtedly have to be altered when additional specimens come to hand.

The female genitalia of *crepera* differ from those of *chilenaria* by the larger and differently shaped sterigma, and by the straighter, longer, and wider sclerotized posterior portion of the corpus bursae.

#### ***Salpis lata*, new species**

Figures 23, 42

DIAGNOSIS: This is a large, broad winged species with gray forewings. The highly developed female genitalia set it apart from the other species.

MALE: Unknown.

FEMALE: Head with vertex grayish white, long scaled, white between bases of antennae; front brownish black dorsally, white ventrally; palpi rising to middle of eye, white or whitish gray, with some grayish brown scaling laterally; antennae with central portion weakly serrate. Thorax grayish white above; white below; legs white, with brownish gray scaling.

WINGS: Forewings broad, apex pointed, with concavity below apex; outer margins of all wings feebly crenulate.

UPPER SURFACE OF WINGS: Forewings unicolorous pale gray, with scattered grayish brown scales; maculation weak or obsolescent; t. a. line arising on costa about two-fifths of distance from base, crossing wing in two shallow loops; discal dot absent; median shade line more or less medially placed between t. a. and t. p. lines;

latter arising on costa about four-fifths of distance from base, apparently paralleling outer margin, appearing mainly as small venular dots; terminal line obsolescent except for small blackish brown intravenular dots; fringe concolorous with wing. Hind wings white, with scattered pale brownish gray scaling; discal dot small; extradiscal line weakly represented, brownish gray, bordered distally by faint white band; terminal line absent or represented by minute intravenular dots; fringe concolorous with wing.

UNDER SURFACE OF WINGS: Forewings pale grayish white, hind wings white, both with scattered brownish gray scaling; forewings with faint, incomplete t. p. line anteriorly, and without discal dot; hind wings with small discal dot and narrow extradiscal line; terminal line represented by small intravenular dots; fringe of forewing blackish gray, becoming grayish white distally, of hind wing concolorous with wing.

LENGTH OF FOREWING: 19 to 21 mm.; holotype, 19 mm.

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Sterigma with very large, sclerotized lamella antevaginalis, median portion with posterior indentation and paired, longitudinal S-shaped ridges, posterolateral margins terminating in point, and with large, S-shaped lateral structure on each side 1.3 mm. in length; lamella postvaginalis represented by elongate, broad, slightly tapering posteriorly, sclerotized plates; ductus bursae very short, scarcely differentiated; ductus seminalis arising from elongate, membranous sac on right side of posterior portion of corpus bursae; latter very long, with curved, sclerotized, longitudinally striated posterior portion enlarged on right side of junction with ductus bursae, and with globular, membranous anterior portion; signum very long and slender, 1.0 mm. in length, situated dorsally, purselike, with posterior opening, and with numerous spinelike projections ventrally and around margins; apophyses posteriores 1.9 mm. in length.

TYPES: Holotype, female, El Coigo, Cordillera Curicó, Curicó Province, Chile, October 1-10, 1960 (L. E. Peña). The genitalia of the holotype are mounted on slide F.H.R. No. 13137. Paratypes: Alto de Vilches, Cordillera Talca, Talca Province, Chile, October 17-24, 1964 (L. E. Peña), one female.

Both type specimens are in the collection of the American Museum of Natural History.

DISTRIBUTION: Andes Mountains of central Chile (provinces of Curicó and Talca). The holotype was taken in a *Nothofagus* forest at an elevation of from 700 to 1100 meters.

TIME OF FLIGHT: October.

REMARKS: Two specimens and two genitalic dissections have been studied.

The female genitalia of *lata* are characterized by the greater development of the sclerotized area of the sterigma, and by its having the lateral pair of "horns."

The genitalia of the paratype, as compared with the holotype, have shorter and straighter lateral S-shaped structures, a more swollen posterior portion of the corpus bursae on the right side, a somewhat shorter, curved, sclerotized "neck" of that structure, and slightly longer apophyses posteriores.

#### **Salpis eudora** Prout

Figures 24, 31

*Salpis Seudora* Prout, 1910, p. 322 (printer's error).

*Salpis (Microdontoptera) eudora* Prout, 1910, p. 322, pl. 48, fig. 17 (male).

DIAGNOSIS: This is a small-sized species that has the upper surface of the forewings brownish gray and with distinct cross lines. The valves of the male genitalia are quite distinct from any of those of the preceding species; see the key for details.

MALE: Head with vertex brownish gray; front grayish brown; palpi rising to middle of eye, third segment very long, all segments gray with brownish gray scaling; antennae with longest pectinations about 0.2 mm. in length. Thorax grayish brown above, paler below; legs grayish white, with brown scaling, and with tarsi brown, each segment tipped with grayish white.

WINGS: Forewings with apex pointed; all wings with outer margins weakly scalloped.

UPPER SURFACE OF WINGS: Forewings unicolorous brownish gray, with scattered brownish black scales; cross lines brownish black, prominent; t. a. line arising on costa about three-tenths of distance from base, having outward loops in cells and being angled basally and becoming slightly darker on veins; discal dot absent; median shade line very weakly indicated, situated nearer t. p. than t. a. line, and with veins between median and t. p. lines brownish black in center and lower portions of wing; t. p. line arising on costa four-fifths of distance from base, subparalleling outer margin but with basal bows

opposite cell and above anal vein, appearing as blackish brown, elongate spots on veins, these being connected by concave brownish black line; terminal line slender, and with small blackish brown intravenular dots; fringe pale gray basally, with outer portion concolorous with wing. Hind wings white, with pale brown and brownish gray scaling in outer portion of wing; discal spot grayish black, prominent; extradiscal line complete, more heavily represented and outwardly dentate on veins; terminal line similar to that of forewings; fringe concolorous with wing.

**UNDER SURFACE OF WINGS:** Forewings pale grayish white, hind wings white, both with scattered brown scales; all wings with discal dots and outer cross line, with latter represented by venular dots, maculation on hind wings heavier than that of forewings; terminal line obsolescent; fringes concolorous with wing.

**LENGTH OF FOREWING:** 16 mm.

**FEMALE:** Unknown.

**MALE GENITALIA:** Uncus broad basally, tapering apically, 1.2 mm. in length; socius small; gnathos slender, tapering to median point, valves with costa concave and swollen in apical region, asymmetrical, apex pointed, right costa terminally rounded and with small median protuberance, left valve with digitate process, then concave to apex; each valve with small, longitudinal, sclerotized ridge, and with band of prominent setae anteriorly; anellus small, anterior margins longer than posterior ones, and with median sclerotized ridge extending length of anellus but more prominent anteriorly; pointed processes of anellus 1.2 mm. in length, arising from broad basal section, with posterior S-shaped section heavily sclerotized and tapering to apex, and with posterior margin finely setose; cristae very long; aedeagus 3.1 mm. in length, straight, with bluntly rounded posterior end; vesica, when exerted, extending at about 90-degree angle to aedeagus, with two groups of four spines on each side near apex of aedeagus, terminally with three elongate, thick spines and with large group of very slender spines on oneside.

**FEMALE GENITALIA:** Unknown.

**TYPE:** The holotype, male, is in the collection of the British Museum (Natural History).

**TYPE LOCALITY:** Puente del Inca, elevation 2720 meters, Mendoza Province, Argentina.

**DISTRIBUTION:** Argentina (Mendoza Province).

**TIME OF FLIGHT:** The holotype and paratype

emerged from pupae in November and December; their cocoons were found attached to the undersides of stones.

**REMARKS:** One specimen (the single paratype of this species) and one genitalic dissection have been studied.

Prout, in his discussion following the original description, gave some descriptive notes on a female that is larger and darker than the male. This moth has been examined, and it is *tumida*.

The specific name is spelled two ways at the beginning of the original description. The spelling "*eudora*" is repeated in the text and for the caption of the plate, as well as being so written by Prout on the paratype label. Accordingly, this is the spelling that is being used, as it seems highly probable that the variant orthography was a printer's error.

### ***Salpis felderi* (Butler)**

Figures 25, 32

*Colotois ? chilendaria* ? C. FELDER, R. FELDER, AND ROGENHOFER, 1874 (1864-1875), pl. 124, fig. 7 (female).

*Azelina felderi* Butler, 1882, p. 355, pl. 16, fig. 5 (male).

*Salpis (Microdontopera) felderi*: Prout, 1910, p. 320.

**DIAGNOSIS:** This moth has the upper surface of the forewings brownish gray, with more or less distinct cross lines, and with the outer margin of the forewings crenulate. The genitalia are similar to those of *eudora*; they are differentiated in the key.

**MALE:** Head with vertex pale grayish brown; front dark brown dorsally, becoming pale grayish brown ventrally; palpi rising to middle of eye, third segment very long, all segments grayish brown, with dark brown scaling; antennae with longest pectinations 0.4 mm. in length. Thorax pale grayish brown above, paler below; legs grayish brown, with brown scaling, tarsi concolorous with other segments.

**WINGS:** Forewings broad, with apex produced and with weak concavity below apex; outer margins of all wings weakly scalloped.

**UPPER SURFACE OF WINGS:** Forewings unicolorous pale brownish gray, with scattered gray and dark brown scales; cross lines weakly or moderately indicated; t. a. line obsolescent, sinuous in course; discal dot absent; median shade line nebulous, broad, situated nearer t. p. than t. a. line; t. p. line arising on costa four-fifths of distance from base, extending more or



less straight across wing, slightly more heavily represented on veins by brown dots, these followed by faint grayish white scaling; terminal area with small nebulous brownish gray spot on vein  $M_2$ ; terminal line represented by small blackish brown intravenular dots; fringe concolorous with wing, slightly darkened at vein endings. Hind wings whitish gray, with numerous pale brownish gray scales, especially in outer portion of wing; discal dot minute; extradiscal line obsolescent, appearing as faint whitish gray band; terminal line and fringe similar to those of forewings.

**UNDER SURFACE OF WINGS:** Forewings very pale brownish gray, hind wings whitish gray, both with grayish brown and brown scaling; all wings with minute discal dots and faint traces of outer cross line appearing as small dots on veins; terminal intravenular dots very weakly represented; fringe tending to be brown on forewing, at least in anterior portion of wing, and concolorous with hind wing.

**LENGTH OF FOREWING:** 17 mm.

**FEMALE:** Similar to male; antennae serrate; forewings with outer margin more strongly scalloped; maculation heavier.

**LENGTH OF FOREWING:** 19 mm.

**MALE GENITALIA:** Uncus broad basally, tapering apically, 1.1 mm. in length; socius small; gnathos slender, tapering to median point, posterior surface of gnathos dentate; valves with outer portion of costa swollen and with irregular margin, weakly asymmetrical, then concave to sclerotized apical point of valve; each valve with small, longitudinal, sclerotized ridge bearing very slender setae, and with band of thicker setae anteriorly; anellus with anterior margins longer than posterior ones, and with median sclerotized ridge on anterior three-fourths of anellus; pointed processes of anellus 1.1 mm. in length, arising from broad, curved basal section, with posterior section more heavily sclerotized, curved, and tapering to apex; cristae very long; aedeagus 2.7 mm. in length, weakly curved, with bluntly pointed, sclerotized, posterior end; vesica, when exerted, extending at about 45-degree angle to aedeagus, with group of four spines on one side and three spines on other side near apex of aedeagus, terminally with two very long and slender spines, approximately 10 shorter, thicker spines, and circular area of spicules.

**FEMALE GENITALIA:** Unknown (the single

specimen examined had a male abdomen glued to the thorax).

**TYPES:** Butler did not specify the number of specimens of either sex he had before him when he described *felderi*. The lectotype is hereby designated as the male with its genitalia mounted by me on Geometridae slide No. 7501. This specimen is in the collection of the British Museum (Natural History).

**TYPE LOCALITY:** Las Zorras, a small suburb of Valparaíso, Valparaíso Province, Chile.

**DISTRIBUTION:** This species is known only from the type series from Valparaíso, Chile.

**TIME OF FLIGHT:** The types were collected at flowers in February, March, and April.

**REMARKS:** Two specimens (one male and one female) and one genitalic dissection (male) have been examined.

The figure given by C. Felder, R. Felder, and Rogenhofer is much bluer in color than the specimens before me. The color of the upper surface of the forewings of *felderi* is a rather even pale brownish gray with a faint hint of bluish gray; in this respect it is unique in the genus.

The male genitalia are similar to those of *eudora* but are smaller, and there are differences in the configuration of the costal area of the valves.

## GROUP II

The male moths of this group have genitalia in which the exerted vesica (insofar as they are known) extends at almost a right angle to the aedeagus. The processes of the anellus are small and weakly sclerotized. The valves are large, elongate, simple, and each has a straight costa and narrow base. The anellus is large, broad, and without a central ridge.

The female genitalia are quite elongate. They have the lamella antevaginalis reduced to a slender strip. The distinct ductus bursae is small, and it is longer than wide. The ductus seminalis may arise either ventrally or dorsally. The corpus bursae is very long, narrowed posteriorly, and has a well-developed ventral signum.

The moths are usually larger than those of group I, with the length of the forewings of the males ranging from 16 to 21 mm., and of the females from 16 to 22 mm. The wings are either broad or elongate, and the apex of the forewings is produced. The upper surface of the fore and hind wings is a concolorous brown or grayish brown in color. The antennae of both sexes are

simple. The males have both the tibial hair pencil and the row of setae on the ventral surface of the third abdominal segment.

The following three species are included: *infelix*, *unda*, and *falcata*.

***Salpis infelix* (Butler)**

Figures 43, 46, 49

*Sabulodes infelix* BUTLER, 1882, p. 350.

*Salpis (Salpis) infelix*: PROUT, 1910, pp. 320, 321.

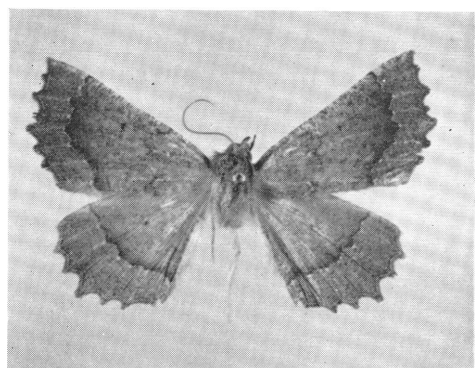
**DIAGNOSIS:** This is the smallest species of the group. The moths have the upper surface of the wings brown, the outer margins of all wings deeply scalloped.

**MALE:** Head with vertex, front, and palpi grayish brown; palpi rising to above middle of eye. Thorax grayish brown above, grayer below; legs pale gray or grayish white, with dark brown scaling, and with tarsi tending to be pale brownish gray, with ends of segments narrowly paler. Abdomen grayish brown above, grayer below, with scattered dark brown scales.

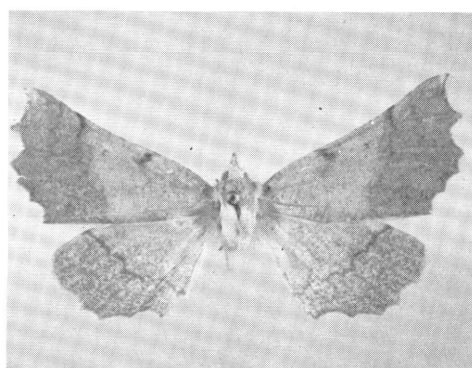
**WINGS:** Forewings broad, with pointed apex; all wings with outer margin deeply scalloped.

**UPPER SURFACE OF WINGS:** Forewings unicolorous brownish gray or brown, with scattered dark brown scales; t. a. line obsolescent, arising about one-fourth of distance from base, apparently crossing wing with outward curves in cells; discal dot small; median line absent; t. p. line complete, narrow, blackish brown, outwardly pointed on veins, bordered distally by slender white row of scales, arising on costa about four-fifths of distance from base, subparalleling outer margin but with basal swing above outer angle; terminal line brownish black, very slender, interrupted by veins; fringe concolorous with wing, becoming narrowly whitish on outer part opposite cells. Hind wings concolorous with forewings; discal dot very small; extradiscal line, terminal line, and fringe similar to those of forewings.

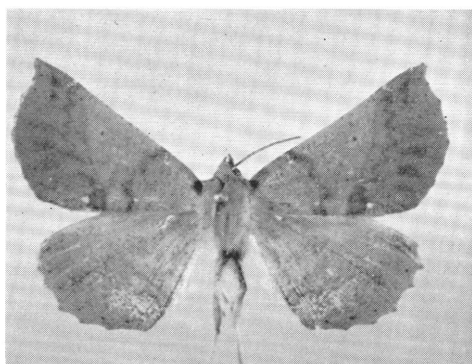
**UNDER SURFACE OF WINGS:** All wings grayish brown, with brownish gray and dark brown



43



44



45

FIGS. 43–45. Adults. 43. *Salpis infelix* (Butler), male, Piscicultura, Aconcagua Province, Chile, November 17–30, 1968 (L. E. Peña; A.M.N.H.). 44. *Salpis unda*, new species, holotype male, Piscicultura, Aconcagua Province, Chile, November 17–30, 1958 (L. E. Peña; A.M.N.H.). 45. *Salpis falcata*, new species, holotype male, Fundo Malcho, Linares Province, Chile, December, 1957 (L. E. Peña; A.M.N.H.). All  $\times 1.5$ .

scaling; forewings gray along inner margin; all wings with black discal spots and outer cross lines; terminal line and fringe similar to those of upper surface.

LENGTH OF FOREWING: 16 to 19 mm.

FEMALE: Similar to male, but with smaller eyes.

LENGTH OF FOREWING: 16 to 20 mm.

MALE GENITALIA: Uncus slender, elongate, 1.3 mm. in length; socius elongate; gnathos slender, with small, curved median area; valve with narrow base, slender, with costa straight, and having median area of valve with elongate setae extending from apex to beyond middle of valve; anellus with broad anterior incision, posterior margins concave and elongate; paired structures of anellus small, 0.5 mm. in length, becoming more heavily sclerotized and pointed posteriorly; cristae very long; aedeagus 3.6 mm. in length, with elongate, pointed posterior end; vesica, when exerted, extending at right angle to aedeagus, and with slightly oblique row of approximately 20 spines, becoming double distally and having about 10 longer spines, and with small group of additional spines posteriorly on anterior surface.

FEMALE GENITALIA: Sterigma membranous except for narrow U-shaped rod extending dorsally to apophyses anteriores; ductus bursae short, with anterior one-half narrowed and laterally sclerotized; ductus seminalis arising ventrally from posterior end of corpus bursae; latter very long, with posterior portion angled, weakly sclerotized, and having longitudinal striations, with anterior portion gently swollen and having truncate apex; signum large, 0.7 mm. in length, situated ventrally, with area surrounding signum weakly sclerotized and finely reticulate, signum purselike, with posterior opening, and with numerous short spinose projections dorsally and around margins; apophyses posteriores 2.4 to 2.5 mm. in length.

TYPE: Butler gave no indication of either the number of specimens or their sex in the original description. The type in the collection of the British Museum (Natural History) is a male, and its genitalia have been mounted by me on Geometridae genitalia slide No. 7503.

TYPE LOCALITY: Las Zorras, a small suburb of Valparaíso, Valparaíso Province, Chile.

DISTRIBUTION: Central Chile. The localities range from the coastal region (the provinces of Valparaíso and Maule) and the central valley

(Santiago Province), to the Andes (the provinces of Coquimbo, Aconcagua, Santiago, Curicó, and Ñuble). Those few specimens with elevation data indicate that the Andean moths have been captured from 900 to 2800 meters.

TIME OF FLIGHT: November, December, January, and February.

REMARKS: Sixty-three specimens (39 males and 24 females) and eight genitalic dissections (five males, including that of the type, and three females) have been studied.

This species is quite consistent in its color and maculation, not only within but between the sexes.

**Salpis unda**, new species

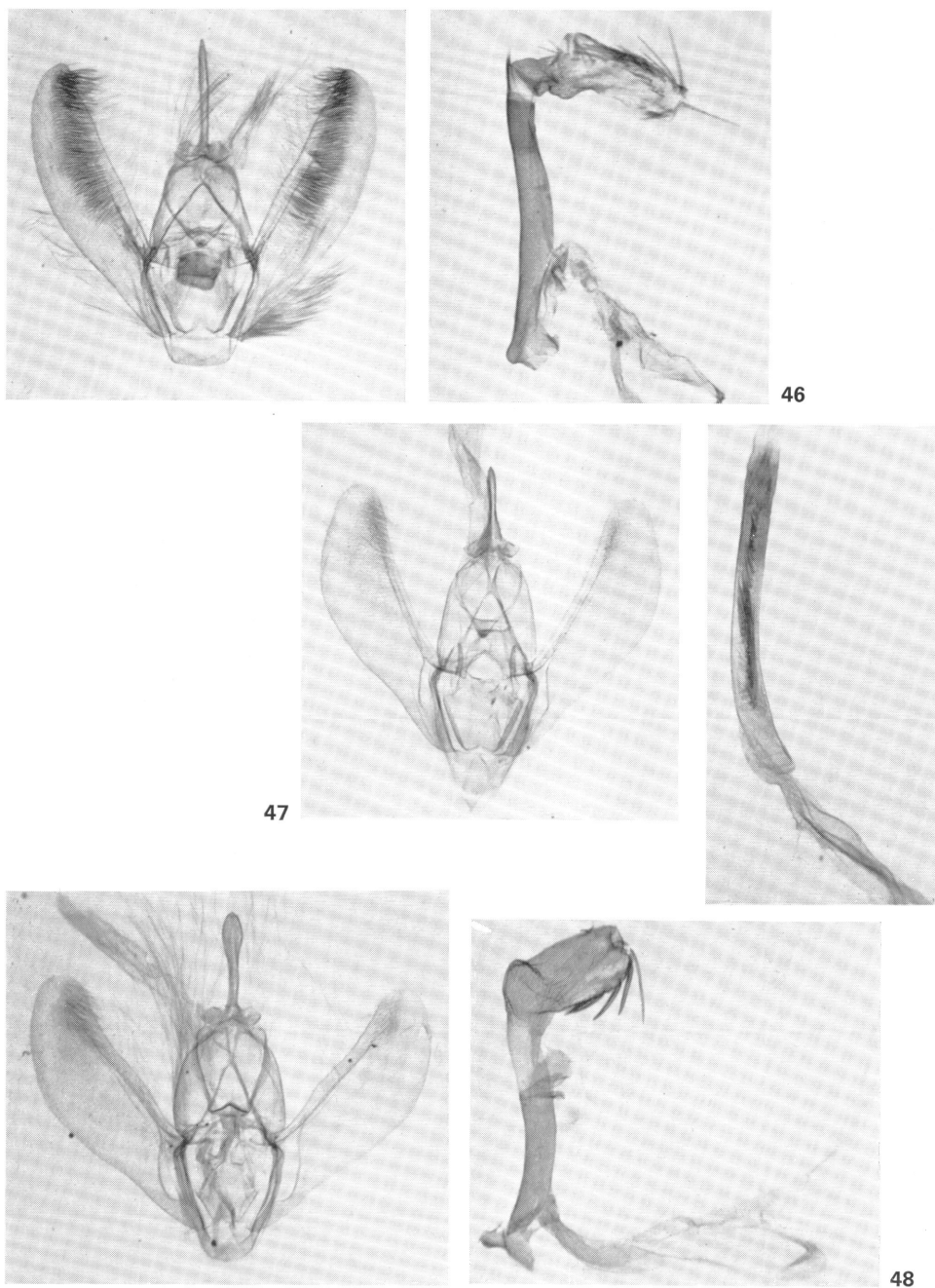
Figures 44, 47, 50

DIAGNOSIS: This moth is larger than *infelix*, and has the upper surface of the forewings darker beyond the t. p. line than basally, and a strongly scalloped outer margin on all the wings.

MALE: Head with vertex white or with grayish brown scaling dorsally; front grayish brown; palpi very long, rising to about middle of eye, brownish gray. Thorax grayish white above, with some grayish brown scaling; white below; legs grayish white, with brownish gray scaling, especially on tarsi. Abdomen grayish white above, paler below, with scattered grayish brown and dark brown scales.

WINGS: Forewings with sharply attenuate apex, and with deeply scalloped outer margin; hind wings with less strongly scalloped outer margin.

UPPER SURFACE OF WINGS: Forewings pale gray, with area distad of t. p. line darker gray or brownish gray; t. a. line arising on costa about one-third of distance from base, as broad, outwardly angled dark gray mark crossing into cell, then angled posteriorly and becoming obsolescent or very weak, having blunt, inward angles on veins; discal dot small; median line absent; t. p. line arising on costa about three-fourths of distance from base, with either or both of two lines, basal one extending across wing as almost straight or very weakly curved line to meet inner margin just distad of middle, and with second, dentate, more curved line just distad of first line; s. t. line represented in anterior part of wing as narrow, dark, dentate line; terminal line absent; fringe concolorous with, or slightly darker than, wing. Hind wings concolorous with forewings, darker beyond dual extradiscal line than basally;



FIGS. 46-48. Male Genitalia. 46. *Salpis infelix* (Butler), El Coigual, Curicó Province, Chile, January 21-29, 1964 (L. E. Peña; A.M.N.H.). 47. *Salpis unda*, new species, paratype, Fundo El Roble, Ñuble Province, Chile, January 14, 1968 (L. E. Peña; A.M.N.H.). 48. *Salpis falcata*, new species, holotype, Fundo Malcho, Linares Province, Chile, December, 1957 (L. E. Peña; A.M.N.H.).

discal dot and terminal line absent; fringe similar to that of forewing.

**UNDER SURFACE OF WINGS:** All wings gray or brownish gray, with variable amount of grayish brown scaling; forewings pale gray along inner margin; discal dots usually absent from all wings, weakly represented on hind wings in some specimens; all wings with faint traces of t. p., extradiscal, and s. t. lines; terminal line represented by a few, small intravenular dots on anterior portion of hind wing; fringe brown on forewings, concolorous with hind wing.

**LENGTH OF FOREWING:** 18 to 20 mm.; holotype, 20 mm.

**FEMALE:** Similar to male; eyes same size as in males; both upper and under surfaces of wings with faint, pale brown tint to outer portions of wings.

**LENGTH OF FOREWING:** 20 mm. (allotype).

**MALE GENITALIA:** Uncus weakly swollen posteriorly, 0.8 to 1.0 mm. in length; socius small; gnathos slender, with small, curved median area; valve with narrow base, costa straight, and with inner face of valve covered with slender setae; anellus with shallow anterior incision, posterior margins weakly concave; paired structures of anellus 0.5 to 0.6 mm. in length, slender, gently curved and becoming pointed posteriorly; cristae absent or represented by four to six setae on each side; aedeagus 3.3 to 3.7 mm. in length, with elongate, weakly capitate posterior end; vesica with approximately 15 shorter spines in slightly oblique row, and with approximately 15 much longer spines distally.

**FEMALE GENITALIA:** Sterigma membranous except for sclerotized band extending dorsally to apophyses anteriores; ductus bursae 0.85 mm. in length, slightly more than twice as long as wide, rectangular, evenly sclerotized; ductus seminalis arising ventrally from posterior end of corpus bursae; latter very long, with elongate, slender, longitudinally striate posterior portion, and with shorter, globular anterior part; signum large, 0.6 mm. in length, situated ventrally, purselike, with posterior opening, and with numerous short spinose projections dorsally and around margins; apophyses posteriores 1.5 mm. in length.

**TYPES:** Holotype, male and allotype, female, Piscicultura, Río Blanco, Andes Mountains, Aconcagua Province, Chile, November 17–30, 1958 (L. E. Peña). The genitalia of the holotype are mounted on slide F.H.R. No. 13128, and of

the allotype on No. 13127. Paratypes, all from Chile: Fundo El Roble, Coihueco, east of Chillan, Ñuble Province, January 17, 1968 (L. E. Peña), three males; Los Cipreces, high mountains in Talca Province, January 14, 1968 (L. E. Peña), one male.

All the type material is in the collection of the American Museum of Natural History.

**DISTRIBUTION:** Andes Mountains of central Chile (provinces of Aconcagua, Talca, and Ñuble).

**TIME OF FLIGHT:** November and January.

**REMARKS:** Six specimens (five males and one female) and four genitalic dissections (three males and one female) have been studied.

There is some variability in the color and maculation of the specimens. The freshest specimens, caught in November, are a clear gray in color; the older (January) moths tend to be browner. There is considerable variation in the strength and nature of the t. p. line on the upper surface of the forewings. The line varies from being double and weakly represented (holotype), to having a broad, almost straight, basal line only, to having only the outer, thin, dentate line.

***Salpis falcata*, new species**

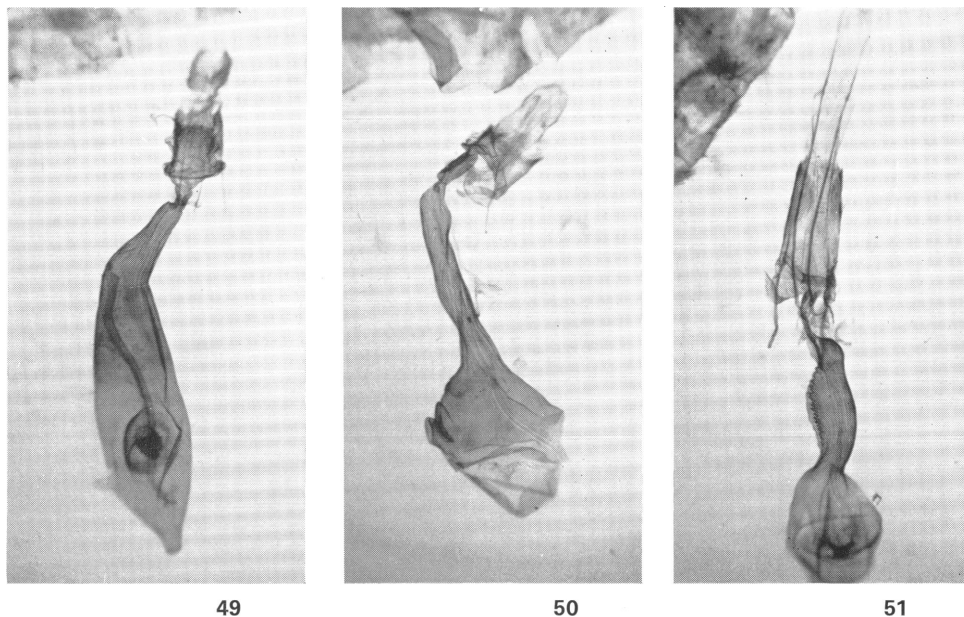
Figures 45, 48, 51

**DIAGNOSIS:** This species can be recognized by its large size, the brown or grayish brown forewings with strongly falcate apices, and the small white spot just beyond the double t. p. line above the inner margin.

**MALE:** Head with vertex, front, and palpi brownish gray; palpi rising to about middle of eye; antennae with pedicel and scape white. Thorax grayish brown or pale brown above, with some grayish white scaling; paler below; legs grayish white, with some brownish gray and blackish brown scaling, with grayish black scales on spurs. Abdomen pale brown or grayish brown above, paler below.

**WINGS:** Forewings strongly falcate, with broadly and smoothly rounded outer margin; hind wings with outer margin scarcely scalloped.

**UPPER SURFACE OF WINGS:** Forewings brown or grayish brown, with area distad of t. p. line darker brown in most specimens; t. a. line rather broad, diffuse, grayish black, arising on costa one-fourth of distance from base, curving outward across wing with basal bends on veins, incompletely margined basally by a few white



FIGS. 49–51. Female Genitalia. 49. *Salpis infelix* (Butler), Río Hurtado, Coquimbo Province, Chile, November 4, 1951 (L. E. Peña; A.M.N.H.). 50. *Salpis unda*, new species, allotype, Piscicultura, Aconcagua Province, Chile, November 17–30, 1958 (L. E. Peña; A.M.N.H.). 51. *Salpis falcata*, new species, allotype, Río Blanco, Malleco Province, Chile, February, 1964 (L. E. Peña; A.M.N.H.).

scales, especially on veins; discal dot small, black; median line absent; t. p. line arising about four-fifths of distance from base, double, inner part extending almost straight across wing, outer part outwardly dentate, having some white scaling on veins, latter most prominent on anal vein; terminal line absent; fringe either concolorous with wing or whitish, brown at ends of veins. Hind wings concolorous with forewings, most specimens with outer portion not noticeably darker than basal area; discal dot absent; extradiscal line weakly represented or obsolescent, geminate; scattered white scaling present above anal angle; terminal line absent; fringe like that of forewings.

**UNDER SURFACE OF WINGS:** All wings dull brown or grayish brown, with broad, straight, brown t. p. band on forewings and with broader extradiscal band on hind wings; discal dot absent on forewings, very large and brownish black on hind wings; terminal line weakly represented on hind wings; fringes concolorous with wings but dark brown opposite vein endings.

**LENGTH OF FOREWING:** 18 to 21 mm.; holotype, 20 mm.

**FEMALE:** Similar to male but tending to be slightly grayer; eyes same size as in males.

**LENGTH OF FOREWING:** 20 to 22 mm.; allotype, 21 mm.

**MALE GENITALIA:** Uncus with posterior portion at least twice as wide as median section, terminating in small, ventrally pointed spine, with length of uncus 1.1 to 1.2 mm.; socius small; gnathos with relatively wide sides and with broad, V-tipped median enlargement; valve with narrow base, with costa straight, with narrow membranous area at base of valve on inner surface, and with group of elongate setae terminally on valve; anellus with median anterior incision, posterior margins weakly S-shaped and with small median protuberance; paired structures of anellus 0.8 to 0.9 mm. in length, slender, either straight with slightly bent apex or weakly S-shaped, bluntly pointed posteriorly; cristae sparse; aedeagus 3.0 to 3.1 mm. in length, with bluntly pointed posterior end; vesica, when exerted, extending at acute angle to aedeagus, and having about nine setae in single row, becoming shorter anteriorly.

**FEMALE GENITALIA:** Sterigma membranous



except for sclerotized band extending dorsally to apophyses anteriores; ductus bursae short, about 0.4 mm. in length, sclerotized laterally, slightly tapered anteriorly; ductus seminalis arising dorsally from slender posterior extension of corpus bursae; latter very large, median portion weakly sclerotized, swollen ventrally and on right side, longitudinally striate, tapering dorsally and to left side, having very irregular margin to sclerotized area, and with anterior portion globose; signum large, 0.5 to 0.7 mm. in length, situated ventrally, with area laterad and posteriad of signum weakly sclerotized and reticulate, signum purselike, with posterior opening, and with numerous short spinose projections dorsally and around margins; apophyses posteriores very long, 5.1 to 5.6 mm.

**TYPES:** Holotype, male, Fundo Malcho, Cordillera Parral, Andes Mountains, Linares Province, Chile, December, 1957 (L. E. Peña); allotype, female, Río Blanco, near Curacautin, Andes Mountains, Malleco Province, Chile, February, 1964 (L. E. Peña). The genitalia of the holotype are mounted on slide F.H.R. No. 15678, and of the allotype on No. 13125. **Paratypes:** *Chile:* Same data as holotype, January, 1958 (L. E. Peña), one male; same data as allotype, one female; Piscicultura, Río Blanco, Andes Mountains, Aconcagua Province, November 17–20, 1958 (L. E. Peña), one male; Río Teno, mountains of northeastern Curicó Province, January 24–26, 1968 (L. E. Peña), three males and three females. *Argentina:* El Bolson, Río Negro Province, December 14, 1961, March 14, 1961 (A. Kovacs), one male and one female; El Manso, Río Negro Province, January 4, 1960 (A. Kovacs), one female.

All the type material is in the collection of the American Museum of Natural History.

**DISTRIBUTION:** Andes Mountains in both central Chile (the provinces of Aconcagua,

Curicó, Linares, and Malleco) and Argentina (Río Negro Province). The allotype was collected in a *Nothofagus* forest.

**TIME OF FLIGHT:** From mid-November through mid-March.

**REMARKS:** Fourteen specimens (seven males and seven females) and six genitalic dissections (four males and two females) have been studied.

The three specimens from Argentina tend to be slightly smaller, slightly grayer, and to have less prominent maculation than do the Chilean examples.

### GROUP III

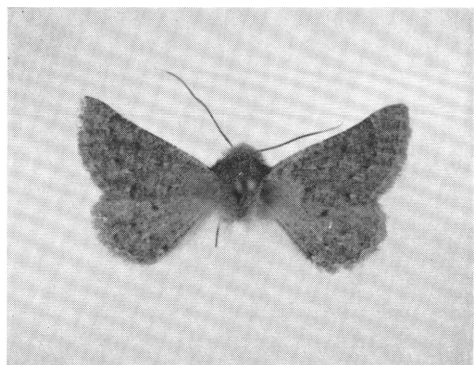
The male moths of this group have genitalia in which the exerted vesica (insofar as they are known) extends at between a 45- and 90-degree angle to the aedeagus. All species have a finger-like process arising from the outer portion of each valve. The processes of the anellus have tips that either taper to a point or have some small dentitions along the posterodorsal margin. The anellus is relatively long and narrow, with an anterior central ridge, and with a prominent, sclerotized, posteromedian extension.

The female genitalia have a lamella antevaginalis that is large and heavily sclerotized, the ductus bursae is short, the ductus seminalis arises ventrally or on the right side, the corpus bursae is very long and either has or has not a well-developed signum.

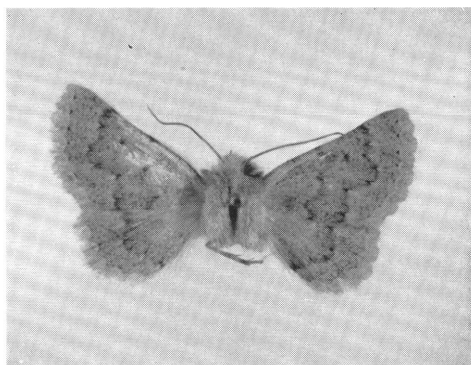
The moths are small to medium in size, with the length of the forewings varying from 14 to 20 mm. in the males, and from 16 to 18 mm. in the females. The wings are broad, and the apices of the forewings are pointed; the upper surface of both wings is a concolorous brown. The antennae of the males are pectinate, fasciculate, or simple, and those of the female are simple. The males may or may not have the tibial hair pencil

---

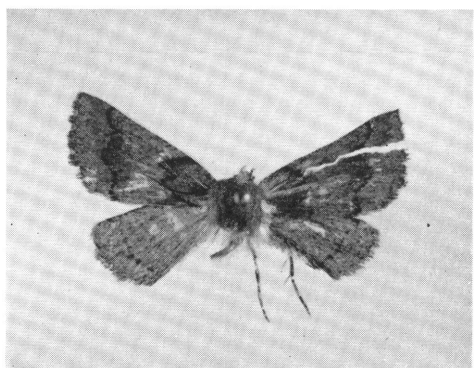
**FIGS. 52–59. Adults.** 52. *Salpis albipunctaria* Mabilie, male, Confluencia, Neuquén Province, Argentina, February 12, 1956 (Schajovskoy; B.M.). 53. *Salpis lancea*, new species, holotype male, Q[uebrada] Chaquina, Tarapacá Province, Chile, September 23, 1951 (L. E. Peña; C.U.). 54. *Salpis unica*, new species, holotype female, Icalma, Malleco Province, Chile, January 2, 1968 (L. E. Peña; A.M.N.H.). 55. *Salpis rubens* Prout, paratype male, Zanjón Amarilla, Mendoza Province, Argentina, November 16, 1905 (W. M. Bayne; B.M.). 56. *Salpis carneitincta* Prout, paratype female, Puente del Inca, Mendoza Province, Argentina, March 16, 1905 (W. M. Bayne; B.M.). 57. *Salpis puechi* (Dognin), male, Achacachi, La Paz [Department], Bolivia, September 18, 1899 (Garlepp; B.M.). 58. *Salpis brevis*, new species, holotype male, La Vinilla, Curicó Province, Chile, February 14–18, 1961 (L. E. Peña; A.M.N.H.). 59. *Salpis orbifera* Prout, holotype, Cacheuta, Mendoza Province, Argentina, January (W. M. Bayne; B.M.; B.M. photo, with millimeter scale across bottom of picture). All  $\times 1.5$ , except 59.



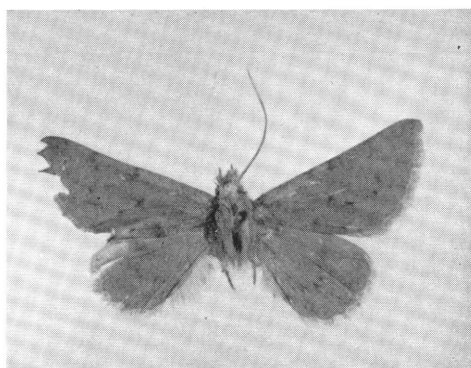
52



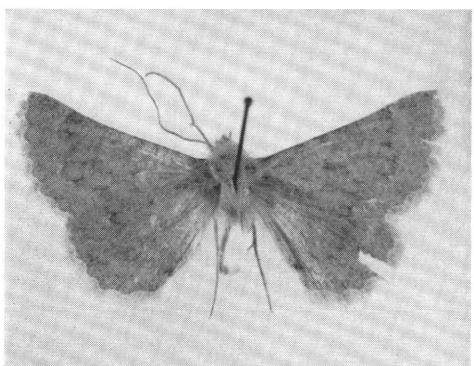
53



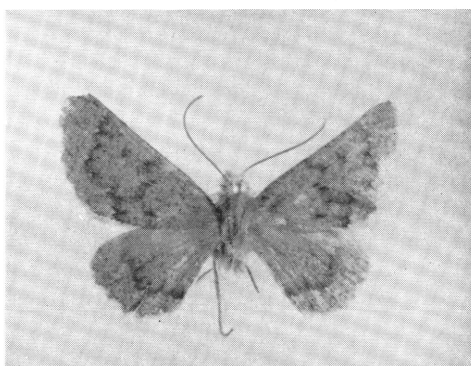
54



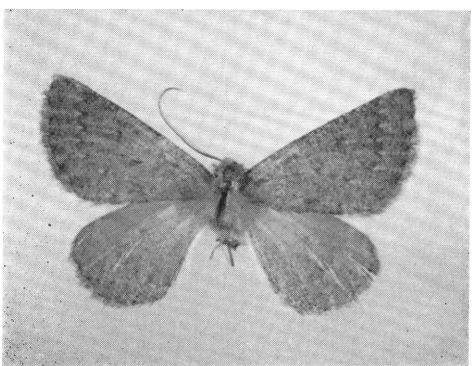
55



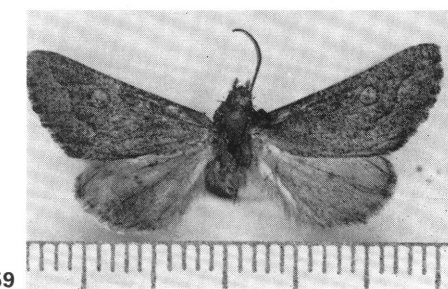
56



57



58



59

and the row of setae on the ventral surface of the third abdominal segment.

The following nine species are included: *scodionata*, *albipunctaria*, *lancea*, *unica*, *rubens*, *carneitincta*, *puechi*, *brevis*, and *orbifera*.

#### ***Salpis scodionata* Mabille**

Figure 60

*Salpis scodionata* MABILLE, 1885, p. 66; 1889, p. 160, pl. 11, fig. 5 (male).

*Salpis scodionoeta* (sic!): MABILLE, 1889, p. 156.

*Pseudosalpis scodionoeta* (sic!): STAUDINGER, "1898" (1899), p. 83. PROUT, 1910, p. 320.

No specimens of this species have been examined. Based on Mabille's colored figure (1889, pl. 11, fig. 5) and description, this is a small moth (length of forewing 15 mm.) with elongate forewings. The concolorous and unicolorous yellowish white wings are more or less densely irrorate with fine black scales. There is an incomplete t. a. line, and the complete t. p. line is represented primarily by small dark venular spots. The discal dot is absent from the forewings, but an elongate dash is present on the hind wings. The latter also have a weakly defined extradiscal line. The antennae are simple.

Mr. D. S. Fletcher, of the British Museum (Natural History), has kindly furnished me with a photograph of the genitalia of the type. The uncus is elongate and appears weakly swollen apically. The valves are long, slender, and curving apically, with a single or double armlike process. The anellus is small, possesses a median ridge and a small, pointed posterior protuberance. The processes of the anellus are very large and characteristic for this species; they are enlarged apically, have an irregular outer margin, and terminate in a curving point. The elongate aedeagus has a median group of slender spines, and a terminal group that apparently includes at least one thick spine.

*Salpis scodionata* was apparently described from a single male specimen, which is in the collection of the Muséum National d'Histoire Naturelle, Paris.

In 1885, Mabille gave the type locality as Patagonia; in 1889, as Punta-Arenas. I assume that this means Punta Arenas, Magallanes Province, Chile.

#### ***Salpis albipunctaria* Mabille**

Figures 52, 161

*Salpis albipunctaria* MABILLE, 1885, p. 66; 1889, p. 155, pl. 11, fig. 6 (male). PROUT, 1910, p. 320.

*Pseudosalpis albipunctaria*: STAUDINGER, "1898" (1899), p. 82.

DIAGNOSIS: This small species has the upper surface of the wings darker in color than does *scodionata*. The male genitalia of these two species are quite distinct from each other; see the key for details.

MALE: Head, vertex and front brownish gray; palpi rising to middle of eye, covered with mixed pale gray, dark gray, and brownish black scales; antennae simple, with pedicel and scape grayish white. Thorax brownish gray above, pale gray below; legs whitish gray, with dark brown scales.

WINGS: Forewings broad, pointed; outer margins of all wings weakly scalloped.

UPPER SURFACE OF WINGS: Forewings unicolorous brownish gray, with evenly scattered black scales; t. a. line obsolescent, faintly indicated on costa and on veins; discal dot present; median line absent; t. p. line weakly represented, arising on costa five-sevenths of distance from base, subparalleling outer margin in upper portion of wing, with poorly defined basal loop above inner margin, and represented mainly as venular spots with distal white scaling; terminal line absent; fringe concolorous with wing, quite long. Hind wings concolorous with forewings but with fewer dark scales; discal spot present; extradiscal line present, more or less obsolete anteriorly, represented mainly as dark venular dots with white distal shading; terminal line weakly represented; fringe similar to that of forewing.

UNDER SURFACE OF WINGS: All wings brownish gray, slightly paler than upper surface, with more widely scattered brownish black scales; discal dots and outer cross lines present on all wings, those on hind wings more clearly defined than those of forewings; terminal line and fringe similar to those of upper surface.

LENGTH OF FOREWING: 14 mm.

FEMALE: Unknown.

MALE GENITALIA: Uncus elongate, 1.25 mm. in length, very slightly swollen beyond middle, apex weakly hooked; socius small; gnathos with elongate, slender, curved median area; valve with weakly S-shaped costa, with one thick and one thin sclerotized, tapering spines arising from sclerotized base on right valve, with two thick and one thin sclerotized, tapering spines arising from sclerotized base on left valve, and with both valves having area of elongate setae near end of valve and from along sclerotized bases of spines;

anellus with broad anterior incision, with small median ridge, and with broad posterior protuberance, in length two-thirds that of anellus; paired structures of anellus 0.65 mm. in length, basal portion rounded, and with posterior end curved, inner surface variably dentate; cristae present; aedeagus 2.8 mm. in length, with sclerotized, faintly scoop-shaped posterior end; vesica with median area of fine spines and with two elongate spines. Abdomen with ventral row of setae on third segment.

FEMALE GENITALIA: Unknown.

TYPE: Mabilie apparently described *albipunctaria* from a single male specimen, which is in the collection of the Muséum National d'Histoire Naturelle, Paris.

TYPE LOCALITY: In 1885, Mabilie gave the type locality as Patagonia; in 1889, as Punta Arenas. I assume that this means Punta Arenas, Magallanes Province, Chile.

DISTRIBUTION: Southern Chile (Magallanes Province) and Argentina (Neuquén Province).

TIME OF FLIGHT: February.

REMARKS: One specimen and one genitalic dissection, plus a photograph of the genitalia of the type furnished me by Fletcher, have been studied.

The moth from Argentina, as compared with Mabilie's colored figure of the type (1889, pl. 11, fig. 6), is a darker brown with more black scaling, the cross lines are less conspicuous, and it lacks the relatively broad, pale band just distad of the outer cross lines.

**Salpis lancea**, new species

Figures 53, 62, 68

DIAGNOSIS: This species is larger than *albipunctaria*, and the upper surface of the wings are more reddish brown in color, with more distinct cross lines. The male antennae are bifasciculate, whereas in *albipunctaria* they are simple.

MALE: Head with vertex covered by very long, faintly pinkish brown hairlike scales; front grayish white; palpi very long, rising to about middle of eye, grayish brown or dark brown on outer surface, white on inner surface; antennae bifasciculate, with median and (apparently) terminal fascicles. Thorax grayish brown above, slightly paler below; legs grayish brown; hind legs without hair pencil, slightly paler than other legs. Abdomen gray above, with numerous brown scales; paler below.

WINGS: Forewings broad, pointed; outer margins of all wings scalloped.

UPPER SURFACE OF WINGS: Forewings unicolorous brown with faint pinkish cast and with scattered brownish black scales, the latter sometimes somewhat concentrated in median area; cross lines present, grayish black; t. a. line arising on costa about two-fifths of distance from base, outwardly curved in cells, angled basally on veins; discal dot present; median line absent; t. p. line arising on costa about seven-tenths of distance from base, more strongly represented on veins, these spots often followed by small, elongate, whitish venular dots with strong outward bow from veins  $M_1$  to  $Cu_2$ , thence running perpendicularly to inner margin; terminal line incomplete, with intravenular dots in anterior portion of wing; fringe long, concolorous with wing. Hind wings concolorous with forewings except for grayer basal portion; discal dot absent; extradiscal line complete, with large outward bow from cell  $M_1$  to vein  $Cu_2$ ; terminal line weakly represented; fringe similar to that of forewing.

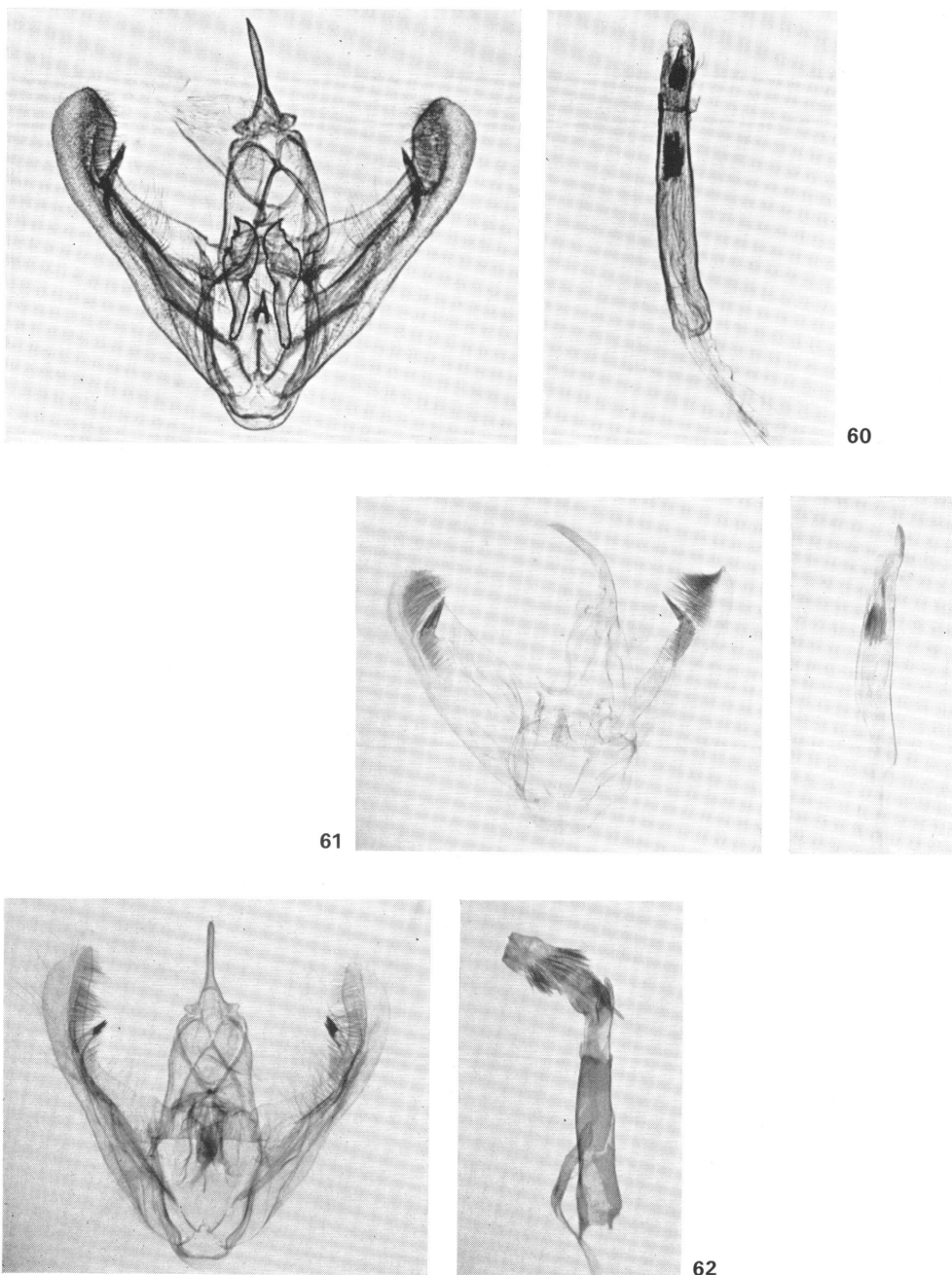
UNDER SURFACE OF WINGS: All wings pale brownish gray, with scattered dark grayish brown scales; discal dots absent or obsolescent; outer cross lines broad, inwardly dentate on veins; terminal lines absent; fringes concolorous with wings.

LENGTH OF FOREWING: 14 to 16 mm.; holotype, 16 mm.

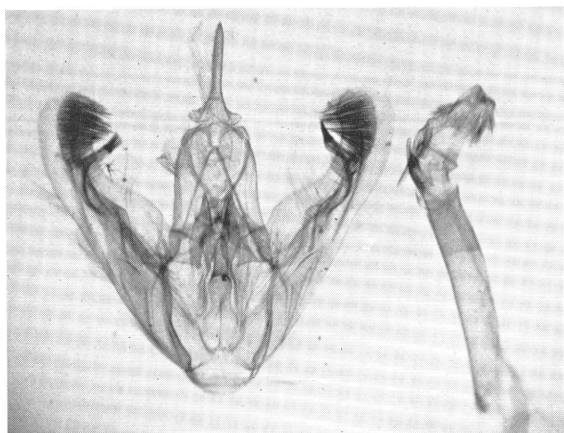
FEMALE: Similar to male; antennae simple; upper surface of wings slightly darker than that of male.

LENGTH OF FOREWING: 16 mm. (allotype).

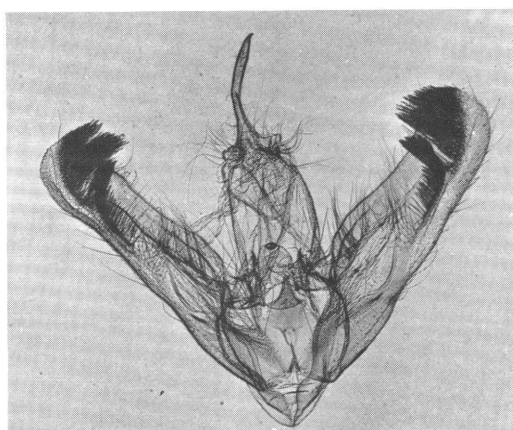
MALE GENITALIA: Uncus elongate, 1.0 mm. in length, dorsal surface with very slender setae; socius small; gnathos with slender, curved median area; each valve with concave costa and bluntly pointed apex, with single, slender, finger-like protuberance having five or six thick apical spines, and with area of elongate setae near end of valve and from inner surface of protuberance; anellus with broad anterior incision, with faint, Y-shaped median ridge, and with very long, tapering, pointed posterior protuberance, one and one-third times longer than anellus; paired structures of anellus large, subtriangular, with apices curved and pointed, length from anterior part of base to apex 1.0 mm.; cristae extremely long, 1.35 mm.; aedeagus 2.65 mm. in length, with sclerotized, faintly



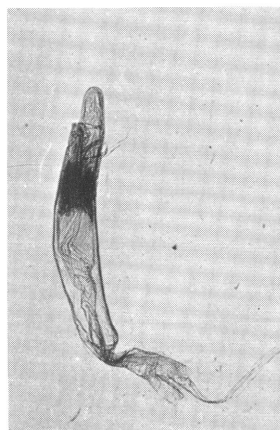
FIGS. 60-62. Male Genitalia. 60. *Salpis scodionata* Mabile, type, Punta Arenas, Magallanes Province, Chile (B.M. photo). 61. *Salpis albipunctaria* Mabile, Confluencia, Neuquén Province, Argentina, February 12, 1956 (Schajovskoy; B.M.). 62. *Salpis lancea*, new species, holotype, Q[uebrada] Chaquina, Tarapacá Province, Chile, September 23, 1951 (L. E. Peña; C.U.).



63



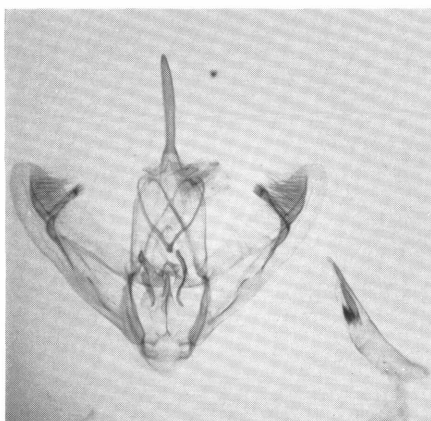
64



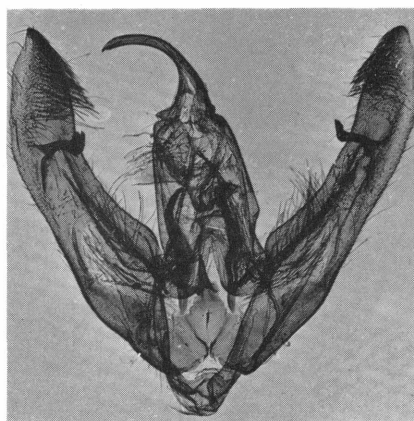
65

FIGS. 63–65. Male Genitalia. 63. *Salpis rubens* Prout, paratype, Zanjón Amarilla, Mendoza Province, Argentina, November 16, 1905 (W. M. Bayne; B.M.). 64. *Salpis carneitincta* Prout, holotype, Puente del Inca, Mendoza Province, Argentina (W. M. Bayne; B.M.; B.M. photo). 65. *Salpis puechi* (Dognin), Achacachi, La Paz [Department], Bolivia, September 18, 1899 (Garlepp; B.M.).





66



67

FIGS. 66, 67. Male Genitalia. 66. *Salpis brevis*, new species, paratype, Los Cipreces, Talca Province, Chile, January 14, 1968 (L. E. Peña; A.M.N.H.). 67. *Salpis orbifera* Prout, holotype, Cacheuta, Mendoza Province, Argentina, January (W. M. Bayne; B.M.; B.M. photo).

scoop-shaped posterior end; vesica extending at approximately 50-degree angle to aedeagus, with median, diagonal incomplete band of numerous, thin setae, and with one large, slightly curved, spine near apex of aedeagus, 0.6 mm. in length. Abdomen without row of setae on third segment.

**FEMALE GENITALIA:** Sterigma with large, bifurcate, winglike lamella antevaginalis, central area concave transversally, posterior margin with four dentate projections, increasing in size laterally, and with anterior margin rounded; ductus bursae broad, short, with right side longer than left; ductus seminalis arising ventrally near right side; corpus bursae with curved, sclerotized posterior portion having longitudinal striations on right side, anterior membranous portion globular, longer than posterior portion; signum large, situated dorsally, and projecting into corpus bursae; apophyses posteriores 1.65 mm. in length.

**TYPES:** Holotype, male, allotype, female, and two male paratypes, Q[uebrada] Chaquina, Iquique, Coliacagua Valley, elevation 4300 meters, [Tarapacá Province], Chile, September 23, 1951 (L. E. Peña). The genitalia of the holotype are on slide F.H.R. No. 15759, and of the allotype on No. 15848.

The holotype and allotype are in the entomological collection of Cornell University, their type No. 4578; the paratypes are in the collec-

tions of that institution and of the American Museum of Natural History.

**DISTRIBUTION:** Northern Chile, in the Andes Mountains (Tarapacá Province).

**TIME OF FLIGHT:** September.

**REMARKS:** Four specimens (three males and one female) and two genitalic dissections (one male and one female) have been studied.

The bifasciculate antennae of the males will distinguish this species from any of the preceding ones.

In the male genitalia, the single, finger-like protuberance from each valve, the longer, almost spearlike, process of the anellus, and the broader processes of the anellus will separate this species from the two Mabile species.

The large, dentate, winglike lamella antevaginalis is characteristic of the female genitalia.

#### ***Salpis unica*, new species**

Figures 54, 69, 70

**DIAGNOSIS:** This is a small, dark grayish brown species with well-defined, narrow, black cross lines on the upper surface of the forewings. The female genitalia are unique in the genus in that they do not have a signum.

**MALE:** Unknown.

**FEMALE:** Head with vertex brownish gray and with short pale gray scales; front pale gray, covered with long, brownish black hairlike scales; palpi dark grayish brown, with some

black scaling laterally; antennae simple. Thorax brownish gray above, paler below; legs pale gray, with variable number of grayish brown and black scales, especially on tarsi, terminal portions of segments white.

WINGS: Forewings elongate, rather slender; outer margins of all wings scarcely scalloped.

UPPER SURFACE OF WINGS: Forewings unicolorous dark grayish brown, with scattered grayish black scales; cross lines black, sharply defined; t. a. line arising one-fourth of distance from base on costa, W-shaped, meeting inner margin near base; discal dot absent; median line absent, but faint dark gray area present basad of t. p. line; latter arising three-fourths of distance from base on costa, bisinuate with two basal bends; subterminal area and veins in outer portion of wing, faintly brownish; terminal line absent; fringe concolorous with wing but having some white intravenular scaling, giving more or less checkered appearance. Hind wings concolorous with forewings but with less dark scaling; discal dot absent; extradiscal line weakly represented, becoming obsolescent anteriorly; terminal line and fringe similar to those of forewings.

UNDER SURFACE OF WINGS: Forewings pale gray or pale grayish brown, heavily suffused with dark grayish brown scales except for inner margin; hind wings pale gray, with scattered brownish black scales; discal dot obsolescent on forewing, small and double on hind wing; outer cross lines represented, that on hind wings by venular dots; terminal line absent; fringe concolorous with wings.

LENGTH OF FOREWING: 16 mm. (holotype).

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Sterigma with relatively short, broad, posteriorly bilobed lamella antevaginalis; ductus bursae with inner, somewhat funnel-shaped, sclerotized piece, and with much broader outer area tapering anteriorly and having sharply raised transverse ridges; ductus seminalis arising ventrally and just to right of junction of ductus bursae and corpus bursae; latter very long, posterior portion dorsoventrally curved, of even diameter, and with longitudinal striations, anterior portion swollen, tapering to caudal point; signum absent; apophyses posteriores 1.8 mm. in length.

TYPE: Holotype, female, Icalma, Cordillera Lonquimay, Andes Mountains, elevation 1050 to 1100 meters, southeastern Malleco Province,

Chile, January 2, 1968 (L. E. Peña). The genitalia of the holotype are mounted on slide F.H.R. No. 15581.

The holotype is in the collection of the American Museum of Natural History.

DISTRIBUTION: Andes Mountains of central Chile (Malleco Province).

TIME OF FLIGHT: January.

REMARKS: One specimen and one genitalic dissection have been studied.

The female genitalia of this species are unique in the shape of the ductus bursae and in the fact that there is no signum. Insofar as the genus *Salpis* is now understood, this is the only species to lack a signum. The exact placement of *unica* will have to await additional specimens, as a study of the male genitalia is needed for this purpose.

### ***Salpis rubens* Prout**

Figures 55, 63

*Salpis* [*Salpis*] *rubens* PROUT, 1910, p. 321, pl. 48, fig. 31 (male).

DIAGNOSIS: This is a small species, faintly pinkish brown in color, with pointed forewings having obscure cross lines. The genitalia are distinctive; see the key for details.

MALE: Head with vertex grayish brown; front brownish gray; palpi extremely long, rising to top of eye, third segment porrect, middle segment elongate, curving, grayish, long scaled below; antennae shortly fasciculate. Thorax grayish brown above, paler below; legs pale gray to grayish brown, with variable number of darker scales, especially on tarsi; hind tibia without hair pencil.

WINGS: Forewings elongate, apically produced; outer margins of all wings weakly scalloped.

UPPER SURFACE OF WINGS: Forewings unicolorous, faintly pinkish brown, with scattered dark grayish brown scales; cross lines weakly represented, usually somewhat obsolescent, and dark gray in color; t. a. line arising about middle of costa, appearing mostly as short, dark lines there, in center of wing, and above inner margin; discal dot and median line absent; t. p. line arising on costa seven-tenths of distance from base, with strong outward bend in center of wing, then sharply swinging basad, thence going with slightly outcurve to inner margin; terminal line absent; fringe concolorous with wing. Hind wings concolorous with forewings; discal dot

absent; extradiscal line weakly represented, complete, angled in lower portion of wing; basal line and fringe similar to those of forewings.

**UNDER SURFACE OF WINGS:** Unicolorous pale grayish brown, with a few scattered brown scales; discal dots absent; outer cross lines present on all wings; terminal line absent; fringe concolorous with wings.

**LENGTH OF FOREWING:** 16 to 17 mm.

**FEMALE:** Unknown.

**MALE GENITALIA:** Uncus 1.1 mm. in length, sides parallel, with tapering point, and dorsal surface with very slender, elongate setae; socius small; gnathos with slender, curved median area; each valve with S-shaped costa, swollen apically and with rounded apex, with large flattened protuberance having approximately six apical spines, central portion of valve having raised ridge and more heavily sclerotized ridge basad of, and connected to, protuberance, and with terminal area of very many, elongate setae; anellus slender, elongate, with modest anterior incision, with elongate median ridge, and with long, posteriorly rounded posterior protuberance, one-third of length of anellus; paired structures of anellus large, 1.35 mm. in length, flat, broadened medially and with slightly hooked apices; cristae extremely long, up to 2.0 mm.; aedeagus 3.1 mm. in length, with heavily sclerotized, faintly scoop-shaped posterior projection; vesica extending at approximately 50-degree angle to aedeagus, with several median spines and large partial band of numerous, slender, deciduous setae, and with one large spine near apex of aedeagus, 0.7 mm. in length, arising from elongate sclerotized basal area. Abdomen without row of setae on third segment.

**FEMALE GENITALIA:** Unknown.

**TYPE:** Holotype, male, in the collection of the British Museum (Natural History); its genitalia are mounted on Geometridae genitalia slide No. 7697.

**TYPE LOCALITY:** Zanjón Amarilla, Mendoza Province, Argentina.

**DISTRIBUTION:** Central Andes Mountains in Argentina (Mendoza Province).

**TIME OF FLIGHT:** November.

**REMARKS:** One paratype and one genitalic dissection have been studied. In addition, pictures of both the type and its genitalia have been examined.

***Salpis carneitincta* Prout**

Figures 56, 64, 71

*Salpis* [*Salpis*] *carneitincta* PROUT, 1910, p. 321.

**DIAGNOSIS:** This species is similar to *rubens*, but the forewings are shorter and broader, and they tend to have slightly more clearly defined maculation. The male antennae of *carneitincta* are said to be minutely pubescent, whereas these structures in *rubens* are fasciculate.

**FEMALE:** Head with vertex, front, and palpi similar to those of *rubens*; palpi slightly shorter, with third segment slanting upward; antennae simple. Thorax similar to that of *rubens*, but with legs tending to be concolorous with thorax. Abdomen brownish gray above, with scattered darker scales; slightly paler below.

**WINGS:** Forewings rather broad, with pointed apex; outer margins of all wings scalloped.

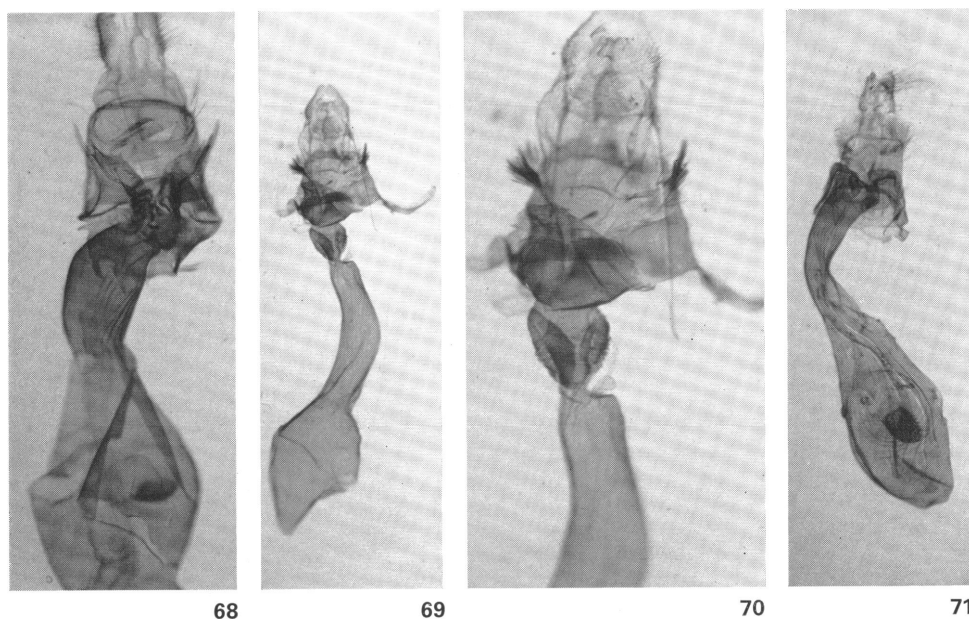
**UPPER SURFACE OF WINGS:** Forewings unicolorous, grayish brown to faintly pinkish brown, with some slightly darker brown scales; cross lines weakly represented, somewhat obsolescent, dark gray in color, and apparently similar in course to those of *rubens*; discal dot absent or very weakly represented; terminal line absent; fringe concolorous with wing. Hind wings concolorous with forewings; similar in maculation to those of *rubens*.

**UNDER SURFACE OF WINGS:** Unicolorous pale grayish brown; maculation similar to that of *rubens*.

**LENGTH OF FOREWING:** 16 to 18 mm.

**MALE:** Not examined. Prout said the antennae are "almost simple, minutely pubescent." From a color photograph of the type it appears that the hind tibia has a hair pencil. The upper surface of the wings are similar to those of the female, but have more dark scaling, particularly basad of the t. p. and extradiscal lines and in the subterminal area of all wings. The length of the forewing is 17 mm.

**MALE GENITALIA:** Not examined; the following notes are based on a photograph of the genitalia of the type. The genitalia are similar to those of *rubens*, but with the apex of valve slightly less swollen, with the valvular protuberance situated more distally, having a prominent row of setae basally, and being shorter than the terminal area of numerous setae. The anellus is broader, has a more triangular posterior protuberance; the paired structures of the anellus are apparently considerably smaller, scarcely attaining the anterior portion of the gnathos,



FIGS. 68-71. Female Genitalia. 68. *Salpis lancea*, new species, allotype, Q[uebrada] Chaquina, Tarapacá Province, Chile, September 23, 1951 (L. E. Peña; C.U.). 69, 70. *Salpis unica*, new species, holotype, Icalma, Malleco Province, Chile, January 2, 1968 (L. E. Peña; A.M.N.H.). 69. Genitalia. 70. Sterigma and ductus bursae. 71. *Salpis carneitincta* Prout, paratype, Puente del Inca, Mendoza Province, Argentina, March 16, 1905 (W. M. Bayne; B.M.).

and more slender. The aedeagus appears slightly thicker and more curved, but this may be due to its position on the slide.

**FEMALE GENITALIA:** Sterigma with lamella antevaginalis heavily sclerotized, with asymmetrical raised ridge having shallow, median indentation, and with dorsolateral, rounded sclerotized piece on each side; ductus bursae asymmetrical, left side weakly irregular, shorter than rounded right side; ductus seminalis arising on right side at junction of ductus bursae and corpus bursae; latter with slender, curved, sclerotized, longitudinally striated posterior portion, and with slightly swollen, elongate, membranous anterior portion having concentric raised ridges around signum; latter 0.7 mm. in length, pouchlike, and with punctate, sclerotized area posteriorly. Apophyses posteriores 2.0 mm. in length.

**TYPE:** The holotype, male, is in the collection of the British Museum (Natural History); its genitalia are mounted on Geometridae genitalic slide No. 7696.

**TYPE LOCALITY:** Puente del Inca, elevation 2720 meters, Mendoza Province, Argentina.

**DISTRIBUTION:** Central Andes Mountains of Argentina (Mendoza Province).

**TIME OF FLIGHT:** February and March.

**REMARKS:** The two paratype females have been examined, and the genitalia of one has been studied. Photographs of the type and its genitalia have also been examined.

*Salpis rubens* and *carneitincta* look very much alike, but they are distinct species. The shape of the wings, the nature of the male antennae, the presence of the tibial hair pencil in *carneitincta*, and the genitalia all can be used to separate the two. The time of flight of the moths appears to be different also, with *rubens* flying in November and *carneitincta* in February and March; however, much more collecting is needed to determine whether this is really so.

#### ***Salpis puechi* (Dognin)**

Figures 57, 65

*Lasiops* ? *puechi* DOGNIN, 1904, p. 368.

*Salpis* (*Salpis*) *puechi*: PROUT, 1910, pp. 320, 321.

**DIAGNOSIS:** This is a relatively small species with broadly triangular forewings having a pointed apex. The upper surface of the wings

is a finely irrorate brown and apparently variable in maculation. The male has simple antennae. The genitalia are distinctive; see the key for details.

**MALE:** Head with vertex pale brownish gray; front pale gray; palpi brownish gray, with some darker scaling; antennae simple. Thorax pale brownish gray above, paler below; legs grayish white, with variable number of brown scales, tarsi tending to be gray, and hind tibia with prominent hair pencil.

**WINGS:** Forewings elongate, broadly triangular, with pointed apex; outer margins of all wings weakly scalloped.

**UPPER SURFACE OF WINGS:** Forewings grayish brown, irrorate with grayish black scales; cross lines varying from grayish black, wide, and prominent to having t. a. line obsolescent and t. p. line indicated by grayish white venular dots; t. a. line arising on costa about two-fifths of distance from base, outwardly angled in cell, outwardly curved in cubital cell, with basal angles on veins; discal spot large, grayish black; median line absent; t. p. line arising on costa about three-fourths of distance from base, outwardly oblique to about middle of wing, swinging basally, then straight at right angle to inner margin, line dentate, with small to large whitish venular dots distad of line; terminal line absent; fringe concolorous with wing. Hind wings concolorous with forewings but having fewer dark irrorations basally and anteriorly; discal dot present, smaller than that of forewing; extradiscal line broad, fading out anteriorly; terminal line absent; fringe concolorous with wing.

**UNDER SURFACE OF WINGS:** All wings pale grayish brown, with scattered brown scales; forewings with diffuse discal dot weakly represented, and with t. p. line in upper portion of wing only; hind wings with larger discal dot and complete extradiscal line; terminal line and fringe similar to those of upper surface.

**LENGTH OF FOREWING:** 17 to 18 mm.

**FEMALE:** Unknown.

**MALE GENITALIA:** Uncus elongate, 1.3 mm. in length, very slightly swollen beyond middle, apex pointed; socius moderate in size; gnathos with slender, curved median area; valve with weakly S-shaped costa, and with bluntly pointed apex, with broad, sclerotized, flattened projection not attaining costal margin, bearing six or seven, broad, wedge-shaped spines terminally and with row of setae basad of projection, and

area of elongate setae between projection and apex of valve; anellus with large, roughly triangular anterior portion having small anterior incision and median ridge, posteriorly extended as broad protuberance having wide median shoulder-like projection, with length of protuberance less than length of anterior portion; paired structures of anellus 0.9 mm. in length, relatively slender and straight, with weakly curved apex and with irregularly dentate posterodorsal margin; cristae elongate; aedeagus 2.9 to 3.0 mm. in length, slightly curved, with posterior end rounded; vesica extending at about 60-degree angle to aedeagus, with one, thick, short, curved spine at apex of aedeagus and with small rounded sclerotized piece near the base, medially with one elongate (0.8 mm. in length), thick spine and from four to seven thinner, shorter setae in transverse row, plus incomplete band of deciduous spines. Abdomen ventrally with two lateral patches of setae on third segment.

**FEMALE GENITALIA:** Unknown.

**TYPE:** Dognin described *puechi* from a single male; it is U.S.N.M. No. 31693, and has the genitalia mounted on slide D.C.F. No. 1394.

**TYPE LOCALITY:** "La Paz, Pérou." The only La Paz, Peru, listed in the "Index to map of Hispanic America 1:1,000,000" is a small settlement on the banks of the Rio Ucayali in the Department of Loreto, at an elevation of from 100 to 200 meters. Based on the high mountain or very southern distribution of all of the other known members of this genus, it is believed that the Peruvian locality is in error. It seems much more likely that Dognin meant La Paz, Bolivia. This opinion is strengthened by the fact that the locality of the second specimen studied is Achacachi, La Paz [Department], Bolivia; this town is at an elevation of over 3800 meters.

**DISTRIBUTION:** Bolivia (Department of La Paz).

**TIME OF FLIGHT:** September.

**REMARKS:** Two male specimens and two genitalic dissections have been studied, including those of the type.

The upper surface of the wings is a lighter, sandier color than is that of the preceding species. The amount of what is presumed to be individual variation between the two specimens studied is very great. The type is slightly paler and has weakly developed cross lines, with the t. a. line obsolescent and the t. p. and extradiscal lines consisting primarily of a row of grayish white dots. The second specimen, in the

collection of the British Museum and definitely from Bolivia, has all the cross lines grayish black and clearly defined.

***Salpis brevis*, new species**

Figures 58, 66

**DIAGNOSIS:** This species can be distinguished from all the preceding ones in this group by the fact that the male antennae are pectinate. This is a large species that has broad brownish gray wings.

**MALE:** Head, vertex and front pale brownish gray or gray; palpi rising to middle of eye, dark gray; antennae shortly pectinate, with longest pectinations 0.6 mm. in length. Thorax pale brownish gray or pale gray above, paler below; forelegs and middle legs gray or grayish brown, hind legs white with gray tarsi and without hair pencil. Abdomen pale brownish gray, with scattered darker scales; paler below.

**WINGS:** Forewings broad, with bluntly pointed apex; outer margins of all wings weakly scalloped.

**UPPER SURFACE OF WINGS:** Forewings unicolorous brownish gray, with scattered grayish black scales; t. a. line absent or obsolescent; discal dot small; median line absent; t. p. line arising on costa four-fifths of distance from base, subparallel to outer margin and with basal bend above inner margin, represented mainly by whitish venular dots; terminal line weakly represented; fringe concolorous with wing. Hind wings concolorous with forewings but with basal area slightly paler gray; discal dot present; extradiscal line weakly represented, more or less obsolescent anteriorly; terminal line grayish black; fringe concolorous with wing.

**UNDER SURFACE OF WINGS:** Forewings pale brownish gray, becoming pale gray above inner margin; hind wings pale gray; all wings with some grayish brown scaling in outer portions; discal dots and outer cross lines present on all wings; terminal line obsolescent; fringe brownish gray on all wings.

**LENGTH OF FOREWING:** 18 to 20 mm.; holotype, 19 mm.

**FEMALE:** Unknown.

**MALE GENITALIA:** Uncus elongate, 1.3 to 1.4 mm. in length, very slightly swollen beyond middle, apex pointed; socius small; gnathos with elongate, slender, curved median area; valve with broad, straight costa, with narrow, sclerotized, terminally shortly setose, finger-like

protuberance arising from raised sclerotized ridge in outer portion of valve, and with area of elongate setae from or near outer end of ridge; anellus relatively narrow, elongate, with broad anterior incision, with median sclerotized ridge extending length of anellus and terminating as sagittate posterior protuberance, the latter with length greater than that of anellus; paired structures of anellus 0.7 mm. in length, with basal portion slightly curved and with strong median bend, apex rounded; cristae absent; aedeagus 1.8 to 2.2 mm. in length, gently tapering posteriorly to blunt point; vesica with two elongate spines and area of spicules. Abdomen without ventral row of setae on third segment.

**FEMALE GENITALIA:** Unknown.

**TYPES:** Holotype, male, La Vinilla, Cordillera Curicó, Andes Mountains, Curicó Province, Chile, February 14–18, 1961 (L. E. Peña). The genitalia of the holotype are mounted on slide F.H.R. No. 13188. Paratypes, all from Chile: Same data as holotype, one male; El Alfalfal, on Río Colorado, Santiago Province, March 1, 1968 (L. E. Peña), one male; Los Cipreces, high mountains in Talca Province, January 14, 1968 (L. E. Peña), one male.

All the type material is in the collection of the American Museum of Natural History.

**DISTRIBUTION:** Andes Mountains of central Chile (provinces of Santiago, Curicó, and Talca).

**TIME OF FLIGHT:** January, February, and March.

**REMARKS:** Four specimens (all males) and two genitalic dissections have been studied.

The single moth from the high mountains in Talca Province has the upper surface of the wings more heavily suffused with grayish black scales than do the other three specimens.

The male genitalia of *brevis* can be separated from those of the preceding species by its much shorter aedeagus, and by the single, slender, nontapering, terminally shortly setose, finger-like projection arising from the outer portion of each valve.

***Salpis orbifera* Prout**

Figures 59, 67

*Salpis (Antygophanes) orbifera* PROUT, 1910, p. 324, pl. 48, fig. 23 (male).

No specimens of this species have been examined; as far as known, *orbifera* is represented only by the unique male type in the collection of the



British Museum (Natural History). The following descriptive notes are based on Prout's original description and colored figure, and a photograph of the type. This is a small brown species with the length of the forewing about 14 mm. The antennae have very short subclavate pectinations. The terminal joint of the palpus is not elongate and fusiform, as it is in most species of *Salpis*. The slender abdomen extends well beyond the hind wings. The forewings are elongate, and the outer margins of all the wings are nearly smooth. On the upper surface, the t. a. line is almost obsolete; there is a large, circular discal spot; the t. p. line is somewhat wavy and subparallels the outer margin; the fringe is concolorous with the wing but has paler scaling between the vein endings. The hind wings are without maculation except for a small discal spot and an incomplete, faint, extradiscal line. The under surface of the wings is paler than the upper, all wings have a faint outer cross line, and the hind wings have a small discal spot.

A photograph of the genitalia of the type has been furnished me by Fletcher. The uncus is elongate and curved. The gnathos has a moderate median projection. Each valve is elongate and slender, being apically pointed; the projecting armlike process is angled terminally. The anellus is relatively small, and bears an elongate, pointed posterior projection that is shorter than the anellus. The paired processes are very long and slender, and are curved apically. The aedeagus is weakly tapering; the vesica has the incomplete band of spicules and what appears to be some spines.

The type locality is Cacheuta, elevation 1245 meters, Mendoza Province, Argentina; the type was caught in mid-January.

The shape of the valves is unlike that of any other species in group III. The only other known species that approximates this outline are *eudora* and *felderi*, both of which are in group I.

#### GROUP IV

The male moths of this group have genitalia in which the exerted vesica continues in the same direction as the aedeagus, or very nearly so. All species have strongly dentate tips to the processes of the anellus, and most species have a large, strongly setose terminal area on each valve. The anellus is broad, without a central ridge, and with the posteromedial portion vary-

ing from being flat to having a slender, elongate extension.

The female genitalia have a more or less well-sclerotized lamella antevaginalis; in some of the species they are quite large and have the posterior margin variably dentate. The ductus bursae is usually fused with the corpus bursae. The ductus seminalis may arise ventrally, on the right side, or dorsally. The corpus bursae varies from moderate length to very long. The signum varies from moderate to large, and may be ventral, on the right side, or dorsal.

The moths are, with one exception, the largest in the genus. The length of the forewings of the males varies from 17 to 23 mm., and of the females from 18 to 25 mm.; for the smallest species, the corresponding figures are 16 to 17 mm., and 17 to 18 mm. The wings are broad, with the apex of each forewing pointed or weakly attenuate. The upper surface of the concolorous fore and hind wings ranges in color from brown to gray. The antennae are very long, extending about three-fourths the length of the forewings. The males have either pectinate or simple antennae, and those of the females are serrate or simple. The males may or may not possess the tibial hair pencil and the row of setae on the ventral surface of the third abdominal segment.

The following seven species are included: *penai*, *glabra*, *clarkei*, *occulta*, *antennata*, *aenea*, and *tuberata*.

#### *Salpis penai*, new species

Figures 72, 79, 86

DIAGNOSIS: This is the only species in this group that has the upper surface of the wings light gray; the cross lines are usually distinct. The antennae of the male are pectinate.

MALE: Head with vertex long scaled, pale gray, becoming white between antennal bases; front brownish black dorsally and laterally, pale gray medially and ventrally; palpi rising to middle of eye, with relatively short third segment, grayish brown, with white scaling on last segment and on inner surface of palpi; antennae shortly pectinate, longest pectinations 0.4 mm. in length, and with basal portion of scape white. Thorax pale gray above, with a few grayish brown scales; paler below; legs whitish gray, with considerable brownish gray and grayish black scaling, with fore tibia and all tarsi grayish black except for broad white bands at ends of

segments, and with hair pencil on hind tibia. Abdomen pale gray, with numerous grayish brown scales, above and below.

**WINGS:** Forewings broad, apex pointed, and with broadly rounded outer margin; outer margins of all wings scalloped.

**UPPER SURFACE OF WINGS:** Forewings pale gray, more or less evenly and heavily covered with brownish gray scales; cross lines complete, dark gray; t. a. line arising on costa about three-tenths of distance from base, crossing costa at right angle, then broadly outwardly curved across wing, with inward tooth on anal vein; discal dot present; median shade line situated near t. p. line and paralleling it, passing very close to discal dot; t. p. line arising on costa four-fifths of distance from base, subparalleling outer margin, inwardly dentate and somewhat strengthened on veins; s. t. line broad, nebulous, more or less complete; terminal line very slender except for intravenular dots; fringe checkered, concolorous with wing, and having grayish black scaling at ends of veins. Hind wings concolorous with forewings, but with fewer brownish gray scales in basal portion of wing; discal dot more prominent than that on forewing; median shade line obsolescent; extradiscal line complete, similar to t. p. line; s. t. line present in lower portion of wing; terminal line and fringe similar to those of forewings.

**UNDER SURFACE OF WINGS:** Pale gray, with variable number of grayish brown scales, these particularly concentrated on outer portion of forewings near apex; discal dots and outer cross lines present on all wings; terminal line and fringe similar to those of upper surface.

**LENGTH OF FOREWING:** 16 to 17 mm.; holotype, 16 mm.

**FEMALE:** Similar to male; antennae with basal portion simple, becoming weakly serrate medially; upper surface of wings tending to have slightly more brownish gray scaling and to have less clearly defined cross lines than in male.

**LENGTH OF FOREWING:** 17 to 18 mm.; allotype, 17 mm.

**MALE GENITALIA:** Uncus slender, 1.05 mm. in length, with weak ventral keel becoming bifurcate posteriorly; socius present; gnathos U-shaped, with large, raised, dentate median area; valve with costa either straight or concave, apex rounded, and with weakly sclerotized, diffuse, transverse area near base on inner face; anellus rhomboidal, median area raised and with

posterior longitudinal keel, and having sclerotized strip connecting to base of each valve; paired structures of anellus 0.65 mm. in length, posterior portion heavily sclerotized, broad basally but curving posteriorly and tapering to point, with inner surface spinose; cristae sparse, short; aedeagus 2.5 mm. in length, slightly curved, with broadly sclerotized posterior end tapering to sharp point; vesica with single, elongate, curved spine near end of aedeagus, arising from sclerotized plate, and with semi-circular band of numerous, elongate, thin setae. Abdomen without ventral row of setae on third segment.

**FEMALE GENITALIA:** Sterigma with narrow, transverse, sclerotized band, enlarged and projecting posteriorly at sides of segment, and with ventral membranous strip; ductus bursae slightly wider than long, asymmetrical, with anterior and posterior portions curving to left; ductus seminalis arising medioventrally; corpus bursae with weakly sclerotized, longitudinally striate, gently curved posterior portion, and with globular, membranous anterior portion; signum 0.4 mm. in length, situated on right side or ventrally, with posterior opening, and with short spinose projections on inner surface; apophyses posteriores 1.5 mm. in length.

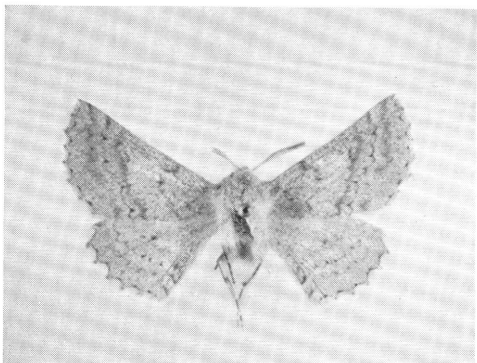
**TYPES:** Holotype, male, Recinto, elevation 800 meters, Ñuble Province, Chile, November 30, 1951 (L. E. Peña); allotype, female, El Manzano, elevation 2400 meters, Santiago Province, Chile, October 25–28, 1951 (L. E. Peña). The genitalia of the holotype are mounted on slide F.H.R. No. 15753, and of the allotype on No. 15844. Paratypes, all from Chile: Atacalco, Río Diguillin, Ñuble Province, December 2, 1951 (L. E. Peña), one male; Los Pellines, Río Crillan, Ñuble Province (L. E. Peña), one male; El Manzano, Santiago Province, October 25–28, 1951 (L. E. Peña), one male and one female.

The holotype and allotype are in the entomological collection of Cornell University, bearing their type No. 4579; paratypes are in the collections of that institution and of the American Museum of Natural History.

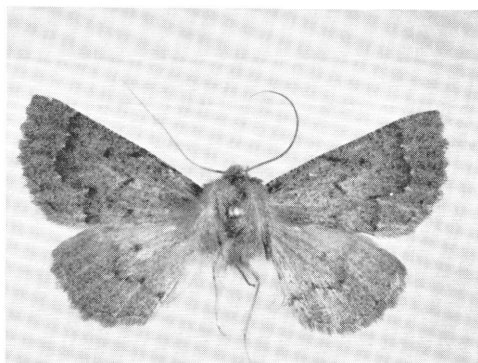
**DISTRIBUTION:** Andes Mountains of central Chile (provinces of Santiago and Ñuble).

**TIME OF FLIGHT:** October, November, and December.

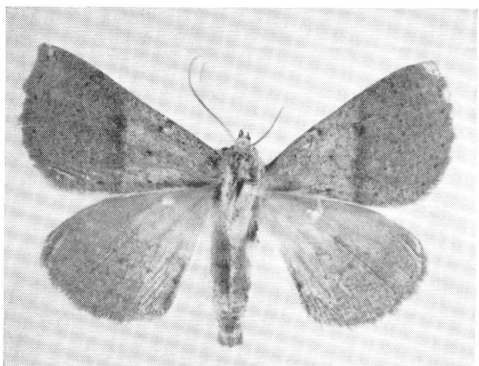
**REMARKS:** Six specimens (four males and two females) and three genitalic dissections (two



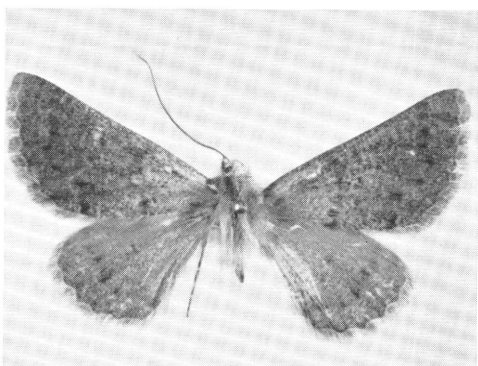
72



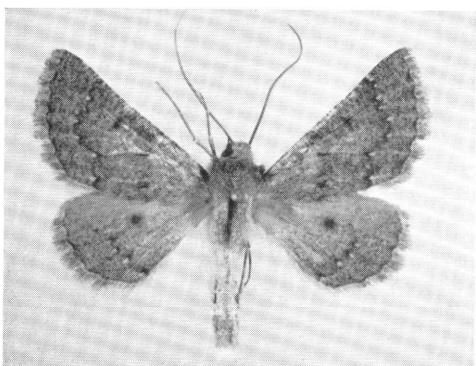
73



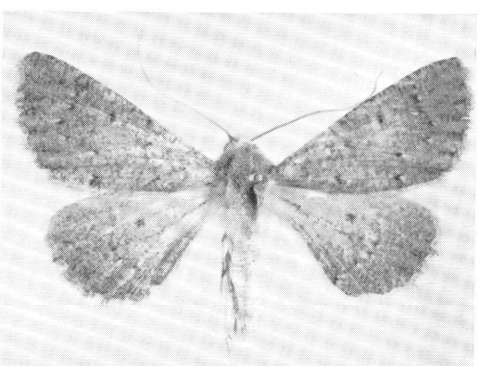
74



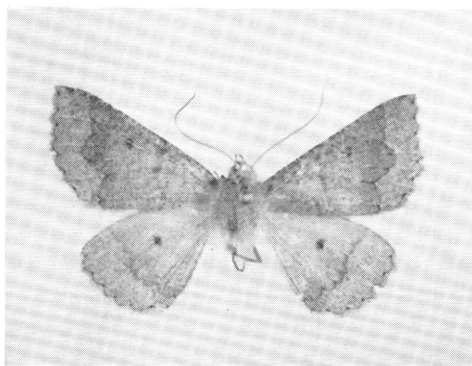
75



76



77



78

males and one female) have been studied.

This species is not particularly closely related to the other members of this species group.

**ETYMOLOGY:** It is with great pleasure that I name this species after Luis E. Peña G., of Santiago, Chile, who not only collected all the known specimens of this species, but many of the specimens studied for this revision.

***Salpis glabra*, new species**

Figures 73, 80, 87

**DIAGNOSIS:** This species is large in size, the forewings are broad, and has the upper surface of the wings dark grayish brown. The hind tibia of the male is slender and lacks the hair pencil. The genitalia are distinctive; see the key for details.

**MALE:** Head with vertex and front pale gray to dark grayish brown; palpi with third segment very long, rising to about middle of eye, varying from pale gray to brownish black; antennae simple. Thorax dark grayish brown above; below pale gray to grayish brown; legs pale gray with dark brown scales, all tarsi tending to be darker gray, and hind tibia slender, without hair pencil. Abdomen gray above, paler below, with scattered brownish black scales.

**WINGS:** Forewings broad, apex pointed, and with rounded outer margin; outer margins of all wings scalloped.

**UPPER SURFACE OF WINGS:** Forewings dark grayish brown, with scattered pale gray and brownish black scales; cross lines grayish black; t. a. line arising on costa one-third of distance from base, outwardly curved or angled in cells, basally angulate on veins; discal dot present, varying from small to large in size; median shade line absent; t. p. line arising on costa seven-tenths of distance from base, running slightly outwardly oblique to middle of wing, then with basal bend to vein  $Cu_2$ , thence proceeding at right angle to inner margin, with line tending to

be somewhat strengthened and to have slight basal indentations filled with white scales on veins; terminal line slender or obsolescent; fringe concolorous with wing. Hind wings concolorous with forewings; discal spot large; extradiscal line complete or fading out anteriorly, meeting costal margin in middle, in posterior portion of wing tending to have distal white venular spotting; terminal line and fringe similar to those of forewings.

**UNDER SURFACE OF WINGS:** Pale gray, more or less heavily overlain with dark grayish brown scales except along inner margin of forewings; discal spots present on all wings, those of hind wings sometimes very large (1.5 mm. in diameter); outer cross lines present, in some specimens quite broad and prominent, especially on hind wings; terminal line very narrow or obsolescent; fringe concolorous with wing.

**LENGTH OF FOREWING:** 18 to 21 mm.; holotype, 18 mm.

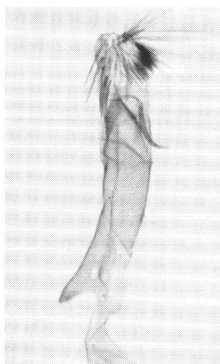
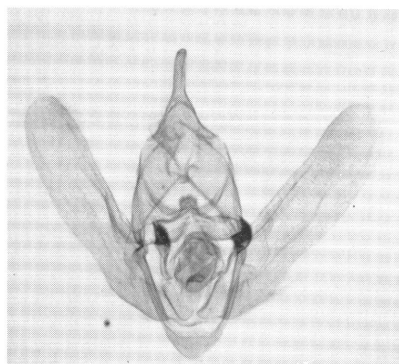
**FEMALE:** Similar to male; antennae simple.

**LENGTH OF FOREWING:** 19 to 21 mm.; allotype, 21 mm.

**MALE GENITALIA:** Uncus slender, tapering, curved, 1.4 to 1.6 mm. in length; socius moderate, with elongate setae; gnathos with pointed median area; valve with costa weakly swollen beyond middle, with relatively small, more or less square, membranous area medially at base on inner face, with outer portion of valve simple but bearing large group of elongate setae; anellus with moderate median incision anteriorly, with posterior margins concave, and with median area extended; paired structures of anellus small, 0.5 to 0.6 mm. in length, becoming curved and heavily sclerotized posteriorly, apex serrate; cristae elongate; aedeagus 2.6 to 2.8 mm. in length, slightly curved, and with elongate, slender, pointed posterior end; vesica with oblique row of several small spines and two much thicker anterior spines; and with incomplete

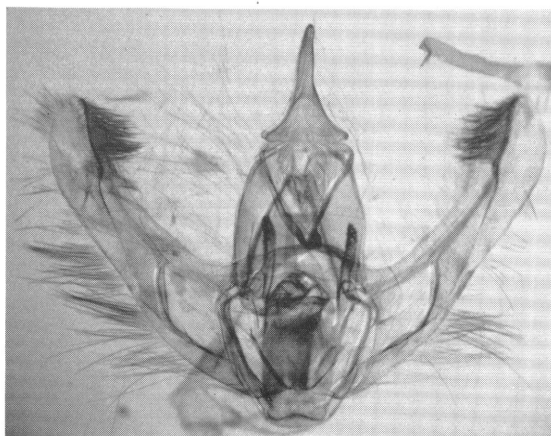
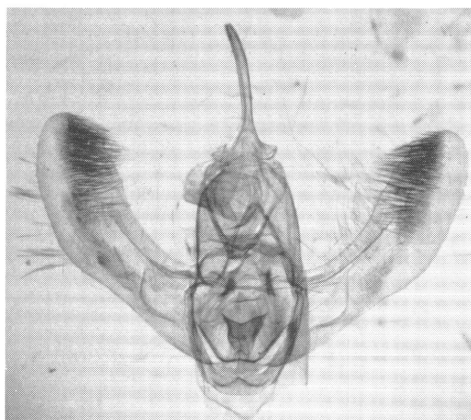
---

FIGS. 72-78. Adults. 72. *Salpis penai*, new species, holotype male, Recinto, Ñuble Province, Chile, November 30, 1951 (L. E. Peña; C.U.). 73. *Salpis glabra*, new species, holotype male, Liucura, Malleco Province, Chile, January 10, 1959 (L. E. Peña; A.M.N.H.). 74. *Salpis clarkei* Sperry, male, Los Maitenes, Santiago Province, Chile, March 2, 1964 (L. E. Peña; A.M.N.H.). 75. *Salpis occulta*, new species, holotype female, Los Hedionditas, Coquimbo Province, Chile, January 11, 1966 (L. E. Peña; A.M.N.H.). 76. *Salpis antennata* Mabille, male, Chapelka, Neuquén Province, Argentina, February 26, 1952 (N. Petronsky; A.M.N.H.). 77. *Salpis aenea* (Butler), male, Los Maitenes, Santiago Province, Chile, March 2, 1964 (L. E. Peña; A.M.N.H.). 78. *Salpis tuberata*, new species, holotype male, near El Pangué, Coquimbo Province, Chile, November 23, 1961 (L. E. Peña; A.M.N.H.). All  $\times 1.5$



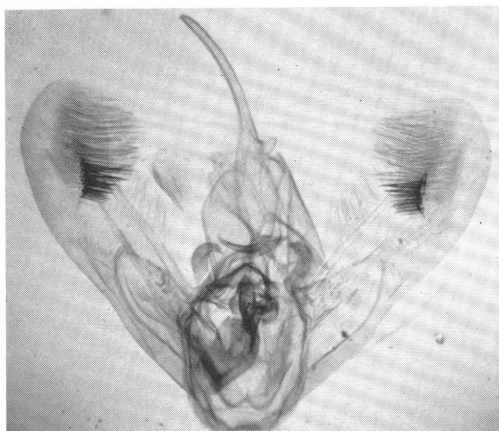
79

80

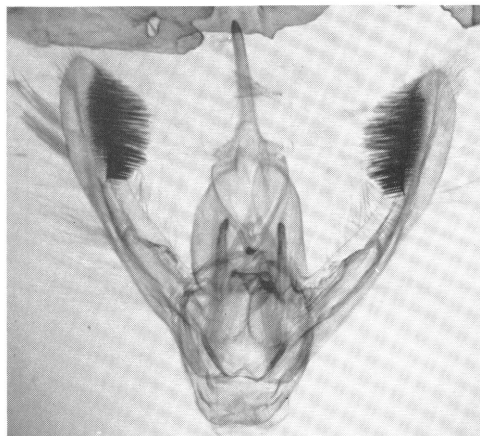
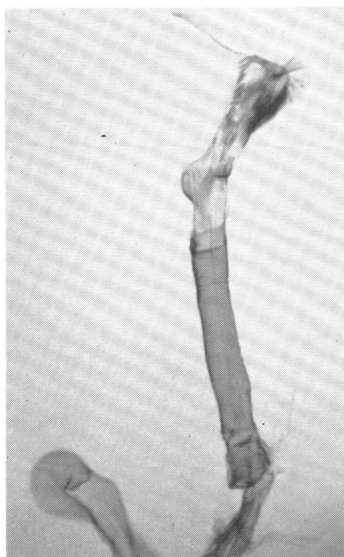
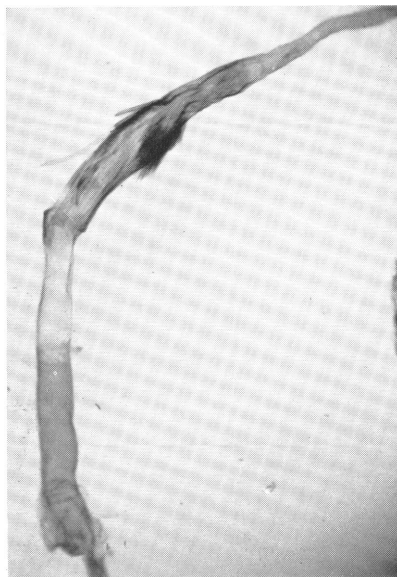


81

FIGS. 79-81. Male Genitalia. 79. *Salpis penai*, new species, holotype, Recinto, Ñuble Province, Chile, November 30, 1951 (L. E. Peña; C.U.). 80. *Salpis glabra*, new species, paratype, San Martín de los Andes, Neuquén Province, Argentina, February, 1952 (S. Schajovskoy; A.M.N.H.). 81. *Salpis clarkei* Sperry, Los Maitenes, Santiago Province, Chile, March 2, 1964 (L. E. Peña; A.M.N.H.).



82



83

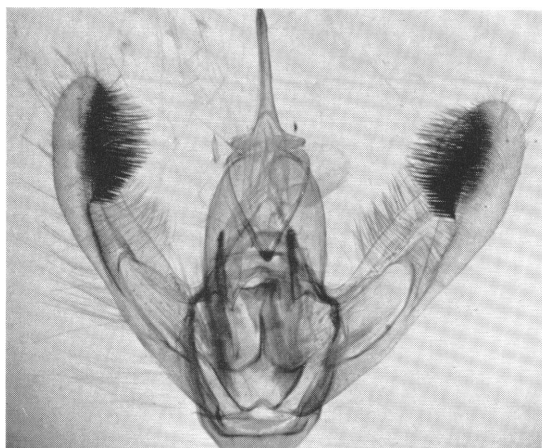
FIGS. 82, 83. Male Genitalia. 82. *Salpis occulta*, new species, paratype, El Manzano, Santiago Province, Chile, February 9, 1961 (L. E. Peña; C.U.). 83. *Salpis antennata* Mabilie, Comodoro Rivadavia, Chubut Province, Argentina, December 2, 1952 (J. Foerster; A.M.N.H.).

band of numerous, elongate, thin setae. Abdomen without ventral row of setae on third segment.

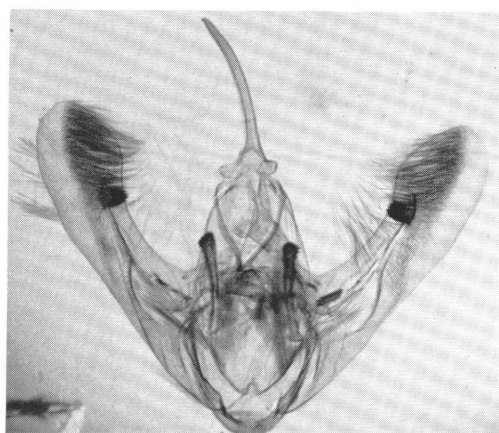
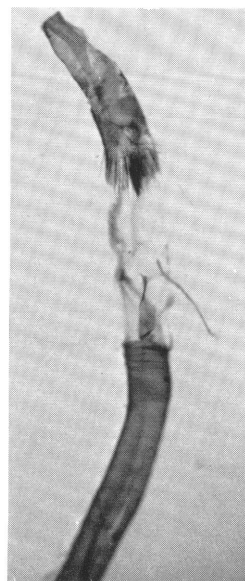
**FEMALE GENITALIA:** Sterigma not differentiated except as narrow, lateral, sclerotized areas extending to apophyses anteriores; ductus bursae short, small, sclerotized, surrounded by posterior end of corpus bursae; ductus seminalis arising

near posterior end of corpus bursae ventrally on right side; corpus bursae with short bulbous posterior end, with short sclerotized area to left of ductus bursae and with several short longitudinal striations, then with short neck and swollen, membranous anterior portion; signum 0.2 to 0.3 mm. in length, situated ventrally, with posterior opening, and with variable number of

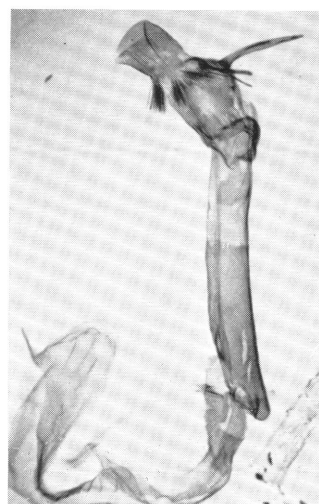




84



85



FIGS. 84, 85. Male Genitalia. 84. *Salpis aenea* (Butler), Los Maitenes, Santiago Province, Chile, March 2, 1964 (L. E. Peña; A.M.N.H.). 85. *Salpis tuberrata*, new species, holotype, near El Pangué, Coquimbo Province, Chile, November 23, 1961 (L. E. Peña; A.M.N.H.).

short spinose projections dorsally and around margins; apophyses posteriores 2.5 to 2.8 mm. in length.

Types: Holotype, male, Liucura, Lonquimay area, Andes Mountains, Malleco Province, Chile, January 10, 1959 (L. E. Peña); allotype, female, 15 kilometers west of Angol, elevation 600 meters, Malleco Province, Chile, February 17, 1956 (L. E. Peña). The genitalia of the holotype are mounted on slide F.H.R. No.

13264, and of the allotype on No. 15766. Paratypes: *Chile*: Los Cipreces, high mountains in Talca Province, January 14, 16, 1968 (L. E. Peña), one male, one female; La Vinilla, Cordillera Curicó, Andes Mountains, Curicó Province, February 14–18, 1961 (L. E. Peña), one male; Río Teno, mountains of northeastern Curicó Province, January 25–27, 1968 (L. E. Peña), two females; El Manzano, elevation 2800 meters, Santiago Province, February 10,



1951 (L. E. Peña), one male, one female; Guayacan, Canelo, elevation 900 meters, Santiago Province, January, 1951 (L. E. Peña), one male. *Argentina*: Lake Nanthúe, Neuquén Province, January 20, 1952, February 21, 1952 (S. Schajovskoy), two males; San Martín de los Andes, Neuquén Province, February, 1952, February 16, 22, 1952, March, 1950, October, 1952, December 1, 1951 (S. Schajovskoy), nine males and one female; Neuquén Province, December 1, 1951 (S. Schajovskoy), one male, one female; Lago Lacar, Neuquén Province, February 27, 1953, March 2, 3, 1952 (N. Petronsky), two males, one female; Pucara, Neuquén Province, February 15, 1953 (S. Schajovskoy), one male; Chapelka, Neuquén Province, February 20 (N. Petronsky), one female; Pulmarí, Parque Nacional Lanin, February, 1950 (Schajovskoy), two males; Nahuel Huapi, Río Negro Province, four males, two females; Comodoro Rivadavia, Chubut Province, December 14–30, 1951 (J. Foerster), four males, one female; Valley del Lago Blanco, Chubut Province (Thursby), two males.

The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of that institution, of the British Museum (Natural History), and of Cornell University.

**DISTRIBUTION:** Central Chile, in the Andes Mountains (the provinces of Santiago, Curicó, Talca, and Malleco). In Argentina, *glabra* occurs in both the mountainous regions (the provinces of Neuquén and Río Negro) and along the coast (Chubut Province).

**TIME OF FLIGHT:** October, December, January, February, and March.

**REMARKS:** Forty-four specimens (30 males and 14 females) and 13 genitalic dissections (six males and seven females) have been studied.

This widely ranging species does not show much geographic variation, even though it occurs from sea level up into the Andes Mountains, at least as high as 2800 meters.

#### ***Salpis clarkei* Sperry**

Figures 74, 81, 88

*Honorana notaturia* auct.: BUTLER, 1882, p. 365.

*Salpis clarkei* SPERRY, 1951, p. 162.

**DIAGNOSIS:** This species is large in wingspread; the broad forewings tend to be gray basally and grayish black in the outer half. The hind tibia of the male is slender and lacks the hair pencil. The

genitalia are distinctive; see the key for details.

**MALE:** Head with vertex pale gray; front grayish black; palpi rising to about middle of eye, grayish black, with some pale gray scales distally and on inner surface; antennae simple. Thorax pale gray above, with a few terminally spatulate, black-tipped scales; grayish white below, legs pale gray, with scattered brown scales, and with hind tibia slender, lacking hair pencil. Abdomen pale gray with scattered dark brown scales above and below.

**WINGS:** Forewings broad, apex pointed, and with rounded outer margin; outer margins of all wings weakly scalloped.

**UPPER SURFACE OF WINGS:** Forewings with basal half pale gray, terminal half dark gray or dark grayish brown, with nebulous, slightly curving, dark median shade band serving as line of demarcation; t. a. line varying from costal dash and two venular dots to almost complete, irregular in course, having large outward loop in cubital cell; discal spot dark gray, tending to be large, with a few pale gray scales medially; t. p. line varying from obsolescent to a series of more or less connected venular dots, concave in cells, and with some white scaling on veins distad of dots; terminal line represented by small intravenular dots; fringe concolorous with wing. Hind wings light gray basally, becoming darker gray or grayish brown in outer portion of wing; discal dot small; extradiscal line obsolescent to complete but weakly represented, weakly curved across wing; terminal line absent; fringe concolorous with wing.

**UNDER SURFACE OF WINGS:** Pale gray, with variable number of brownish gray and scattered dark brown scales; discal dots small, present on all wings; outer cross lines weakly represented or absent; terminal intravenular dots obsolescent; fringe concolorous with wings.

**LENGTH OF FOREWING:** 18 to 21 mm.

**FEMALE:** Similar to male; antennae simple; upper surface of forewings tending to be more unicolorous gray; both upper and under surfaces tending to have less maculation than in male.

**LENGTH OF FOREWING:** 20 to 25 mm.

**MALE GENITALIA:** Uncus relatively short and wide, 1.2 mm. in length; socius small; gnathos with elongate, broadened median area; valve with costa swollen at two-thirds distance from base, with large membranous area medially at base on inner face roughly triangular in outline,

with terminal portion of valve having median longitudinal ridge and group of setae arising therefrom; anellus with small median anterior incision, and with truncate posterior margin; paired structures of anellus 0.6 to 0.7 mm. in length, slender, curved, with serrate dorsal margin for about one-half of length; cristae very long; aedeagus 3.5 to 3.7 mm. in length, posterior end sclerotized, slightly tapering; vesica, when exerted, extending along axis of aedeagus, with single, slightly oblique ventral row of six to eight spines, the anterior two being much thicker than others, with from nine to 12 longer spines situated around posterior end of oblique row, and with broad dorsal incomplete band of spicules. Abdomen without ventral row of setae on third segment.

**FEMALE GENITALIA:** Sterigma with very large, sclerotized lamella antevaginalis, with small to moderate median incision, and with sides strongly produced anterodorsally, with small dorsoventral flange along posterior margin of ductus bursae; latter short, narrowed medially, with inner portion sclerotized; ductus seminalis arising ventrally, extending to right side; corpus bursae very large, posterior portion smoothly sclerotized, then membranous anterior portion gradually increasing in size; signum large, varying from 0.5 to 0.9 mm. in length, situated either ventrally or dorsally, purselike, with posterior opening, and with numerous short spinose projections on inner surface and around margins; apophyses posteriores 2.6 to 3.5 mm. in length.

**TYPES:** The holotype, male, is in the collection of the United States National Museum; the allotype, female, is in the American Museum of Natural History.

**TYPE LOCALITY:** El Canelo, Cajon de Maipo, Andes Mountains, Santiago Province, Chile.

**DISTRIBUTION:** Central Chile. Practically all the moths examined are from the Andes Mountains in the provinces of Santiago and O'Higgins; the only labels bearing elevation data were for 900 and 1100 meters. A single specimen from the Edmonds collection, now in the British Museum (Natural History), presumably represents Butler's *Honorana notaturia*; the locality given in that reference is the "mountains of the hacienda of Cauquenes," in Maule Province.

**TIME OF FLIGHT:** January and March.

**REMARKS:** Thirty-two specimens (17 males, including the holotype, and 15 females) and six

genitalic dissections (two males and four females, including the allotype) have been studied.

The large size and the bicolored forewings will normally serve to distinguish this species. Occasional specimens have more or less unicolorous forewings, but their genitalia are indistinguishable from others of this species.

### ***Salpis occulta*, new species**

Figures 75, 82, 89

**DIAGNOSIS:** This is a large, brown species with elongate forewings. The maculation of the upper surface of the wings is weakly represented. The genitalia of both sexes have good specific characters; see the key for details.

**MALE:** Head with vertex pale gray or light grayish brown; front grayish white; palpi elongate, rising to middle of eye, grayish white with numerous brownish black scales laterally; antennae simple. Thorax gray above, paler below; legs dull gray, with darker scaling on tarsi; hind tibia with prominent hair pencil.

**WINGS:** Forewings elongate, with apex produced; outer margins of all wings scalloped.

**UPPER SURFACE OF WINGS:** Forewings unicolorous light to dark grayish brown, with evenly scattered blackish brown scales; cross lines weakly represented; t. a. line arising on costa one-third of distance from base, having moderate outward loops in cells, and somewhat strengthened as spot on anal vein; discal spot elongate or rounded; median line absent; t. p. line arising on costa about three-fourths of distance from base, appearing as brownish black venular dots subparalleling outer margin, with slight outward bow in middle of wing and with basal bend on vein  $Cu_2$ , and with white scaling distad of venular dots; terminal line absent; fringe slightly paler than wing. Hind wings concolorous with forewings but having fewer blackish brown scales; discal dot present; extradiscal line complete, nebulous, with or without white venular scaling; terminal line and fringe similar to those of forewings.

**UNDER SURFACE OF WINGS:** Pale brownish gray or grayish white, with scattered brown scales; discal dots weakly represented on forewings, large and round on hind wings; outer cross lines similar in course to those of upper surface but broader; terminal line and fringe similar to those of upper surface.

LENGTH OF FOREWING: 19 to 20 mm.; allotype, 20 mm.

FEMALE: Similar to male, but with maculation tending to be slightly more weakly represented on upper surface of wings, and much more weakly represented below; course of lines as in males (paratype) or situated nearer outer margins of wings (holotype); antennae simple.

LENGTH OF FOREWING: 20 mm. (holotype and paratype).

MALE GENITALIA: Uncus slender, elongate, 1.7 mm. in length; socius small; gnathos with very long, slender, and curving median extension; valve with costa swollen distally, with large membranous area medially at base on inner surface, with outer portion of valve having large area of thin setae distally, with slightly raised, rounded swelling about 0.5 mm. in length covered with numerous thick, shorter setae; anellus roughly W-shaped, with broad, shallow anterior indentation, and with elongate, tapering, finely punctate posterior median extension approximately twice as long as anellus; paired structures of anellus 1.3 mm. in length, with very long basal area, 0.8 to 1.0 mm. in length, then curving, with dentate apex bending dorsally; cristae very long; aedeagus 4.2 mm. in length, with posterior end slightly narrowed, lightly sclerotized, and having tapering tip; vesica, when exerted, slightly curving, with row of anteriorly directed spines, largest near tip of aedeagus, medially with one elongate, slender spine and about three shorter, stouter spines, and with semicircular band of very numerous, slender setae on opposite side of vesica. Abdomen with ventral row of setae on third segment, slightly reduced medially.

FEMALE GENITALIA: Sterigma with broad, sclerotized lamella antevaginalis, extending full width of segment anteriorly, narrowed posteriorly, with rounded caudal margins and shallowly V-shaped median indentation; ductus bursae very small, almost square in outline; ductus seminalis arising ventrally on right side; corpus bursae very large, posterior portion sclerotized and with longitudinal striations, then slightly narrowed and curving medially, weakly swollen anteriorly; signum large, 0.7 mm. in length, situated ventrally in minutely punctate area surrounded by concentric rings, purselike, with posterior opening, and with numerous short spinose projections on inner surface and around

margins; apophyses posteriores 2.1 mm. in length.

TYPES: Holotype, female, Las Hedionditas, on the road from Juntas to Embalsas La Laguna, Coquimbo Province, Chile, January 11, 1966 (L. E. Peña); allotype, male, Santiago, Chile. The genitalia of the holotype are mounted on slide F.H.R. No. 14538, and of the allotype, on No. 15813. Paratypes: El Manzano, elevation 1200 meters, Santiago Province, Chile, February 9, 1951 (L. E. Peña), one male; same data, elevation 2800 meters, February 10, 1951, one female.

The holotype is in the collection of the American Museum of Natural History; the allotype in that of the United States National Museum; and the paratypes are in the entomological collection of Cornell University.

DISTRIBUTION: Andes Mountains of Central Chile (the provinces of Coquimbo and Santiago).

TIME OF FLIGHT: January and February.

REMARKS: Four specimens (two males and two females) and four genitalic dissections have been studied.

#### ***Salpis antennata* Mabilie**

Figures 76, 83, 90, 91

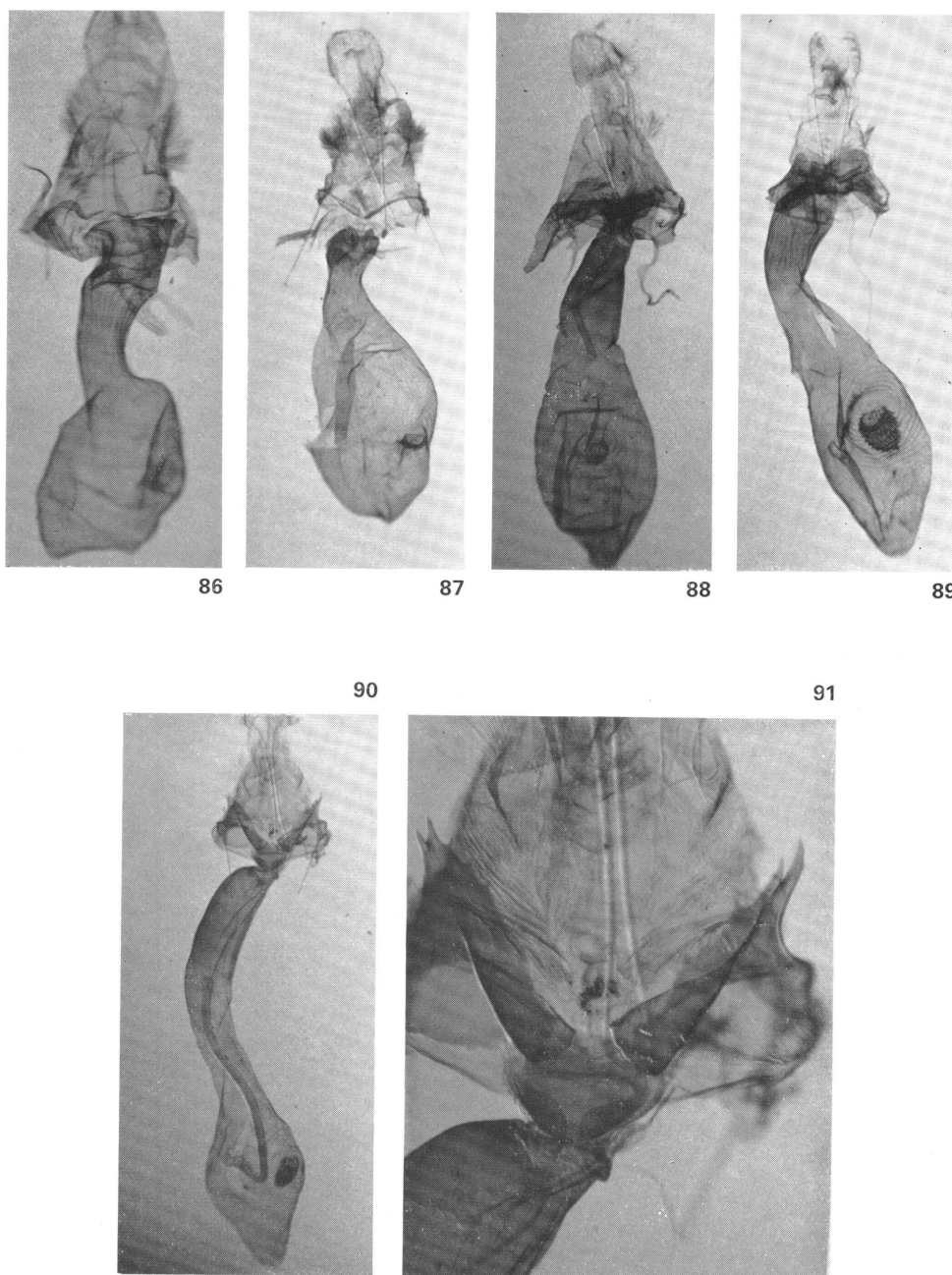
*Salpis antennata* MABILLE, 1885, p. 65; "1891" [1888], p. Div. 22, pl. 2, fig. 8 (male), pl. 3, fig. 1 (head). STAUDINGER, "1898" [1899], p. 81.

*Salpis (Salpis) antennata*: PROUT, 1910, p. 320.

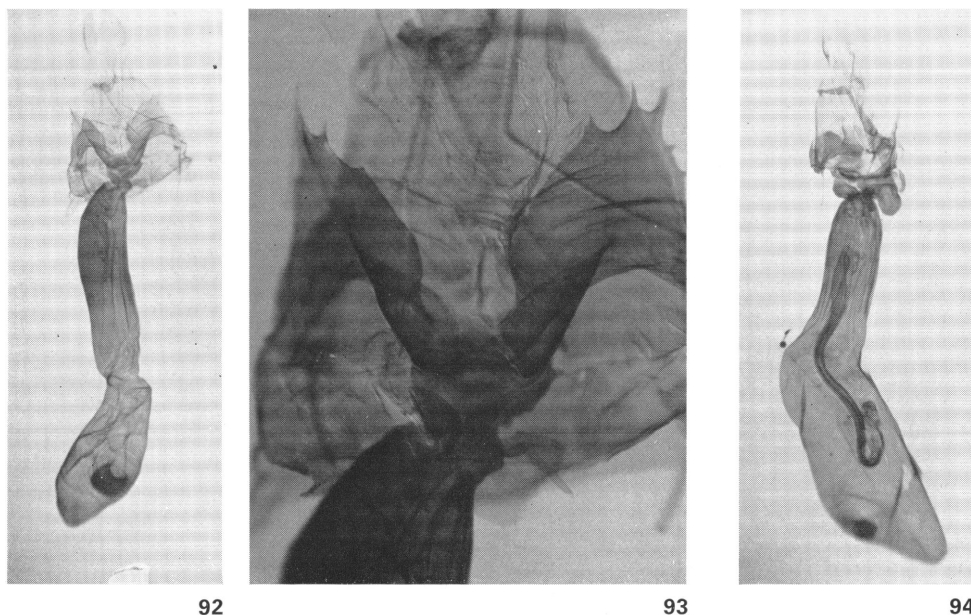
DIAGNOSIS: This species is similar to *glabra*, but the forewings are narrower and have a more pointed apex, the male has a hair pencil on the swollen hind tibia, and the genitalia of both sexes are distinctive.

MALE: Head with vertex grayish brown; front grayish brown, becoming pale gray ventrally; palpi with third segment very long, not quite reaching middle of eye, varying in color from pale gray or grayish brown, with dark brown scales, and with terminal segment covered with appressed grayish brown scales; antennae simple. Thorax grayish brown above, grayish white below; legs grayish white, with variable amount of brown and dark grayish brown scaling, and with swollen hind tibia having hair pencil. Abdomen grayish brown above, paler below, with scattered dark brown scales.

WINGS: Forewings elongate, with attenuate, pointed apex; outer margins of all wings weakly scalloped.



FIGS. 86-91. Female Genitalia. 86. *Salpis penai*, new species, allotype, El Manzano, Santiago Province, Chile, October 25-28, 1951 (L. E. Peña; C.U.). 87. *Salpis glabra*, new species, paratype, Los Cipreces, Talca Province, Chile, January 14, 1968 (L. E. Peña; A.M.N.H.). 88. *Salpis clarkei* Sperry, Graneros, O'Higgins Province, Chile, March 4, 1962 (L. E. Peña; A.M.N.H.). 89. *Salpis occulta*, new species, holotype, Los Hedionditas, Coquimbo Province, Chile, January 11, 1966 (L. E. Peña; A.M.N.H.). 90, 91. *Salpis antennata* Mabilie, San Martín de los Andes, Neuquén Province, Argentina, February 22, 1952 (S. Schajovskoy; A.M.N.H.). 90. Genitalia. 91. Sterigma and ductus bursae.



FIGS. 92-94. 92, 93. *Salpis aenea* (Butler), Valparaíso, [Chile] (B.M.). 92. Genitalia. 93. Sterigma and ductus bursae. 94. *Salpis tuberosa*, new species, allotype, Rinconada de Maipú, Santiago Province, Chile, November 10, 1958 (L. E. Peña; A.M.N.H.).

**UPPER SURFACE OF WINGS:** Forewings dark grayish brown, irrorate with brownish black scales; cross lines grayish black, similar in course to those of *glabra* but with t. p. line tending to be slightly more inwardly dentate on veins; discal spot large; terminal line slender or obsolescent; fringe concolorous with, or slightly paler than, wing. Hind wings concolorous with forewings, or with fewer brownish black scales; discal spot large; outer portion of wing similar to that of *glabra*.

**UNDER SURFACE OF WINGS:** Similar to that of *glabra*, but tending to have larger discal spots, particularly on hind wings (in *antennata*, 0.6 to 0.7 mm. long; in *glabra*, 0.4 to 0.5 mm. long), and thicker cross lines.

**LENGTH OF FOREWING:** 17 to 20 mm.

**FEMALE:** Similar to male; antennae simple.

**LENGTH OF FOREWING:** 18 to 22 mm.

**MALE GENITALIA:** Uncus slender, tapering, 1.5 to 1.7 mm. in length; socius small; gnathos slender, with tapering, narrow, pointed median area; valve with costa weakly swollen medially and distally, with large membranous area medially at base on inner face, with outer portion of valve having large area of dense setae distally, these partially obscuring group of thicker setae

arising from rather poorly defined tubercle 0.3 to 0.4 mm. in length; anellus roughly W-shaped, with narrow, median extension from posterior margin as long as, or longer than, remainder of anellus; paired structures of anellus 1.1 to 1.3 mm. in length, slender, straight except for curved, serrate apices; cristae very long; aedeagus 3.7 to 3.9 mm. in length, slightly curved, and with slender, pointed posterior end; vesica, when exerted, extending along axis of aedeagus, with ventral, single, slightly oblique row of approximately 14 spines, becoming thicker anteriorly, with one very long spine (up to 1.3 mm.), and one shorter, slender spine situated at posterior end of oblique row, and with dorsal incomplete band of numerous thin spines. Abdomen with ventral row of setae on third segment, reduced medially.

**FEMALE GENITALIA:** Sterigma with very large, subtriangular, sclerotized lamella antevaginalis, sharply narrowed medially, anterior portion U-shaped dorsoventrally and with pointed corners, becoming widest posterolaterally, with posterior margin having several separate small points; lamella postvaginalis weakly sclerotized, diffuse; ductus bursae short, subtriangular, sclerotized, slightly wider than long; ductus seminalis arising

as small sac from right posterior end ventrally of corpus bursae; latter very large, posterior portion rather weakly sclerotized, with a few longitudinal striations anteriorly, and with globular, membranous posterior portion; signum large, 0.5 to 0.7 mm. in length, situated ventrally or on right side, purselike, with posterior opening, and with numerous short spinose projections dorsally and around margins; apophyses posteriores 1.7 to 2.4 mm. in length.

TYPE: Mabilles described *antennata* from a single male; this specimen is in the collection of the Muséum National d'Histoire Naturelle, Paris.

TYPE LOCALITY: "Ex insulis Magellanicis," according to Mabilles's original description of *antennata*; in 1891, he gave the locality as "Oushouaia." The type locality is thus assumed to be Ushuaia, Isla Grande de Tierra del Fuego, Argentina.

DISTRIBUTION: Argentina. The species occurs from the Andean region (the provinces of Neuquén and Río Negro) to the southeastern coast (Chubut Province), and south to the Isla Grande de Tierra del Fuego.

TIME OF FLIGHT: December and February.

REMARKS: Twenty-five specimens (16 males and nine females) and nine genitalic dissections (five males and four females) have been studied.

Fletcher has examined the type specimen and its genitalia. I have studied the dissection that he used with the comparison with Mabilles's type.

#### **Salpis aenea** (Butler)

Figures 77, 84, 92

*Honorana aenea* BUTLER, 1882, p. 365.

*Salpis (Salpis) aenea*: PROUT, 1910, p. 320.

DIAGNOSIS: This large species looks like *glabra*, *occulta*, and *antennata*. From the first of these it may be distinguished by the presence of the tibial hair pencil of the male, from *occulta* by the genitalia, and from *antennata* by the broader, less pointed forewings.

MALE: Head similar to that of *antennata*, but tending to have grayish black scaling along sides of front and on palpi; antennae simple. Thorax and abdomen similar to those of *antennata*; hind tibia with prominent hair pencil.

WINGS: Forewings broad, apex pointed, and with gently rounded outer margin; outer margins of all wings weakly scalloped.

UPPER SURFACE OF WINGS: Forewings grayish brown, with scattered brownish black scales; cross lines grayish black, similar in course to

those of *antennata*; discal spot, terminal line, and fringe similar to those of *antennata*. Hind wings similar to those of *antennata*.

UNDER SURFACE OF WINGS: Grayish white, with grayish brown scaling on forewings; maculation similar to that of *glabra* but with cross lines tending to be broader.

LENGTH OF FOREWING: 21 to 23 mm.

FEMALE: Similar to male; antennae simple.

LENGTH OF FOREWING: 20 to 25 mm.

MALE GENITALIA: Similar to those of *antennata*, differing mainly as follows: uncus 1.5 to 1.8 mm. in length; gnathos tending to have slightly longer and thinner median, pointed area; valve with swollen tubercle about 0.5 to 0.6 mm. in length; anellus more definitely W-shaped, with longer and thinner median posterior extension, in length slightly longer than remainder of anellus; paired structures of anellus 1.3 to 1.4 mm. in length; aedeagus 3.8 to 4.3 mm. in length, with apical point tending to be slightly wider; vesica with oblique row of spines tending to be slightly more numerous and to be smaller in middle of row, and with very long spine 1.4 mm. in length. Abdomen with ventral row of setae on third segment, reduced or absent medially.

FEMALE GENITALIA: Similar to those of *antennata*, differing mainly as follows: sterigma with lamella antevaginalis tending to have each side more rectangular, with narrower median division, having in addition to anterior pointed corners a pair of rounded or weakly angulate lobes posteriad; lamella postvaginalis more or less sclerotized; ductus bursae triangular, with sides subequal in length; corpus bursae with area of sclerotization of posterior portion tending to be longer, extending almost to membranous anterior portion; apophyses posteriores 2.2 to 2.4 mm. in length.

TYPE: Butler had at least one specimen of each sex of *aenea*; the lectotype is hereby designated as the male with its genitalia on Geometridae slide No. 1951-453. This specimen is in the collection of the British Museum (Natural History).

TYPE LOCALITY: Las Zorras, a suburb of Valparaíso, Valparaíso Province, Chile.

DISTRIBUTION: Central Chile, occurring in both the coastal region (the province of Valparaíso) and in the Andes Mountains (the province of Santiago) at elevations up to at least 2400 meters.

TIME OF FLIGHT: November, December, January, and March.

REMARKS: Fourteen specimens (12 males and two females) and seven genitalic dissections (five males, including that of the lectotype, and two females) have been studied.

This species can easily be mistaken for either *glabra* or *occulta*, all of which occur in the same area of Chile. A careful study of the hind tibia of the male and the genitalia will probably be necessary to correctly determine the moths.

***Salpis tuberata*, new species**

Figures 78, 85, 94

DIAGNOSIS: This is a relatively small species with broad brown wings, having the subterminal area of the forewings paler than the remainder of the wings. The males have simple antennae and a hair pencil on the hind tibia. The genitalia are distinctive; see the key for details.

MALE: Head with vertex gray, tending to be grayish white between bases of antennae; front grayish brown, being brownish black laterally; palpi rising to middle of eye, with grayish white, brown, and brownish black scales, long-scaled ventrally, third segment very long, tending to be horizontal, and with small, tightly appressed scales; antennae simple. Thorax gray or grayish brown above, whitish gray below; legs grayish white with variable number of brown scales; hind tibia with prominent hair pencil. Abdomen grayish brown above, with scattered dark brown scales; paler below.

WINGS: Forewings broad, with relatively straight outer margin; outer margins of all wings scalloped.

UPPER SURFACE OF WINGS: Forewings grayish brown from base to t. p. line, being darker in outer portion of median area, and with subterminal area light brown; t. a. line arising on costa about one-third of distance from base, varying from obsolescent to weakly represented, gently outwardly curved crossing wing, tending to be slightly more heavily represented on veins; discal spot varying from obsolescent to prominent; median line absent; t. p. line complete, prominent, partially due to change of color on wing on both sides, arising on costa about four-fifths of distance from base, subparalleling outer margin to vein  $M_2$ , then outwardly bowed and swinging basad to vein  $Cu_2$ , thence convex to inner margin near outer angle; subterminal area

with some dark scaling near costa and above outer angle; terminal line varying from obsolescent to very slender, but having intravenular dots; fringe concolorous with, or slightly darker than, subterminal area. Hind wings slightly paler than forewings, especially basally; discal dot present, variable in strength; extradiscal line complete, tending to be rather slender anteriorly, and more or less basally indented on veins; subterminal area concolorous with remainder of wing; terminal line and fringe similar to those of forewings.

UNDER SURFACE OF WINGS: Forewings pale grayish white with faint brown tinge, and with grayish brown scaling anteriorly basad of cross line; hind wings pale grayish white, with scattered brownish black scales; discal spots black, those on hind wings larger and more prominent than those of forewing; outer cross lines broad, grayish black, prominent in most specimens; terminal line obsolescent; fringe concolorous with wings.

LENGTH OF FOREWING: 17 to 18 mm.; holotype, 17 mm.

FEMALE: Similar to male; antennae simple; upper surface of wings tending to have slightly more gray scaling than male.

LENGTH OF FOREWING: 18 mm. (allotype).

MALE GENITALIA: Uncus slender, tapering, elongate, 1.7 to 1.8 mm. in length; socius small; gnathos with elongate and very slender median area; valve with costa swollen distally, with large membranous area medially at base on inner surface, with outer portion of valve having large area of thin setae distally, with short, well-defined tubercle about 0.2 mm. in length having apical region completely covered with short, thick setae; anellus rectangular, with narrow anterior incision and with short posterior median extension being less than one-half as long as anellus; paired structures of anellus 1.1 to 1.2 mm. in length, becoming thicker and laterally compressed terminally, having curved, serrate apices; cristae very long; aedeagus 3.6 to 3.7 mm. in length, with posterior end having wide, slightly curved sclerotized tip; vesica, when exerted, extending at slight angle to aedeagus, with two large anterior spines, two thinner spines posteriorly, and incomplete band of numerous thin setae. Abdomen with ventral row of setae on third segment, reduced medially.

FEMALE GENITALIA: Sterigma with very large, sclerotized lamella antevaginalis, sharply



narrowed medially, becoming widest posterolaterally, with posterior margin having several, irregularly spaced small points, with dorsoventral flange along anterior portion of lamella; ductus bursae short, flanked laterally by two large protuberances, the latter extended dorsally and joining corpus bursae; ductus seminalis arising dorsally from near posterior end of corpus bursae; latter very large, angled medially, posterior portion sclerotized and with longitudinal striations, median and anterior portions membranous, latter bluntly pointed apically; signum large, 0.6 mm. in length, situated ventrally, purselike, with posterior opening, and with numerous spinose projections dorsally and around margins; apophyses posteriores 1.7 mm. in length.

**TYPES:** Holotype, male, near El Pangué, south of Vicuña City, Andes Mountains, elevation 900 meters, Coquimbo Province, Chile, November 23, 1961 (L. E. Peña); allotype, female, La Rinconada de Maipú, Santiago Province, Chile, November 10, 1958 (L. E. Peña). The genitalia of the holotype are mounted on slide F.H.R. No. 13120, and those of the allotype on No. 15557. Paratypes, both from Chile; same data as holotype, one male; same data as allotype, one male.

All the type specimens are in the collection of the American Museum of Natural History.

**DISTRIBUTION:** Central Chile, both in the Andes Mountains (Coquimbo Province) and in the central valley (Santiago Province).

**TIME OF FLIGHT:** November.

**REMARKS:** Four specimens (three males and one female) and three genitalic dissections (two males and one female) have been studied.

#### GENUS *PRAEANTARCTIA* HEIMLICH

*Praeantarcia* HEIMLICH, 1956, p. 310; 1960, p. 272.

**DIAGNOSIS:** This genus can be recognized by the male genitalia having the gnathos quadrate or extending as two sclerotized arms. The adults have the upper surface of the hind wings white or grayish white.

Head, front swollen or flat; palpi with third segment short or long; antennae of male shortly pectinate, each pectination angled distally at apex, and with pectinations extending to apex; antennae of female simple or weakly serrate. Thorax covered dorsally with either mixture of spatulate and hairlike scales or hairlike scales, extending as far as paired metathoracic tufts; hind tibia of male with hair pencil. Abdomen

with small dorsal tufts; ventral surface of third segment of male without row of setae. Wings elongate, with outer margins faintly dentate; forewing with areole; hind wing with Sc approximate to R to middle of cell.

The included species have the upper surface of the forewings either light gray, with black, parallel cross lines in both sexes, or either brownish white with a very large costal spot, or immaculate dull brown (males) or variably gray or brown with more or less irregular cross lines that may meet in the fold (females). The hind wings above are either white or grayish white, with little or no maculation.

**MALE GENITALIA:** Uncus elongate; socius small to moderate; gnathos quadrate or extending ventrally as two sclerotized arms; valves simple, with costa curved; anellus with well-sclerotized, terminally curved processes arising from broad bases; cristae absent; aedeagus with sclerotized posterior dorsal protuberance; vesica with variable number of spines of approximately equal length in single row, extending at right angle to aedeagus when exerted.

**FEMALE GENITALIA:** Ovipositor lobes with apophyses attached near middle of sclerotized anterior margin; sterigma in form of transverse plate; ductus bursae well defined, short to moderate in length; ductus seminalis arising ventrally; corpus bursae elongate; signum present.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

**TYPE SPECIES:** *Praeantarcia indecisa* Heimlich; by original designation.

#### KEY TO SPECIES<sup>1</sup>

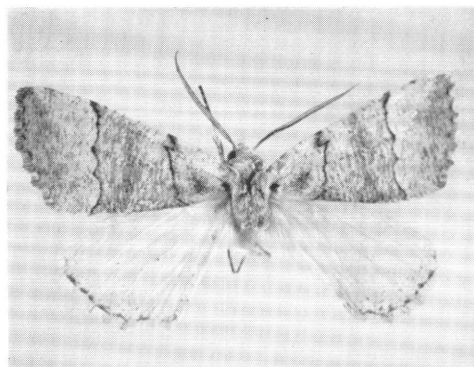
##### BASED ON MACULATION

1. Forewings gray, with two, black, parallel cross lines in both sexes . . . . . *albida*  
Forewings not as above . . . . . 2
2. Male with forewings unicolorous brown, in female variably gray or brown with irregular cross lines that usually meet in the fold . . . *indecisa*  
Male with forewings brownish white with large dark brown costal spot and usually with smaller spot on inner margin in center of wing, in female with darkened median area extending across wing . . . . . *decisa*

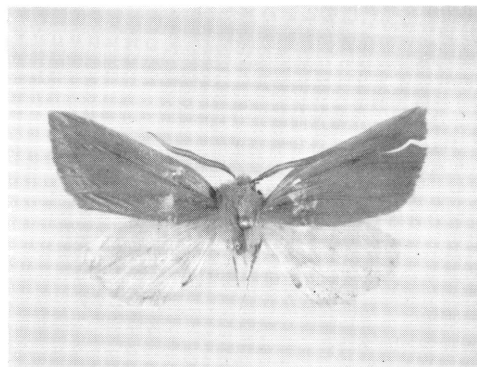
##### BASED ON MALE GENITALIA

1. Vesica a simple tube, with spines as long as width

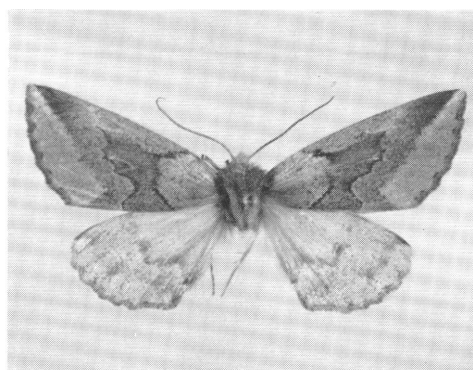
<sup>1</sup>No specimens of *decisa* have been examined.



95



96



97

FIGS. 95-97. Adults. 95. *Praeantarctia albida*, new species, holotype male, Aeropuerto Valdivia, Valdivia Province, Chile, February 2, 1967 (L. E. Peña; A.M.N.H.). 96. *Praeantarctia indecisa* Heimlich, male, Río Blanco, Malleco Province, Chile, January 27-February 5, 1959 (L. E. Peña; A.M.N.H.). 97. *Praeantarctia indecisa* Heimlich, female, Río Blanco, Malleco Province, Chile, February, 1964 (L. E. Peña; A.M.N.H.). All  $\times 1.5$ .

of exserted vesica . . . . . *albida*  
Vesica with terminal portion redoubled back  
towards aedeagus, and with spines about one-  
half to two-thirds as long as width of exserted  
vesica . . . . . *indecisa*

#### BASED ON FEMALE GENITALIA

1. Corpus bursae with tubular posterior one-half  
sclerotized and with longitudinal striations  
. . . . . *albida*  
Corpus bursae without tubular posterior portion,  
but with small, convoluted, sclerotized area  
. . . . . *indecisa*

#### ***Praeantarctia albida*, new species**

Figures 95, 98, 100

**DIAGNOSIS:** This species can be recognized by the upper surface of the forewings being grayish white, and in having more or less straight, parallel cross lines; the hind wings are white.

**MALE:** Head with vertex, front, and palpi white, front and palpi with variable number of dark gray and grayish black scales; palpi with

third segment short. Thorax above with mixture of spatulate and hairlike scales; these plus posterior tufts white with scattered dark gray scales; below white; legs white, with scattered dark gray scales, all tarsi grayish black, with posterior margins of segments white or grayish white. Abdomen above, and tufts gray, with variable number of grayish black and grayish brown scales, and with posterior margins of segments narrowly white; under surface white.

**UPPER SURFACE OF WINGS:** Forewings white or pale grayish white, evenly overlain with large number of gray and grayish black scales and transverse striations, these tending to be slightly more concentrated in broad median area and in terminal area; cross lines black, complete; basal area with group of black scales at base of cubital cell, and with nebulous gray patch in center of area; t. a. line arising on costa one-third of distance from base, proceeding to radial vein, sharply angled outward for about 1 mm., then

proceeding straight across wing to anal vein, thence curving basad to inner margin; median line represented by nebulous darker gray band paralleling t. p. line in outer portion of median area; t. p. line arising on costa two-thirds of distance from base, angled inward to radial vein, then proceeding across wing parallel with t. a. line, having small, outward bends on veins in center of wing and at inner margin; s. t. and terminal lines absent; fringe concolorous with wing. Hind wing white; without maculation except for some scattered gray scales along outer margin and, in some specimens, for faint trace of extradiscal line; dark gray terminal line usually present, interrupted by veins; fringe concolorous with wing.

UNDER SURFACE OF WINGS: White; forewings with dark gray scaling except in cubital cell, and with large, round, grayish black discal spot and curving t. p. line; hind wings with a few, scattered gray scales in outer part of wing, with small discal dot, a more or less complete, curving extradiscal line, beginning as large black spot on costa and then represented mainly on veins to anal margin, and an interrupted terminal line.

LENGTH OF FOREWING: 19 to 22 mm.; holotype, 22 mm.

FEMALE: Similar to male; antennae simple.

LENGTH OF FOREWING: 25 to 26 mm.; allotype, 25 mm.

MALE GENITALIA: Uncus very long and slender; gnathos quadrate, with small, raised, median lip; valves with sclerotized transverse strip near base; anellus with short (0.75 mm.), curved, slender sclerotized structures having wide bases 0.5 mm. in length; aedeagus 3.0 to 3.2 mm. in length; vesica a simple tube with single longitudinal row of from 18 to 24 spines.

FEMALE GENITALIA: Sterigma wide and narrow, extending laterally; ductus bursae lightly sclerotized, slightly longer than wide; ductus seminalis arising from ventral, posteriorly directed sac, and extending to left side; corpus bursae very long, 7 mm., posterior portion sclerotized and having numerous longitudinal striations, become membranous and globose anteriorly; signum 0.4 mm. in length, with swollen ventral surface and apparent postero-ventral opening, situated in ventral surface of corpus bursae.

TYPES: Holotype, male, and allotype, female, Aeropuerto Valdivia, near Valdivia, Valdivia Province, Chile, February 2, 1967 (L. E. Peña).

The genitalia of the holotype are on slide F.H.R. No. 15212, and of the allotype on No. 15571. Paratypes: *Chile*: Treguaelmu, on coast, west of Cauquenes, Maule Province, January 26, 1967 (L. E. Peña), one male; Cauquenes, [Maule Province], one male; same data as types, five males; Llancahue, south of Valdivia, Valdivia Province, January, 1964 (L. E. Peña), one male; Valdivia, 1904 (A. v. Lossberg), one female. *Argentina*: San Martín, Neuquén Province, January 18, 1958 (G. M. Gentili), one male.

The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of that institution and of the British Museum (Natural History).

DISTRIBUTION: Chile (the coastal mountains of Maule and Valdivia provinces) and Argentina (the Province of Neuquén).

TIME OF FLIGHT: January and February.

REMARKS: Twelve specimens (10 males and two females) and four genitalic dissections (three males and one female) have been studied.

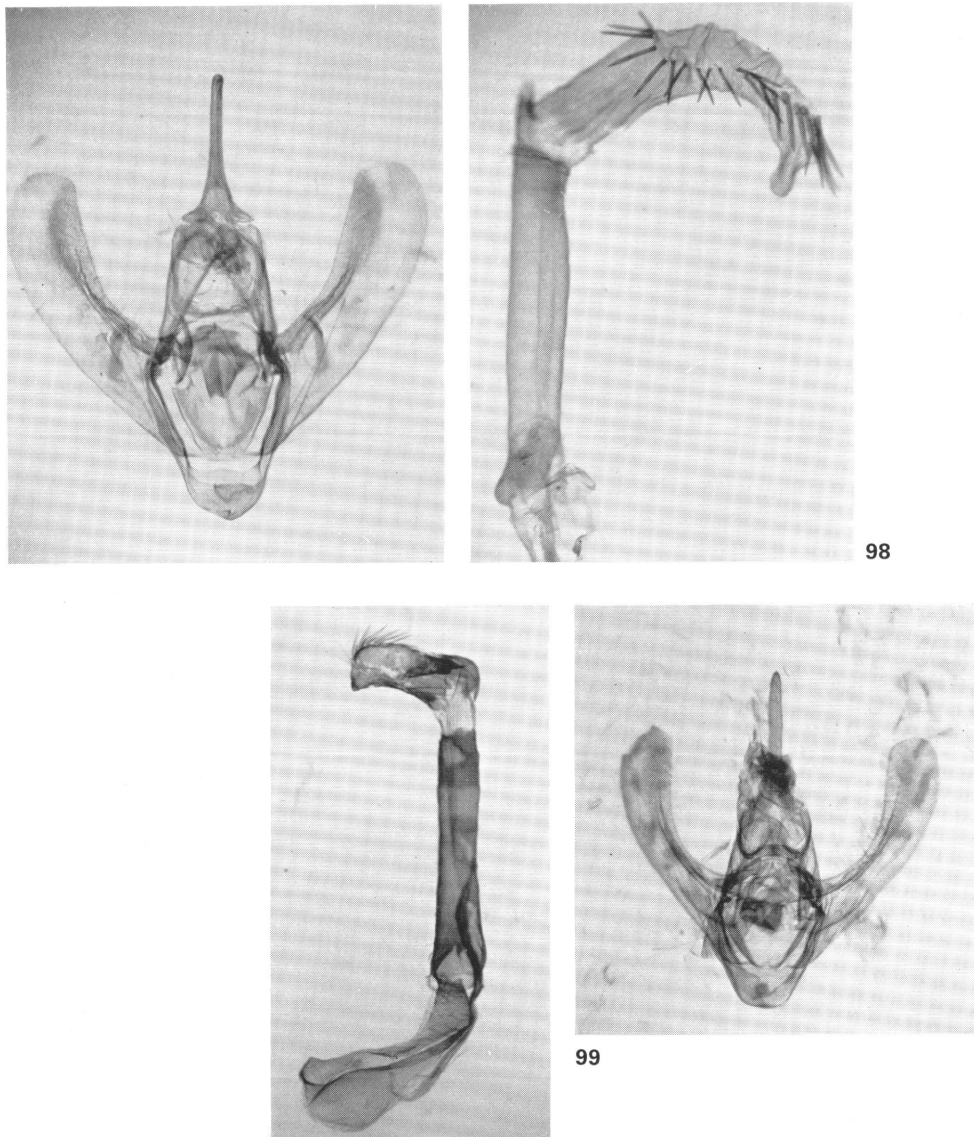
The single Argentinian male has slightly grayer forewings above than the Chilean males, and it has less maculation below.

#### ***Praeantarctia decisa* Heimlich**

*Praeantarctia decisa* HEIMLICH, 1960, p. 272, figs. 11 (male genitalia), 12–19 (adults).

No material of this species has been examined. According to the original description, the male has the upper surface of the forewings brownish white, with a large dark brown spot at the middle of the costa occupying about one-fourth of the length of the forewing extending posteriorly, becoming narrower, into the middle of the wing; there is usually a much smaller dark spot at the middle of the posterior margin. The upper surface of the forewings of the female has a continuous dark brown median band extending completely across the wing. The hind wings of both sexes have a more or less complete extradiscal band, tending to be more prominent in the female than in the male. The holotype female has a wing spread of 43 mm.; this specimen is stated by Heimlich to be in his private collection, as is the allotype male.

The types were taken near Osorno (presumably in this province, but this is not stated), Chile, in January. It is possible that Heimlich collected this species in other localities; the concluding portion of his article was apparently not



FIGS. 98, 99. Male Genitalia. 98. *Praeantartia albida*, new species, paratype, Tregualemu, Maule Province, Chile, January 26, 1967 (L. E. Peña; A.M.N.H.). 99. *Praeantartia indecisa* Heimlich, Río Blanco, Malleco Province, Chile, January 27–February 5, 1959 (L.E. Peña; A.M.N.H.).

published and so we do not know where his paratypes came from. Nothing is said about the genitalia of either sex in the original description. An extremely crude figure of the male genitalia is given in lateral view, but it is impossible to use this for any scientific descriptions or identifications.

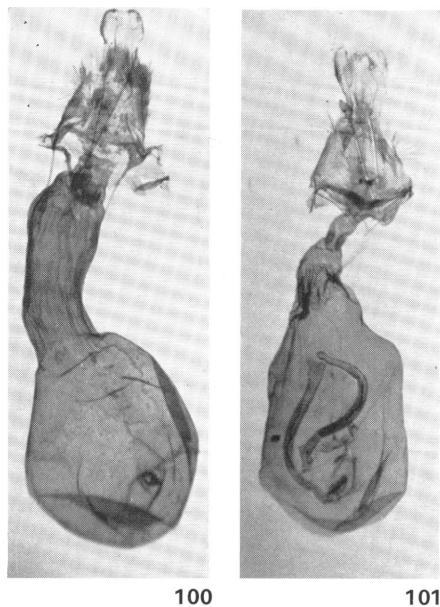
In maculation, *decisa* appears to be somewhat

intermediate between *albida* and *indecisa*. The present species has reduced maculation on the forewings, while retaining the complete median cross band similar to that of *albida*.

***Praeantartia indecisa* Heimlich**

Figures 96, 97, 99, 101

*Praeantartia indecisa* HEIMLICH, 1956, p. 309, pl. 14, figs. 1–4 (adults, male genitalia, venation).



FIGS. 100, 101. Female Genitalia. 100. *Praeantarctia albida*, new species, allotype, Aeropuerto Valdivia, Valdivia Province, Chile, February 2, 1967 (L. E. Peña; A.M.N.H.). 101. *Praeantarctia indecisa* Heimlich, Las Trancas, Ñuble Province, Chile, February 7–12, 1966 (L. E. Peña; A.M.N.H.).

**DIAGNOSIS:** This species is distinguished by the fact that the sexes are dimorphic in both the color and pattern on the upper surface of the forewings.

**MALE:** Head with vertex covered with elongate grayish white scales; front pale grayish brown; palpi grayish brown, with darker scaling laterally, and with elongate third segment. Thorax above with dull brown, elongate, hair-like scales, with some grayish hairlike scaling anteriorly; below pale grayish brown; legs pale grayish brown with numerous grayish black scales, and with posterior margins of tarsal segments narrowly grayish white. Abdomen above grayish brown, becoming paler posteriorly; under surface paler.

**UPPER SURFACE OF WINGS:** Forewings unicolorous tawny brown; without maculation except for nebulous discal spot and for short, paler diagonal line extending in from apex, with area antieradial tending to be slightly darker; fringe concolorous with wing. Hind wings white; without maculation except for poorly defined, sinuous intradiscal line reflected from under

surface, a very nebulous discal dot, and some yellowish scaling along outer margin; fringe concolorous with wing.

**UNDER SURFACE OF WINGS:** Forewings pale grayish brown, becoming whitish gray distally and along inner margin; without maculation. Hind wings yellowish white, with scattered brown scales and with faint yellowish brown scaling along veins; with dark brown, sinuous cross lines extending to discal dot or to anterior margin.

**LENGTH OF FOREWING:** 18 to 20 mm.

**FEMALE:** Head, thorax, and abdomen similar to those of male but tending to be dark gray; antennae weakly serrate.

**UPPER SURFACE OF WINGS:** Forewings variable in color, basal and outer areas usually paler than center of wing, varying from grayish white, grayish brown, to gray, with center of wing usually dark gray, and with brown area between cross lines in middle of wing; t. a. and t. p. lines black, narrow; t. a. line arising on costa one-fifth of distance from base, roughly W-shaped; t. p. line arising two-thirds to three-fourths length of costa, poorly represented in some specimens across costal margin, gently convex in middle of wing, enclosing brown area, concave below, varying from not meeting t. a. line, to forming point with it, to having two (upper and lower) loops, then outward to inner margin; outer portion of wing set off by straight line, varying in length, extending from apex to above inner margin; terminal line of black intravenular scaling present in some specimens. Hind wings whitish, with variable amount of brownish gray and grayish black scaling; maculation as in male but more strongly represented.

**UNDER SURFACE OF WINGS:** Similar to male but with more gray and grayish black scaling; forewings tending to have pale outer portion more sharply separated from remainder of wing than in male.

**LENGTH OF FOREWING:** 18 to 20 mm.

**MALE GENITALIA:** Uncus slender, slightly tapering; gnathos with large, laterally sclerotized median area; valve with concave costa, with elongate, low ridge near inner margin of costa, and with area of slender setae posteromedially on face of valve; anellus with anterior incision, lateral margins depressed and central area swollen ventrally, and with posterior margin bluntly pointed; paired structures of anellus 0.95 mm. in length, with very wide (0.5 mm.)

base, then sharply narrowed and angled posteriorly, ending in point; aedeagus 3.4 to 3.7 mm. in length, slightly curved; vesica extending at right angle to aedeagus, with outer tapered portion redoubled back to aedeagus, and having row of approximately 18 slender spines, distal ones being thicker than basal ones.

**FEMALE GENITALIA:** Sterigma lightly sclerotized laterally, and having sclerotized band tapering dorsally to apophyses anteriores; ductus bursae twice as long as wide, membranous but with short sclerotized area anteriorly; ductus seminalis arising ventrally from posterior margin of sclerotized band of corpus bursae; latter tear-shaped, membranous, with sclerotized, ridged area posteriorly, and with some longitudinal striations on left side medially; signum 0.4 mm. in length, situated dorsally, purselike, with posterior opening, and with some short spinose projections ventrally and around margins; apophyses posteriores 1.6 to 2.0 mm. in length.

**TYPE:** The holotype, male, is in the Zoologischer Staatssammlung, München, Germany.

**DISTRIBUTION:** Andes Mountains of central Chile (provinces of Ñuble and Malleco).

**TIME OF FLIGHT:** January and February.

**REMARKS:** Eight specimens (two males and six females) and five genitalic dissections (two males and three females) have been studied.

This species is unique, insofar as I know, in the Nacophorini in having the marked sexual dimorphism in both the color and pattern of the upper surface of the forewings.

The two males show very little variation in color and pattern, except that one is more rubbed and had obviously been flying for a longer period of time than had the other. On the other hand, the females are extremely variable in both color and pattern, with each specimen being noticeably different from all the others.

Heimlich first described this species as a member of the Notodontidae; in his later paper (1960) he correctly placed it as a geometrid.

My identification is based on a study of the photograph of the adults (figs. 1, 2) given by Heimlich. Unfortunately, the lateral view of the male genitalia (fig. 3) is of no help in identifying the species.

#### GENUS *CATOPHOENISSA* WARREN

*Catophoenissa* WARREN, 1894, p. 464.

**DIAGNOSIS:** This genus can be recognized by

the short third segment of the palpi, and by the orange or reddish orange coloration of the upper surface of the hind wings.

Head, front swollen; palpi with third segment short; antennae of male shortly pectinate, each pectination angled distally at apex, and with terminal six to nine segments simple; antennae of female simple. Thorax covered dorsally with mixture of spatulate and hairlike scales; patagia moderately long, extending as far as paired metathoracic tufts; hind tibia of male with or without hair pencil. Abdomen with dorsal tufts; ventral surface of third segment of male without row of setae. Wings broadly triangular, with outer margin of forewing weakly dentate, of hind wing more strongly dentate; forewing with or without areole; hind wing with Sc approximate to R near base or to beyond middle of cell.

The species have the upper surface of the forewings brown or dark gray, with the t. a. and t. p. lines being present in most specimens. The hind wings are orange or reddish orange above, with a black post discal cross line and a variable amount of dark gray or black scaling along the outer and anal margins. The under surface of the wings is pale, with the outer cross line being represented on both wings; a variable portion of the forewings is orange.

**MALE GENITALIA:** Uncus elongate, bearing numerous setae on dorsal surface; socius moderate; gnathos V-shaped, with median area weakly or strongly extended; valves simple, with costa curved; anellus with slender, elongate, rodlike sclerotized structures; cristae absent; vesica either unarmed or with single large spine and several slender spines, extending at right angle to aedeagus when exerted.

**FEMALE GENITALIA:** Ovipositor lobes with apophyses attached near middle of more or less sclerotized anterior margin; sterigma in form of transverse plate; ductus bursae short and well defined; ductus seminalis arising ventrally; corpus bursae moderate to elongate; signum present.

**EARLY STAGES:** Unknown.

**FOOD PLANT:** Unknown.

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

The generic status of *Catophaenissa* (sic!) *jonesaria* Schaus (1929, p. 50, pl. 3, fig. 7) remains to be determined. One female has been studied; this is the only specimen other than the female

type (U.S.N.M. No. 33542) in the collection of the United States National Museum known to me. This species differs in a number of ways from the other two members of the genus, and a study of the male is needed before *jonesaria* can be properly placed. Some of these points of difference are as follows: the present species has a very strongly angled and elongate  $m+1dc$  cross vein in the hind wings; it has a very large, pyramidal frontal protuberance that is not represented in any other known Nacophorini; and the upper surface of the hind wings is black, with a white, more or less checkered fringe (fig. 106). In addition, its distribution would throw considerable doubt as to its placement in this section of the Nacophorini; *jonesaria* is known only from Santa Catarina in southern Brazil, whereas all other members are from the Andean region. The abdomen of the specimen studied was partially smashed, and only a portion of the genitalia was salvaged; the corpus bursae is elongate, membranous, has a narrow posterior portion and a swollen anterior part containing a rather large signum 0.8 mm. in length. The signum has the posterior half tapering to a point, and the anterior margin is rounded, with a raised, outwardly dentate rim (fig. 112).

### KEY TO SPECIES

#### BASED ON MACULATION AND DISTRIBUTION

1. Forewings with t. p. line extending outward to and forming prominent projection on vein  $M_2$ ; subterminal area grayish white, not clearly differentiated; male with hair pencil on hind tibia . . . . . 2  
Forewings with t. p. line extending slightly inward to vein  $M_3$ , without tooth on  $M_2$ ; subterminal area broadly ochraceous, clearly differentiated; male without hair pencil on hind tibia . . . . . *fuenzalidai*
2. Larger, with length of forewing of male from 21 to 23 mm., and of female 22 to 25 mm.; hind wings with anal margin narrowly grayish brown, at most occupying cell  $Cu_2$ ; colors bright and contrasting; Chile . . . *dibapha dibapha*  
Smaller, with length of forewing of male from 19 to 21 mm., and of female 23 mm.; hind wings with anal margin broadly grayish brown, usually occupying part of discal cell and base of cell  $Cu_1$  in addition to Cell  $Cu_2$ ; colors dull; Argentina . . . . . *dibapha vesca*

#### BASED ON MALE GENITALIA

1. Vesica unarmed . . . . . *fuenzalidai*  
Vesica with prominent spines . . . . . *dibapha*

#### BASED ON FEMALE GENITALIA

1. Corpus bursae with posterior end sclerotized, with numerous longitudinal striations; corpus bursae very long, 6 to 7 mm. . . . . *dibapha*  
Corpus bursae membranous, without posterior striations; corpus bursae short, 2.9 to 3.6 mm. . . . . *fuenzalidai*

**Catophoenissa dibapha** (C. Felder, R. Felder, and Rogenhofer)

*Epimecis dibapha* C. FELDER, R. FELDER, AND ROGENHOFER, 1874 (1864-1875), pl. 125, figs. 10, 10a.

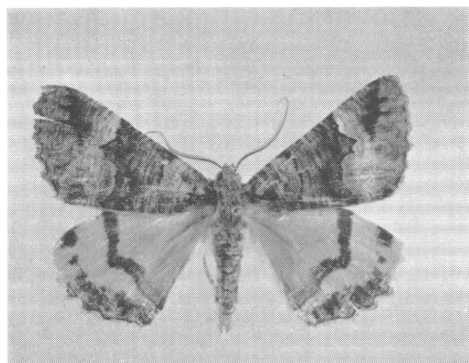
**DIAGNOSIS:** This large and beautiful moth can be recognized by the brown or grayish brown upper surface of the forewings, with the t. p. line outwardly toothed on vein  $M_2$ .

**MALE:** Head with vertex, front, and palpi grayish brown. Thorax above and posterior tufts grayish brown or brownish gray, with some broad, terminally truncate whitish gray scales; ventrally whitish, pale ochraceous or light gray; legs ochraceous with dark brown scaling; hind tibia with hair pencil. Abdomen above and tufts varying from pale gray to brownish gray, with scattered dark gray and dark brown scales, and with posterior margins of segments narrowly black; under surface paler.

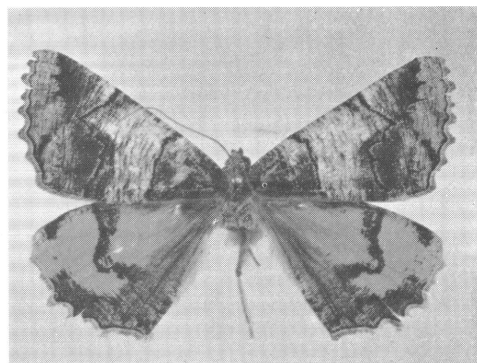
**VENATION:** Forewings with areole; veins  $mdc$  and  $ldc$  tending to be inwardly oblique and concave; hind wings with  $Sc$  approximate to  $R$  near base only.

**UPPER SURFACE OF WINGS:** Forewings gray or brown, with many dark gray and dark brown transverse striations, one scale wide, and with median area tending to be darker than adjacent areas; cross lines black, narrow, complete; basal line obsolescent; basal area with black scaling on cubital vein; t. a. line arising on costa one-fourth of distance from base, evenly curving outward and posteriorly to cubital cell or anal vein, then gently curved basad, angled outward and then sharply inward to meet inner margin; median line weakly represented in most specimens in lower portion of wing, situated nearer to t. p. line than to t. a.; t. p. line arising on costa shortly beyond middle of wing, extending at right angle, then curving outward to form prominent tooth on vein  $M_2$ , thence broadly concave to anal vein with small outward teeth on veins, extending to inner margin with small concave bend; subterminal area broad, nebulous, grayish white, more or less heavily overlain with dark striations, and with large concavity of

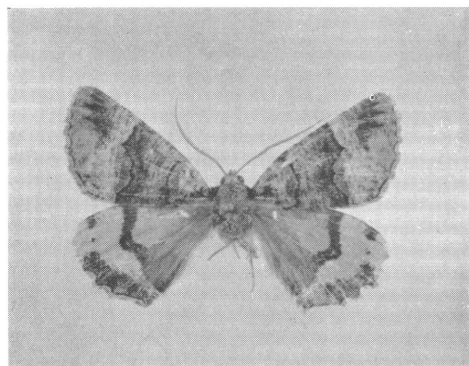




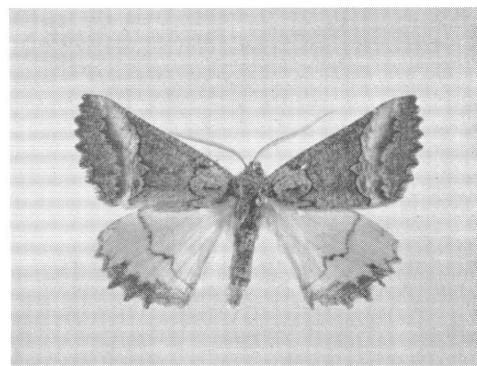
102



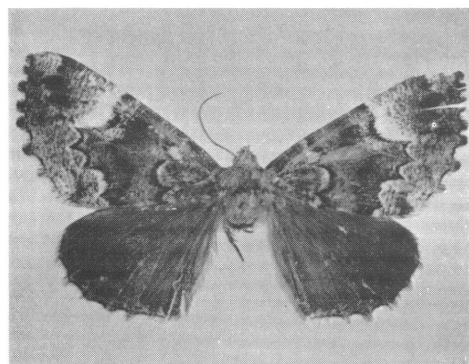
103



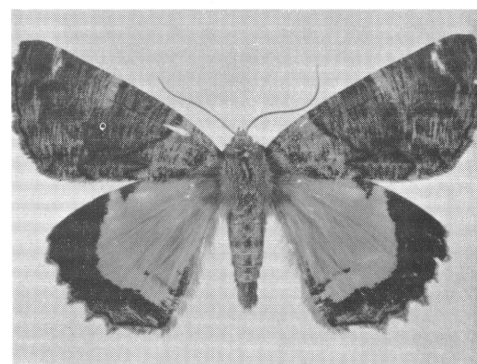
104



105



106



107

FIGS. 102–107. Adults. 102. *Catophoenissa dibapha dibapha* (C. Felder, R. Felder, and Rogenhofer), male, Los Maquis, Coquimbo Province, Chile, March 11–12, 1964 (L. E. Peña; A.M.N.H.). 103. *Catophoenissa dibapha dibapha* (C. Felder, R. Felder, and Rogenhofer), female, Pucatrihue, Osorno Province, Chile, January 23–31, 1966 (L. E. Peña; A.M.N.H.). 104. *Catophoenissa dibapha vesca*, new subspecies, holotype male, El Bolson, Río Negro Province, Argentina, January 2, 1961 (A. Kovacs; A.M.N.H.). 105. *Catophoenissa fuenzalidai* Ureta, male, Río Teno, Curicó Province, Chile, March 7–8, 1962 (L. E. Peña; A.M.N.H.). 106. *Catophoenissa* (?) *jonesaria* Schaus, female, Santa Catarina, Brazil, March 24, 1922 (E. D. Jones; U.S.N.M.). 107. *Catocalopsis medinae* (Bartlett-Calvert), male, Pichinahuel, Arauco Province, Chile, February, 1963 (L. E. Peña; A.M.N.H.). All  $\times 1.2$ .

t. p. line filled with gray or grayish black scales;  
s. t. line represented by longitudinal rows of  
black or brownish black scaling in cells  $R_5$  and  
 $M_1$ , and with variable amount of brown and

brownish black scaling extending from costa to  
about vein  $M_2$ , in some specimens weakly indi-  
cated for length of wing, with strengthening of  
dark scaling at outer angle; terminal line grayish

black, ranging from complete to partially represented; fringe pale at base, then concolorous with wing. Hind wings orange-red; extradiscal cross line black, prominent, complete, with strong outward bend on vein  $M_3$ ; outer margin with broad grayish black scaling posteriorly, changing to spots anteriorly; anal margin grayish brown; terminal line present along posterior dark band, absent anteriorly; fringe concolorous with wing.

**UNDER SURFACE OF WINGS:** Forewings orange or reddish orange, with broad black t. p. line, with grayish black apical area becoming paler near outer margin, and with dark gray band along inner margin. Hind wings whitish or pale ochraceous, variably overlain with dark gray and dark brown scales; discal dot present in most specimens; extradiscal line strongly represented, with course as on upper side; subterminal area broadly pale along extradiscal line, becoming more heavily overlain with dark scales in terminal area.

**LENGTH OF FOREWING:** 19 to 23 mm.

**FEMALE:** Similar to male, but tending to have median area of forewings above broader and, in some specimens, to have all or most of median area suffused with white scales.

**LENGTH OF FOREWING:** 22 to 25 mm.

**MALE GENITALIA:** Very large, 4.5 to 5.6 mm.; uncus with apical portion slightly wider than median area; gnathos V-shaped, with slender, elongate, curved median projection; anellus with rodlike structures 1.6 to 1.9 mm. in length; aedeagus shorter than combined lengths of uncus, saccus, and tegumen, having posterior end sclerotized and with one or two short, raised ridges on ventral surface; vesica, when exerted, extending at right angle to aedeagus and usually bearing (perhaps deciduous?) several long, slender spines, and with very long spine parallel with aedeagus.

**FEMALE GENITALIA:** Sterigma poorly defined, having elongate sclerotized extensions from posterolateral margins of ductus bursae; ductus bursae well sclerotized, slightly tapering anteriorly and then weakly swollen, with length more than twice width; ductus seminalis extending to right side; corpus bursae very long, 6 to 7 mm., posterior portion sclerotized and having numerous longitudinal striations, becoming membranous and evenly enlarged anteriorly; signum 0.4 to 0.5 mm. in length, with swollen ventral surface and apparent posterior opening, located on

ventral surface of corpus bursae.

This species is divided into two named populations.

**Catophoenissa dibapha dibapha**  
(C. Felder, R. Felder, and Rogenhofer)

Figures 102, 103, 108

*Epimecis dibapha* C. FELDER, R. FELDER, AND ROGENHOFFER, 1874 (1864-1875), pl. 125, figs. 10 (upper surface), 10a (under surface).

*Catophoenissa dibapha*: WARREN, 1894, p. 464.

*Catophoenissa dibapha albicentra* URETA, 1956, p. 271, fig. 5 (male genitalia), pl. 1, figs. 1a (male), 1b (female). New synonymy.

**DIAGNOSIS:** The moths of the population that occur in Chile are large in size and are brightly colored.

**MALE: UPPER SURFACE OF WINGS:** Forewings gray or brown, with numerous striations; median area grayish brown or dark brown, usually contrasting with adjacent areas of wing; s. t. line below costa well defined, sharply differentiated. Hind wings with anal margin varying from having very few grayish brown scales (specimens from northern portion of range) to having cell  $Cu_2$  grayish brown (more southerly examples).

**LENGTH OF FOREWING:** 21 to 23 mm.

**FEMALE:** Similar to male, some examples tending to have more unicolorous forewings above, other specimens with all or most of median area suffused with white scales.

**LENGTH OF FOREWING:** 22 to 25 mm.

**MALE GENITALIA:** As described for the species.

**FEMALE GENITALIA:** As described for the species.

**TYPES:** Of *dibapha*, the unique male is in the collection of the British Museum (Natural History); its genitalia were mounted by me on Geometridae slide No. 7504.

Of *albicentra*, the holotype male is No. 5939 in the collection of the Museo Nacional de Historia Natural, Santiago, Chile.

**TYPE LOCALITIES:** Chile (*dibapha*); Pemehue, Bio-Bio Province, Chile, elevation 800 meters (*albicentra*).

**DISTRIBUTION:** Central and southern Chile, from Coquimbo Province to Chiloé Province. Most of the specimens examined have been from the coastal mountains (provinces of Coquimbo, Aconcagua, Valparaíso, Santiago (also in the central valley), Maule, Cautín, Valdivia, Osorno, and Chiloé); the species is also known to

occur in the Andes (provinces of Malleco and Bio-Bio).

TIME OF FLIGHT: January, February, March, and April.

REMARKS: Thirty-four specimens (25 males and nine females) and six genitalic dissections (four males and two females), including the genitalia of the type of *dibapha*, have been studied.

Ureta's type series included specimens from both the Andes and the coastal mountains. It appears that he based his name on the white dimorphic color form of the female, although he had both sexes before him when he described *albicentra*.

***Catophoenissa dibapha vesca*, new subspecies**  
Figures 104, 110

DIAGNOSIS: The moths that occur in Argentina are smaller in size and duller in color than are those of the nominate population.

MALE: UPPER SURFACE OF WINGS: Forewings gray or dull brown, with relatively few striations; median area brownish gray, not appearing sharply contrasting with adjacent areas of wing; s. t. line below costa varying from weakly to moderately well defined, usually not sharply differentiated. Hind wings with anal margin broadly grayish brown, occupying part of discal cell, base of cell Cu<sub>1</sub>, and all of cell Cu<sub>2</sub>.

LENGTH OF FOREWING: 19 to 21 mm.; holotype, 20 mm.

FEMALE: Similar to male, with some white scaling in median area.

LENGTH OF FOREWING: 23 mm. (allotype).

MALE GENITALIA: As described for the species.

FEMALE GENITALIA: As described for the species.

TYPES: Holotype, male, El Bolson, Río Negro Province, Argentina, January 2, 1961 (A. Kovacs); allotype, female, same data but only 1961 for date. The genitalia of the holotype are mounted on slide F.H.R. No. 15736 and of the allotype on No. 15756. Paratypes, all from Argentina: Bariloche, Neuquén Province, February 5, 25, 1952, eight males; San Carlos de Bariloche, Neuquén Province, January, 1951 (J. Foerster), one male; "Neuquén, N. Patagonia," February 4, 1952 (S. Schajovskoy), one male.

All the above type material is in the collection of the American Museum of Natural History.

DISTRIBUTION: The eastern side of the Andes

Mountains in the Argentinian provinces of Neuquén and Río Negro.

TIME OF FLIGHT: January and February.

REMARKS: Twelve specimens (11 males and one female) and five genitalic dissections (four males and one female) have been studied.

The upper surface of the hind wings and lower surface of the primaries vary from orange to reddish orange in all specimens examined except one. The male from San Carlos de Bariloche has these areas yellowish orange. In other respects of color and pattern, this moth agrees very well with the other specimens.

***Catophoenissa fuezalidai* Ureta**  
Figures 105, 109, 111

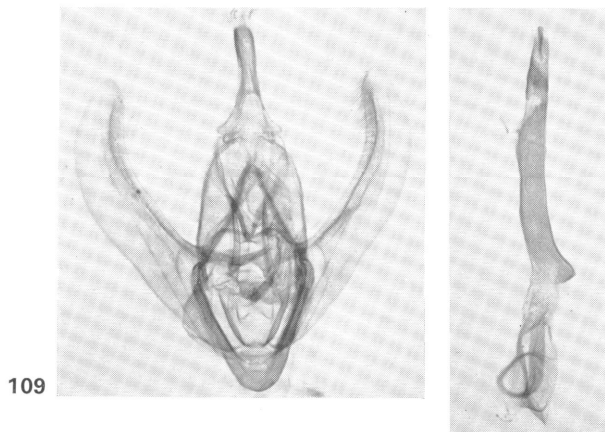
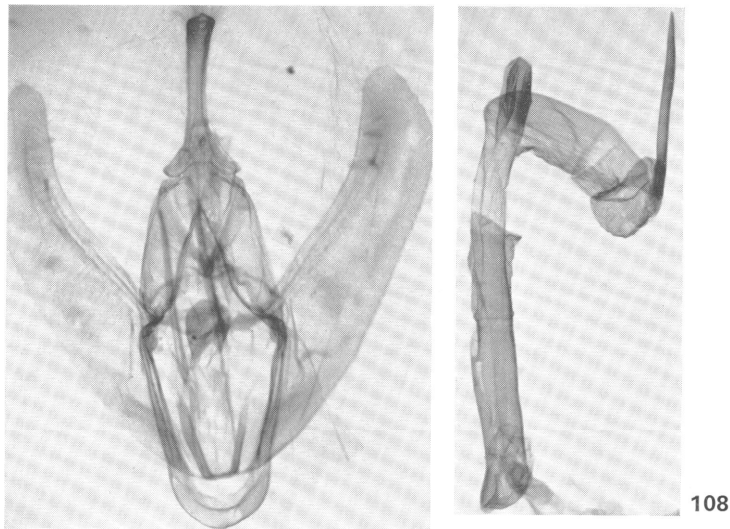
*Catophoenissa fuezalidai* URETA, 1956, p. 273, fig. 4 (male genitalia), pl. 1, figs. 2a (male), 2b (female).

DIAGNOSIS: This species is smaller than *dibapha*; the upper surface of the forewings is dark gray, with a clearly differentiated, ochraceous subterminal area.

MALE: Head, with vertex, front, and paipi grayish brown; area between bases of antennae with very broad, pale gray scales. Thorax above and posterior tufts grayish brown, with some broad, terminally truncate pale gray scales; collar and patagia with variable number of hair-like ochraceous brown scales; ventrally whitish; legs whitish gray with brownish gray and dark brown scaling; hind tibia without hair pencil. Abdomen above and tufts grayish brown, with posterior margins of segments narrowly white; under surface paler.

VENATION: Forewings without areole; veins mdc and ldc straight, at right angle to costa; hind wings with Sc approximate to R to beyond middle of cell.

UPPER SURFACE OF WINGS: Forewings dark gray, with scattered black scales; cross lines black, narrow, complete; basal area broadly ochraceous, more or less heavily overlain with dark brown scales; t. a. line arising on costa one-fifth of distance from base, strongly outcurved, with small basal bend on cubital vein and with strong inward tooth on anal vein; median area with brown or ochraceous brown scaling along cubital and anal veins; median line absent; discal dash present in many specimens; t. p. line arising on costa about three-fourths of distance from base, curving obliquely inward to about vein M<sub>3</sub>, then angled basally in cell Cu<sub>1</sub>, thence outwardly oblique with outward projections on veins Cu<sub>2</sub>

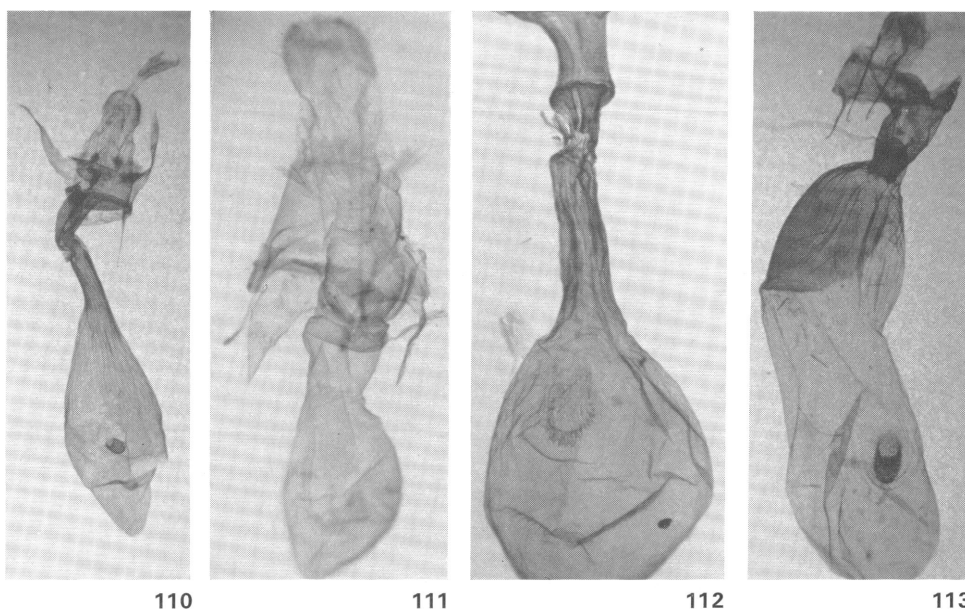


FIGS. 108, 109. Male Genitalia. 108. *Catophoenissa dibapha dibapha* (C. Felder, R. Felder, and Rogenhofer), Dalcahue, Chiloé Province, Chile, January 17–31, 1962 (L. E. Peña; A.M.N.H.). 109. *Catophoenissa fuenzalidai* Ureta, Río Teno, Curicó Province, Chile, March 7, 1962 (L. E. Peña; A.M.N.H.).

and A, then angled basally to inner margin; subterminal area broad, sharply defined, extending length of wing, ochraceous, with dark brown shading posteriorly; s. t. line pale gray or ochraceous, extending along outer margin of subterminal area; terminal area concolorous with median area, with veins tending to be ochraceous or brown; terminal line black, narrow, more or less interrupted by veins; fringe concolorous with terminal area of wing. Hind wings ranging in color from yellowish orange to reddish orange; extradiscal line present in most specimens, black, bent outward in cell  $M_1$  and

angled inwardly in cell  $Cu_1$ ; outer margin with variable amount of grayish black scaling posteriorly; anal margin tending to be somewhat paler than remainder of wing; terminal line incomplete; fringe grayish black, but paler anteriorly in some specimens.

**UNDER SURFACE OF WINGS:** Forewings pale gray, with middle of wing orange or yellowish; costa narrowly dark gray, with apical portion of wing and outer margin broadly dark gray; t. p. line grayish black, extending across wing, with basal bend in cell  $Cu_1$ ; small discal dash present in many specimens. Hind wings white, with



FIGS. 110–113. Female Genitalia. 110. *Catophoenissa dibapha vesca*, new subspecies, allotype, El Bolson, Río Negro Province, Argentina, 1961 (A. Kovacs; A.M.N.H.). 111. *Catophoenissa fuenzalidai* Ureta, Río Teno, Curicó Province, Chile, March 7–8, 1962 (L. E. Peña; A.M.N.H.). 112. *Catophoenissa* (?) *jonesaria* Schaus, Santa Catarina, Brazil, March 24, 1922 (E. D. Jones; U.S.N.M.). 113. *Catocalopsis medinae* (Bartlett-Calvert), El Bolson, Río Negro Province, Argentina, March 1, 1961 (A. Kovacs; A.M.N.H.).

scattered grayish black scales; without maculation except for weak trace of extradiscal line, in some specimens, and for grayish black terminal line.

LENGTH OF FOREWING: 19 to 21 mm.

FEMALE: Similar to male, but tending to have more brown scaling in basal and subterminal areas of forewings above; under surface of hind wings with more grayish black scales.

LENGTH OF FOREWING: 22 to 24 mm.

MALE GENITALIA: Smaller than those of *dibapha*, being 3.8 to 4.0 mm. in length; uncus of even width terminally; gnathos V-shaped, with small, ventrally projecting median enlargement; anellus with rodlike structures 0.9 to 1.0 mm. in length; aedeagus equal to combined lengths of tegumen and saccus, and with posterior end sclerotized; vesica unarmed.

FEMALE GENITALIA: Sterigma with wide lamella antevaginalis; ductus bursae well sclerotized, square, with parallel sides; ductus seminalis extending to right side; corpus bursae 2.9 to 3.6 mm. in length, membranous, anterior portion somewhat swollen; signum inconspicuous or obsolescent, at most 0.2 mm. in length,

located on right side of corpus bursae.

TYPE: The holotype, male, is No. 5927 in the collection of the Museo Nacional de Historia Natural, Santiago, Chile.

TYPE LOCALITY: La Obra, Valle del Maipo, Santiago Province, Chile.

DISTRIBUTION: Central Chile. The species is known from the coastal mountains of Coquimbo, Aconcagua, Valparaíso, Santiago, Colchagua, and Ñuble provinces, and from the Andes in Santiago and Curicó provinces.

TIME OF FLIGHT: February, March, April, and early May.

REMARKS: Thirty specimens (27 males and three females) and four genitalic dissections (two males and two females) have been studied.

There is some variation in the amount of ochraceous scaling on the veins in the terminal area of the upper surface of the forewings. The five males from coastal Coquimbo Province have this strongly represented; in addition, the forewings are a paler gray than are those from the other areas. The two males from coastal Aconcagua Province have strongly ochraceous veining in the terminal area, and the forewings are a

deep gray. The remaining specimens tend to have relatively little pale scaling in the terminal area, and their primaries are also deep gray.

One of Ureta's paratypes was collected as a caterpillar in September, 1894, with the moth emerging in March, 1895.

#### CATOCALOPSIS, NEW GENUS

DIAGNOSIS: This genus can be recognized by the palpi having the last segment very long and slender, and by the upper surface of the hind wings being bright red with a black border.

Head, front flat; palpi with third segment very long and slender, subequal in length to length of eye; antennae of both sexes simple. Thorax covered dorsally with mixture of spatulate and hairlike scales; patagia moderately long, extending as far as paired metathoracic tufts; hind tibia of male with hair pencil. Abdomen with dorsal tufts; ventral surface of third segment of male without row of setae. Wings broadly triangular; outer margin of forewings weakly dentate, of hind wings strongly toothed; forewing without areole, and with narrow cell due to anterior position of cubital vein; hind wing with Sc approximate to R near base.

The upper surface of the forewings is a dark grayish brown, with the outwardly oblique t. a. and t. p. lines present in many specimens. The hind wings above are bright red with a broad black border. The under surface of the wings is mostly bright red and orange-red, with black borders to the wings and a prominent black t. p. line on the forewings.

MALE GENITALIA: Uncus large, strongly trifid; socius moderate; gnathos V-shaped, with sclerotized and somewhat swollen median area; valves simple, weakly curved, with costa slightly projecting apically; anellus with very long, slender, sclerotized structures having broad bases; vesica expanding transversely on both sides of aedeagus, with many slender, elongate spines from one arm thereof.

FEMALE GENITALIA: Ovipositor lobes with apophyses attached near middle of membranous anterior margin; sterigma weakly sclerotized, with lateral band on each side; ductus bursae sclerotized, well defined, terminating posteriorly in two large lobes; ductus seminalis arising ventrally and slightly on right side, extending posteriorly as sac before becoming thin tube; corpus bursae very large, extending almost full length of abdomen, with heavily sclerotized area

posteriorly on left side; signum large, elongate.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE SPECIES: *Epimecis* ? *medinae* Bartlett-Calvert.

The maculation of the adults is basically similar to that of the species of *Catophoenissa*, particularly as members of both genera have red or orange-red hind wings. Structurally the two genera are quite distinct, as the present genus has simple male antennae, the very long third segment of the palpi, a flat front, and distinctive genitalia.

ETYMOLOGY: *Catocalopsis* is an unpublished name of Warren, who recognized the distinctness of *medinae*. Because the adults of *medinae* look similar to those of the genus *Catocala* Schrank, the suffix *-opsis* was added to that generic name. The gender is feminine.

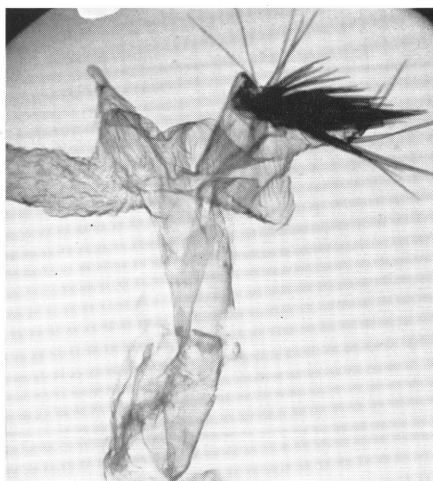
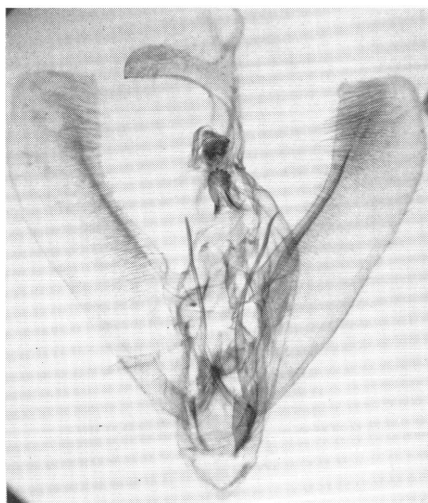
**Catocalopsis medinae** (Bartlett-Calvert),  
new combination  
Figures 107, 113, 114

*Epimecis* ? *medinae* BARTLETT-CALVERT, 1891, p. 314.

DIAGNOSIS: This species can be recognized by the generic characters.

MALE: Head with vertex light gray; front brownish gray or light gray; palpi with first segment pale ochraceous brown, second segment grayish brown, elongate third segment gray and with closely appressed scales. Thorax above and posterior tufts with mixture of whitish gray, dark gray, brown, and orange brown scales; ventrally covered with many very slender, elongate scales, pale ochraceous brown; legs grayish brown, becoming dark gray on outer surface. Abdomen above, and tufts, dark brownish gray, with thin whitish gray band at end of each segment; under surface covered with short dark gray scales.

UPPER SURFACE OF WINGS: Forewings grayish brown, with many black and dark brown transverse striations, one scale wide; cross lines outwardly angled, black, complete or partially obsolescent; basal line weakly indicated, strongly outwardly oblique; t. a. line arising on costa one-fourth distance from base, proceeding at right angle to costa then curving outwardly to middle of cubital cell, sharply angled inwardly to form point on anal vein, then outwardly angled to just above inner margin, thence basad to middle of margin; median area slightly darker than adjacent areas; t. p. line varying from



114

FIG. 114. Male Genitalia. *Catocalopsis medinae* (Bartlett-Calvert), Pucara, Neuquén Province, Argentina, February 25, 1953 (S. Schajovskoy; A.M.N.H.).

complete to obsolescent in anterior part of wing, when present arising on costa at one-half distance from base, curving outwardly to vein  $M_3$ , with sharp points on that vein and on veins  $Cu_1$  and  $Cu_2$ , deeply concave between all included cells and below vein  $Cu_2$ , outwardly bowed to anal vein, then curving basad to meet inner margin three-fourths of distance from base; t. p. line followed by pale, rather nebulous area below costa; s. t. line white or whitish gray at costa, outwardly curved to vein  $R_5$ , then becoming obsolescent in middle of wing, partially shaded basally by black scaling, with black scaling extending as outwardly oblique line from cubital cell to outer angle; terminal line black; fringe concolorous with wing. Hind wings bright red, with broad black border; anal margin narrowly gray; without maculation except for incomplete extradiscal line; posterior portion of black border, and fringes, with gray scaling, the fringe becoming paler anteriorly.

**UNDER SURFACE OF WINGS:** Forewings with basal area bright red, extending to broad, black, outwardly oblique t. p. line, its inner margin irregular, its outer margin even and not reaching outer angle, then connecting with elongate grayish black band along inner margin; outer portion of wing bright orange, with broad black terminal area, wide along costa, having prominent, white, elongate spot representing s. t. line, and becoming grayish black terminally; termin-

al line black; fringe grayish black. Hind wings bright red, with broad black border; extradiscal line as on upper surface; border of wing with broad white or whitish gray s. t. band, outwardly pointed in cells; outer portion of broad border grayish black; terminal line black; fringe grayish black opposite veins, paler between.

**LENGTH OF FOREWING:** 25 to 29 mm.

**FEMALE:** Similar to male, but tending to have less prominent maculation on the forewings.

**LENGTH OF FOREWING:** 28 to 30 mm.

**MALE GENITALIA:** As described for the genus.

**FEMALE GENITALIA:** As described for the genus.

**TYPE:** Location unknown. Bartlett-Calvert stated that the type was in the collection of Don José Toribio Medina.

**TYPE LOCALITY:** Valdivia (? city or province), Chile.

**DISTRIBUTION:** Central Chile (provinces of Arauco, Valdivia, and Linares) and the adjacent areas of Argentina (the provinces of Neuquén, Río Negro, and Chubut). In Chile the species occurs in both the coastal ranges and in the Andes.

**TIME OF FLIGHT:** January, February, and March.

**REMARKS:** Eleven specimens (eight males and three females) and four genitalic dissections (two males and two females) have been examined.



The color and maculation of the forewings is rather variable in *medinae*. On the basis of the limited material available, it appears that specimens from the coastal ranges of Chile may have

browner forewings, whereas the moths from the Andean region of both Chile and Argentina tend to be slightly grayer in coloration.

## SUMMARY

THE TRIBE NACOPHORINI, of the subfamily Ennominae, from the cool and cold temperate region of southern America is revised in the present study. Most of the species occur in the southern Andes Mountains, with nearly all of them occurring in Chile and Argentina.

As this group of the Nacophorini differs in some respects from the typical section of the tribe (revised by Rindge, 1961), the two groups are compared, and the present one is defined. In the typical group it was relatively easy to discern phylogenetic trends in a number of adult characters. However, in the group covered herein, this could not be done as the characters seem to form a mosaic, with no really clear-cut pattern of primitive or advanced forms. This is probably due to the presumed relatively recent origin of these moths in a highly varied montane region.

Nevertheless, I have tried to arrange the genera in a sequence that is believed to go from the more primitive to the more highly evolved.

Seven genera are included in this revision; two of them were originally placed in families other than the Geometridae, namely the Noctuidae and Notodontidae. Three of the seven genera are described as new. A total of 43 species are included; 22 are described as new, plus one heretofore undescribed subspecies. All the genera and nearly all the species are either described or redescribed; comparative notes are given for those taxa that were not personally examined. Distributional information is given for all species insofar as known. Keys are given for all genera and species. The adults and their genitalia are figured for all species and subspecies studied by the author.

## LIST OF SPECIES WITH THEIR KNOWN DISTRIBUTION

### GENUS *Dentinalia* HEIMLICH, 1960

- |                                     |                            |
|-------------------------------------|----------------------------|
| 1. <i>forsteri</i> Heimlich, 1960   | Chile                      |
|                                     | <i>Malleco</i> , NEW GENUS |
| 1. <i>versicolor</i> , new species  | Chile                      |
|                                     | <i>Talca</i> , NEW GENUS   |
| 1. <i>incurva</i> , new species     | Chile                      |
| 2. <i>absconda</i> (Heimlich), 1960 | Chile                      |

### GENUS *Salpis* MABILLE, 1885

#### GROUP I

- |  |                  |
|--|------------------|
| 1. <i>dentilineata</i> (Butler), 1882  | Chile            |
| 2. <i>gutta</i> , new species  | Chile            |
| 3. <i>inornata</i> , new species   | Chile            |
| 4. <i>tumida</i> , new species   | Chile, Argentina |
| 5. <i>tessera</i> , new species  | Chile            |
| 6. <i>batiola</i> , new species  | Chile            |
| 7. <i>sticta</i> , new species   | Argentina        |
| 8. <i>virgata</i> , new species  | Argentina        |
| 9. <i>mutabilis</i> , new species  | Chile            |
| <i>chilenaria</i> (Butler), 1882, not (C. Felder, R. Felder, and Rogenhofer), 1874 |                  |
| 10. <i>chilenaria</i> (C. Felder, R. Felder, and Rogenhofer), 1874                 | Chile, Argentina |
| 11. <i>crepera</i> , new species   | Chile            |
| 12. <i>lata</i> , new species  | Chile            |
| 13. <i>eudora</i> Prout, 1910  | Argentina        |
| 14. <i>felderi</i> (Butler), 1882  | Chile            |
| <i>chilenaria</i> (C. Felder, R. Felder, and Rogenhofer), 1874, female only        |                  |

#### GROUP II

- |                                   |       |
|-----------------------------------|-------|
| 15. <i>infelix</i> (Butler), 1882 | Chile |
|-----------------------------------|-------|

16. *unda*, new species Chile  
 17. *falcata*, new species Chile, Argentina

## GROUP III

18. *scodionata* Mabille, 1885 Chile  
     *scodionoeta* (sic!) auct.  
     *scodionoeta* (sic!) auct.  
 19. *albipunctaria* Mabille, 1885 Chile, Argentina  
 20. *lancea*, new species Chile  
 21. *unica*, new species Chile  
 22. *rubens* Prout, 1910 Argentina  
 23. *carneitincta* Prout, 1910 Argentina  
 24. *puechi* (Dognin), 1904 Bolivia  
 25. *brevis*, new species Chile  
 26. *orbifera* Prout, 1910 Argentina

## GROUP IV

27. *penai*, new species Chile  
 28. *glabra*, new species Chile, Argentina  
 29. *clarkei* Sperry, 1951 Chile  
     *notaturia* (Butler), 1882, not (Blanchard), 1852  
 30. *occulta*, new species Chile  
 31. *antennata* Mabille, 1885 Argentina  
 32. *aenea* (Butler), 1882 Chile  
 33. *tuberata*, new species Chile

GENUS *Praeantartica* HEIMLICH, 1956

1. *albida*, new species Chile, Argentina  
 2. *decisa* Heimlich, 1960 Chile  
 3. *indecisa* Heimlich, 1956 Chile

GENUS *Catophoenissa* WARREN, 1894

1. *dibapha* (C. Felder, R. Felder, and Rogenhofer), 1874  
     a. *dibapha* (C. Felder, R. Felder, and Rogenhofer), 1874 Chile  
         *albicentra* Ureta, 1956  
     b. *vesca*, new subspecies Argentina  
 2. *fuenzalidai* Ureta, 1956 Chile

*Catocalopsis*, NEW GENUS

1. *medinae* (Bartlett-Calvert), 1891 Chile, Argentina

## BIBLIOGRAPHY

- AMERICAN GEOGRAPHICAL SOCIETY  
 1945. Map of Hispanic America, 1:1,000,000. Washington, Government Printing Office.
- BARTLETT-CALVERT, WM.  
 1891. Some New, &c., Lepidoptera from Chili. Ent. Monthly Mag., ser. 2, vol. 2, pp. 312-317.
- BUTLER, ARTHUR G.  
 1882. Heterocerous Lepidoptera collected in Chili by Thomas Edmonds, Esq. Part III—Geometrites. Trans. Ent. Soc. London, pp. 339-427, pl. 16.
- DOGNIN, P.  
 1904. Heteroceres nouveaux de l'Amérique du sud. Ann. Soc. Ent. Belgique, vol. 48, pp. 358-369.
- FELDER, C., R. FELDER, AND A. F. ROGENHOFER  
 1864-1875. Reise der Österreichischen Fregatte Novara um die Erde . . . Zoologischer Theil. Zweiter Band. Zweiter abtheilung: Lepidoptera. Atlas, pp. 1-20, 140 pls., Wien.
- HEIMLICH, WILHELM  
 1956. Eine neue Notodontide aus Chile (Lep. Het.). Mitt. Münchner Gesell., vol. 46, pp. 308-310, pl. 14, 4 figs.  
 1960. Neue Geometriden aus Chile. Ent. Zeitschr., vol. 70, pp. 268-274, figs. 1-19.
- HERBULOT, C.  
 1970. Lepidopteres Geometridae des Iles Galapagos recueillis par M. et Mme. N. Leleup. Lambillionea, vol. 69, pp. 17-25.
- MABILLE, M. P.  
 1885. Diagnoses de Lépidoptères nouveaux. Bull. Soc. Philom. Paris, ser. 7, vol. 9, pp. 55-70.

- "1891" [1888]. Lépidoptères. In Mission Scientifique du Cap Horn, 1882-1883. Paris, Ministères de la Marine et de l'Instruction Publique, Gauthier-Villars et Fils, vol. 6, pt. 2, pp. Div. 1-Div. 35, pls. 1-3.
1889. Lépidoptères. In Lebruns, E., L. Fairmaire, and P. Mabille, Recherches sur les insectes recueillis pendant la Mission Chargée d'observer à Santa-Cruz de Patagonie le passage de Vénus. Nouv. Arch. Mus. Hist. Nat., Paris, ser. 3, vol. 1, pp. 139-160, pls. 10, 11.
- POOLE, ROBERT W.
1968. *Thyrintina trica* new species Insecta: Lepidoptera: Geometridae: Ennominae. Pilot Register Zool., card No. 25.
1969. A revision of the neotropical genus *Dasystole* (Lepidoptera: Geometridae). Jour. Kansas Ent. Soc., vol. 42, no. 3, pp. 276-285.
- PROUT, LOUIS B.
1910. On the Geometridae of the Argentine Republic. Trans. Ent. Soc. London, pp. 204-345, 1 pl.
- RINDGE, FREDERICK H.
1961. A revision of the Nacophorini (Lepidoptera, Geometridae). Bull. Amer. Mus. Nat. Hist., vol. 123, pp. 87-154, figs. 1-26.
1969. Reports on the Margaret M. Cary-Carnegie Museum Expedition to Baja California, Mexico, 1961. 6. The subfamily Ennominae (Geometridae: Lepidoptera). Ann. Carnegie Mus., vol. 41, pp. 25-44, 10 figs.
1970. Moths of the genus *Holochroa* (Lepidoptera, Geometridae) from the Tres Marias Islands, Mexico. Amer. Mus. Novitates, no. 2422, pp. 1-7, 7 figs.
- SCHAUS, W.
1929. New species of Heterocera (Lepidoptera) from southern Brazil. Proc. Ent. Soc. Washington, vol. 31, pp. 45-61, pls. 3, 4.
- SPERRY, JOHN L.
1951. Four South American Geometrid moths apparently undescribed. Bull. Southern California Acad. Sci., vol. 50, pp. 159-163.
- STAUDINGER, O.
- "1898" [1899]. Lepidopteren. In Ergebnisse der Hamburger Megalhaensischen Sammelreise, 1892/93. Hamburg, L. Friederichsen and Co., vol. 2, pp. 1-117, 1 pl.
- URETA R., EMILIO
1956. Nuevos Heteroceros (Lepidoptera) de Chile. Bol. Mus. Nac. Hist. Nat., Santiago, Chile, vol. 26, pp. 271-284.
- WARREN, WILLIAM
1894. New genera and species of Geometridae. Novitates Zool., vol. 1, pp. 366-466.
1895. New species and genera of Geometridae in the Tring Museum. *Ibid.*, vol. 2, pp. 82-159.
1907. American Thyrididae, Uraniidae, and Geometridae in the Tring Museum. *Ibid.*, vol. 14, pp. 187-323.

## INDEX OF SCIENTIFIC NAMES

Page numbers in boldface type refer to new names.

- |  |   |
|--|---|
| <p>absconda, Talca, <b>319</b><br/> aenea, Salpis, 372<br/> albicentra, Catophoenissa, 382<br/> albida, Praeantarctia, <b>375</b><br/> albipunctaria, Salpis, 350<br/> antennata, Salpis, 369</p> <p>batiola, Salpis, <b>334</b><br/> brevis, Salpis, <b>359</b></p> <p>carneitincta, Salpis, 356<br/> Catocalopsis, <b>386</b><br/> Catophoenissa, 379<br/> chilenaria, Salpis, 337<br/> clarkei, Salpis, 367<br/> crepera, Salpis, <b>338</b></p> <p>decisa, Praeantarctia, 376<br/> dentilineata, Salpis, 323<br/> Dentinalia, 312<br/> dibapha, Catophoenissa, 380<br/> dibapha, Catophoenissa dibapha, 382</p> <p>eudora, Salpis, 340</p> <p>falcata, Salpis, <b>346</b><br/> felderi, Salpis, 341<br/> forsteri, Dentinalia, 312<br/> fuenzalidai, Catophoenissa, 383</p> <p>glabra, Salpis, <b>363</b><br/> gutta, Salpis, <b>326</b></p> <p>incurva, Talca, <b>318</b><br/> indecisa, Praeantarctia, 377</p> | <p>infelix, Salpis, 343<br/> inornata, Salpis, <b>327</b></p> <p>jonesaria, Catophoenissa (?), 379</p> <p>lancea, Salpis, <b>351</b><br/> lata, Salpis, <b>339</b></p> <p>Malleco, <b>314</b><br/> medinae, Catocalopsis, <b>386</b><br/> mutabilis, Salpis, <b>336</b></p> <p>occulta, Salpis, <b>368</b><br/> orbifera, Salpis, 359</p> <p>penai, Salpis, <b>360</b><br/> Praeantarctia, 374<br/> puechi, Salpis, 357</p> <p>rubens, Salpis, 355</p> <p>Salpis, 320<br/> scodionata, Salpis, 350<br/> sticte, Salpis, <b>334</b></p> <p>Talca, <b>316</b><br/> tessera, Salpis, <b>332</b><br/> tuberata, Salpis, <b>373</b><br/> tumida, Salpis, <b>328</b></p> <p>unda, Salpis, <b>344</b><br/> unica, Salpis, <b>354</b></p> <p>versicolor, Malleco, <b>314</b><br/> vesca, Catophoenissa dibapha, <b>383</b><br/> virgata, Salpis, <b>335</b></p> |
|--|---|







