

**RECORDS AND DESCRIPTIONS OF  
MICROLEPIDOPTERA (7)**

by

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**OLETHREUTINAE**

(Eucosmidae auct., Eucosminae auct.)

Introduction

The study of the South Asiatic representatives of the subfamily Olethreutinae of the Tortricidae is difficult on account of various reasons. Our basic knowledge of this group of insects originates from the knowledge of the Palaearctic fauna; unfortunately the taxonomy, and especially the nomenclature of the European Olethreutinae has for a long time been in a deplorable state of confusion and only recent pioneer work along modern lines, chiefly by Obraztsov, leads to some order. Unavoidably this confusion throws a shadow upon the study of the Olethreutinae from other regions than the Palaearctis.

Since genital characters are of cardinal importance for the classification of the genera and species of the present group, it is clear that a fundamental revision is necessary, because nobody has ever bothered about these characters before, at least with regard to the South Asiatic fauna. When describing species from that region classic authors, as e.g., Snellen, usually chose a convenient generic name, familiar to the students of the Palaearctic fauna, to attribute them to; Meyrick, as conveniently, merged many species in one of some four of his enormous genera.

Many species of Olethreutinae are ornated with intricate markings that are very difficult to describe in a terse diagnose, as was the habit with those older authors; these descriptions are still more difficult to read! Other species are uniform to such an extent that their identification is impossible without the use of genital characters. Furthermore, Meyrick described a great number of species of Olethreutinae from South Asia, but he never figured a single one, nor did he ever publish a synopsis of this group, nor left us keys to the species, which would facilitate their discrimination.

In the course of later years a rich material of Olethreutinae came at my disposal. However eager to start with its study long ago, during my stay in the Tropics, I had to delay this revision till my return to Holland, as an investigation of numerous types in European museums was indispensable. The present paper is a first contribution towards this revision.

Some time ago I published a paper on the South Asiatic species of *Lobesia* in the Meyrick Collection in the British Museum (Diakonoff, 1950). At that time I was not able to compare with Meyrick's types any of the material that now is at my disposal. Consequently some corrections have since become necessary.

The reason for selecting this genus as a start for the revision of the Olethreutinae is because it possibly is one of the most difficult genera of the group to handle. The tropical species, with a few exceptions, are uniform, especially the females, and it is not possible to discriminate them superficially with any certainty. Meyrick already stipulated that, but this knowledge did not prevent his publishing of a number of superfluous names.

Quite recently Dr. Obratzsov (1953) published a review of the genus *Lobesia* and separated a series of species as a new genus, *Paralobesia*. It was fortunate for me that this excellent work was available: it was of great help for finding my way through the taxonomy and nomenclature of the Palaearctic species.

The present paper was originally intended as a revision of the Indonesian species of the genus *Lobesia* Guenée only. Afterwards it proved desirable to add general remarks on the morphology of the entire supergenus, and a critical review of its taxonomy with regard to several species from other regions. In the following pages one supergenus, three subgenera and eight species are described as new. Their types are preserved in the Leiden Museum. A few additional new species from the island of Sumba, from New Guinea, and from Madagascar will be described separately elsewhere.

I gratefully acknowledge the help of Mr. J. D. Bradley, British Museum (Natural History), who kindly assisted me with my study of types at that Museum; of Dr. L. G. E. Kalshoven, Blaricum, Holland, who provided valuable information on names of food plants; and of Dr. W. Vervoort, Zoological Laboratory of the University, Leiden, for taking the microphotographs.

#### General morphology

I am now completely in agreement with Dr. Obratzsov that *Lobesia* Guenée, 1845, and *Polychrosis* Ragonot, 1894, are congeneric, contrary to the generally accepted views of older authors, and to that of myself as for-

mulated in my above mentioned paper (1950), where I regarded *Lobesia* as a genus intermediate between *Polychrosis* and *Bactra* Stephens, 1834. The history of the first named two genera has already been summarized by Obraztsov (l.c.), so that we need not to repeat it here. In order to fully express my conception of the classification within the genus *Lobesia* I make use of subgeneric divisions.

The genera *Lobesia* and *Paralobesia* are closely allied but differ fundamentally in the structure of the male genitalia; besides, there are differences in the neuration of the fore wing, but it is variable to a certain extent, and hence of somewhat less importance. They have in common two peculiar structures: a pterostigma in both sexes, and a paired abdominal scent organ in the males. I shall now discuss these and some other characters of the present genera more elaborately.

**Pterostigma.** The pterostigma in the two genera appears as a thickening of the membrane of the fore wing in the region of the costa, along the terminations of veins 9-11, forming a somewhat raised patch along the edge of the wing, in its thickest portion accompanied by a slight prominence of the costal edge. It is more strongly developed in the males. A pterostigma is also characteristic of and often strongly developed in other groups of Microlepidoptera, e.g., in the Ethmiidae and especially in the Blastobasidae, etc.; whether this structure is homologous in the present genera and in those families, must remain outside this discussion. In *Lobesia* and *Paralobesia* the pterostigma apparently is formed by two structures: a local thickening of the wing membrane, and a peculiar arrangement of the scales on the upper side of the wing over that thickening. In a denuded wing the pterostigma appears to be covered with distinct transverse rows of punctures, being the bases of removed scales; these rows run perpendicularly to the costal edge of the wing, and are wedge-shaped, being dilated towards this edge. The interspaces between the rows of punctures are hyaline, and in those species where the wing membrane is strongly thickened they contain differently shaped and strongly refracting bars or cracks. The development of these additional structures runs parallel to the degree of thickness of the pterostigma; thus they are absent in *Paralobesia anderegiana* and *Lobesia euphorbiana*, where the pterostigma is hardly thickened at all, and can only be traced by rows of punctures (pl. I figs. 1, 2); in *Lobesia reliquana* the refracting structures are scarcely traceable (pl. I fig. 3); but they are strongly developed in the species with a thick pterostigma, as, e.g., in the tropical *L. fetialis* (pl. I fig. 4), and in the palaearctic *L. vitisana*, where bars are accompanied by also strongly refracting transverse cracks (pl. I fig. 5). The differences in the microscopical texture of the

pterostigma seem to be of specific value. However, this character is of little practical use, as only in species with considerably thickened pterostigma it can be seen in not-denuded wing (where it also forms a slight prominence of the costal edge of the fore wing, as was stated above). The presence of the pterostigma itself is of generic importance: all the species of *Lobesia* and *Paralobesia* seem to be in possession of it, but its development is gradational (in the above named species of *Paralobesia*, e.g., it is traceable only in a denuded wing, in transcient light, under the microscope).

**Position of costal veins in fore wing.** In the generotype of *Paralobesia*, *P. andereggiana*, the veins 10 and 11 are thickened, not sinuate, and run parallel to each other towards the edge of the wing (pl. II fig. 1); they do not distinctly reach this edge by far, however, as microscopical study shows (actually, neither of the costal veins can be traced to the very edge of the wing). The bases of these two veins are situated as far from each other as from vein 9; they become abruptly narrower at some distance below the margin of the wing and are obliterate terminally. Fig. 2 on pl. I shows that the neuration in the fore wing of the Palaearctic *L. euphorbiana* is exactly similar; it is different from the usual type of venation of *Lobesia* (pl. II figs. 3, 5). Therefore this species does not quite fit in the generic description of *Lobesia*, as this is formulated by Obraztsov. However, that author has already emphasized that not the neuration, but the genital apparatus of the males is of paramount importance for the separation of *Paralobesia* from *Lobesia*. After a study of a series of palae-arctic species of the latter genus that were available to me, I myself came to the conclusion that the interspecific variability of the neuration of the fore wing in these species is considerable, a large number of them following the type of *reliquana* (pl. II fig. 3), but a smaller number of species being in possession of an intermediate type of neuration between that of *reliquana* and that of *vitisana* (pl. II fig. 4). Consequently, the fact that *Lobesia euphorbiana* and *L. carduana* follow the type of the neuration of the closely allied genus *Paralobesia* does not, in my opinion, affect the validity of that genus, but only stresses the limited reliability of neuration as a generic (not as a subgeneric!) character in the present group. The two last named species represent a plesiomorph<sup>1</sup>) group of *Lobesia*; I place them in a separate subgenus (see below).

In the species of the genus *Lobesia* with the neuration of the *reliquana* type (pl. II figs. 3, 5) the veins 10 and 11 are not distinctly thickened;

1) The terms "plesiomorph", and "apomorph" have been adopted from Hennig (1951).

they are approximated to each other at their bases, distant from vein 9, and sinuate in their median portion, especially vein 10, as if they were pushed away from the wing margin by the strongly developed pterostigma; they do not reach as far towards the costal margin as these veins do in *Paralobesia* and in *Lobesia euphorbiana*. As was remarked above, the greater part of the palaeartic species of *Lobesia*, and invariably all the tropical species of that genus studied by me follow this type.

In a minor number of the palaeartic *Lobesia* species studied by me, the neuration of the fore wing is different from the *reliquana* type, viz., with veins 9-11 being tolerably equidistant, and only vein 11 being distinctly sinuate. This type of neuration possess, e.g., *limoniana* Mill., *littoralis* Westw. and *helychryzana* Rag.

In *vitisana*, at last, veins 10 and 11 are of about the same development and shape as in *reliquana*, but vein 10 originates from about one-third of the distance between the bases of the veins 9 and 11 (pl. II fig. 4).

Summing up we may state that the neuration of the fore wing in the present supergenus is variable to some extent, and therefore of little use for the separation of genera. However, I am inclined to ascribe more importance to the neuration than does Dr. Obratsov. In my opinion the neuration, when combined with the genital characters, is of great use for the separation of subgenera, as is evident from the taxonomic part of this paper. Actually, according to the classification presented below, the neuration varies from the "*Lobesia reliquana* type" to the "*Lobesia littoralis* type" only inside one of the proposed subgenera of the genus *Lobesia*; in the other five subgenera and in the genus *Paralobesia* the neuration is constant.

Reduction of the hind wing in the male. The hind wing in the males of various species of *Lobesia* is subject to a peculiar reduction of its surface which results in an abnormal shape of the wing and in simplification of the neuration. In the species with a normal wing (most palaeartic *Lobesia* species and, e.g., the *aeolopa* group of the oriental species) it is of the usual semioval shape, hardly narrower than in the female, with moderately and gradually narrowed apex, and with veins 2-5 all present and of normal length. The first stage of this reduction is manifest in the male of the palaeartic *L. reliquana*, where the hind wing is distinctly narrower than in the female, with a more acute apex and with slightly shortened veins 2-5. The extreme stage of reduction is acquired by the hind wings in males of the species of the *genialis* group (e.g., *genialis* Meyr., *fetialis* Meyr., *physophora* Low.). I already discussed this peculiarity

and figured the wing of a *genialis* male in 1950 (p. 290, fig. 2); the termen becomes deeply concave below the apex so that the apical portion of the wing forms a narrow lobe, while the veins 3 and 5 become very short, and vein 4 disappears completely. Intermediate stages of reduction of the hind wing between those two extremes may be observed in different oriental species. I shall mention them in the systematical part, separately for every species. Parallel to the reduction of the size of the hind wing and of its neuration, its clothing of scales is modified, the wing becoming more and more transparent at the base and in the cell, and sometimes acquiring rows of modified dark scales along certain veins on the under side.

The reduction of the hind wing in the male is not only an important specific character; it runs parallel to the development of the male genitalia, viz., from the type of the subgenus *Lobesia* towards that of the subgenus *Lomaschiza*, as discussed below.

**Male abdominal scent organ.** This paired organ has already been figured by Heinrich (1926, pl. 2 fig. 15) and by Obratsov (1953, fig. 1). It represents an oval pouch at either side of the first abdominal sternite (actually the united first and second abdominal sternites) in the male, beset on the inner surface with peculiar papilliform or oval, strongly thickened scales; the pouch has a longitudinal median split which apparently can be opened, thus exposing the inside of the pouch to the outside air. It seems to be a scent organ, serving for the attraction of the opposite sex. The shape and the size of the pouches, and the shape, the colour, and the amount of their scent scales differ considerably in various species; so the pouches are longer and the scales are yellowish in *L. genialis* Meyr., *fetialis* Meyr., *ambigua* spec. nov., *lithogonia* spec. nov., etc.; in *L. aeolopa* they are broader, and darker coloured; the pouches are shorter and broader, with black scales, in *L. rhombophora* spec. nov.; in a not yet described small species from Sumba Island, finally, this organ seems to be in a reduced state, the pouch is actually absent, and there is only a patch of small black scales in its place. In *Paralobesia andereggiana*, and *Lobesia euphorbiana* the pouches are also reduced to oval patches of small scales. In the strongly apomorph *extrusana* Walk. the pouches are present, but there are additional brushes of modified scent(?) scales: one at each side of the posterior ventral edge of the first and the second abdominal segments, respectively, and an unpaired patch of scales on the second segment (sternite), anteriorly.

These scent organs are typical of both *Lobesia* and *Paralobesia*, but absent in all the other genera of the Olethreutinae, as far as I know. They are of no importance for the subgeneric separation in *Lobesia*, but sometimes may be very useful for a quick separation of certain similar species, as, e.g.,

the very common Javanese *L. aeolopa* Meyr. from *rhombohora* spec. nov. However, this character is of limited practical use, the scent organs being concealed under the posterior coxae, and becoming visible only after removing the abdomen.

**Tibial pencil.** The male may possess an expansile pencil of long hairs on the posterior tibia, originating below base, and closely appressed to its inner side; in tropical species this pencil is usually exposed along its basal half, the apical half being concealed in a furrow formed by the scaling of the tibia. Dr. Obratsov already discussed this character at some length (1c., p. 85). The subgenus *Lomaschiza* possesses also a spread fringe of very fine hairs along the ventral side of the femur.

#### The male genitalia

The male genitalia of the supergenus are rather simple and characteristic. They are of paramount importance for the taxonomy of the group.

The tegumen is moderately developed and may be either rather robust and conical (*Paralobesia*), with two small apical lobes (nearctic *Paralobesia* species); or it is weak and mostly rounded (most *Lobesia* species) or flattened (*L. vitisana*).

The uncus is invariably absent.

The socius is either entirely absent (*L. indusiana* Z., *fuligana* Hw., *bicinctana* Dup., *littoralis* Westw.), or the socius is variably developed; it may be present either as a minute patch of small bristles (*euphorbiana*, *vitisana*, and some tropical species of the subgenus *Lobesia*), or as a distinct lateral lobe to the tegumen, clothed with bristles of variable length (*Paralobesia*, *L. reliquana* (Hb.), *L. porrectana* (Z.), etc.); finally, the socii may be strongly developed and shaped as large semioval discs, covering the top of the tegumen and clothed with long modified bristles (subgenus *Lomaschizodes* nov.).

The anal tube is membraneous and of considerable length, with the ventral surface along its greater part connected with the gnathos. An exception forms the subgenus *Lomaschiza* where the anal tube is free. In some species of *Lobesia* s.str. the anal tube is so delicate as to be almost untraceable.

The gnathos and the subscaphium are so closely united that it is not easy to discriminate these two parts in the subanal structure. Where I refer to the "gnathos" in the descriptions I actually mean the gnathos and the subscaphium together. The median portion of the organ that must represent its subscaphium part is usually also closely connected with the

ventral surface of the anal tube. Apparently this tube has been confounded with the subscaphium and not correctly reproduced in the figures. The gnathos in its simplest form is a weak transverse band (e.g., in *L. (Lomaschizodes) paradisea* Diak.), sometimes it may be shaped as a weak triangular transverse plate (*vitisana*, *littoralis*); usually the gnathos is shaped as a moderately sclerotized transverse rod with a more or less membranous median portion that emits a rising simple or plicate process, apparently the subscaphium proper, that is soldered with the anal tube (*Paralobesia*, many *Lobesia* species); most species of the subgenus *Lomaschiza* have a well-defined gnathos, shaped as a transverse rod with two rising median horns, verrucose or spinose, that are not connected with the anal tube.

The aedoeagus usually is tubular, moderately curved, little varying as to its length and hinged on a rather long, curved caulis. Only in the subgenus *Lomaschizodes* of *Lobesia* the aedoeagus is shorter, swollen (*extrusana* Walk.), or even bulbate (*paradisea* Diak.).

The above mentioned parts of the male genitalia are important for the separation of subgenera and species; however, they are of little use for the separation of the genera and for detecting their mutual correlations. It are the peculiarities of the valva and of its armature that form the most important characters for the classification of these insects, as I hope to demonstrate below.

The cucullus is rather slender and long; two basic forms may be discriminated, viz., (1) rather broad, curved, and obliquely clavate, or (2) gradually curved, but not clavate. The first type is, in my opinion, plesiomorph; I name it the "*Paralobesia* type". The second, apomorph, is called the "*Lobesia* type" of cucullus. Out of the second type may have developed the slender narrowed cucullus with sparsely bristled top, that I call the "*Lomaschiza* type".

The ventral side of the inner surface of the disc of the cucullus is covered with slender bristles. Sometimes these bristles are implanted in numerous rows and bending over the disc they cover the entire cucullus densely (*Paralobesia* and *Lobesia* types); sometimes these bristles are less dense and clothe only the lower margin of the cucullus, becoming sparse and fine towards its apical portion (*Lomaschiza* type); in the subgenus *Lomaschizodes* the marginal bristles may become stout and strong.

Often the ultimate group of these "cucullus bristles" situated along the border of the cucullus and the sacculus become stouter and longer and more similar to the spines of the sacculus; sometimes one or two of these bristles that are situated more medially acquire exceptional length (text figs.



20, 23, 27). Still these "cucullus bristles" should not be confused with "sacculus spines", for the reason explained below.

**The sacculus.** It was Heinrich (1923, 1926) who drew attention to the great importance for the classification of the Olethreutinae of the development and the position of the spiny armature of the sacculus. He recognised two groups or clusters of these spines and indicated them as  $Spc_1$  (usually being the distal cluster) and  $Spc_2$  (the proximal cluster); where there was only one cluster, he indicated it either with " $Spc_1$ ", " $Spc_2$ ", " $Spc_1 + Spc_2$ ", or simply with " $Spc$ ".

It may be remarked that Heinrich's indications of the spine clusters throughout his excellent study make the impression of being not always homologous. To take his second paper (1926), in his figure of "*Polychrosis*" (*reliquana*, pl. 7 fig. 41) there is only one spine cluster, indicated as  $Spc_2$ ; in fact, there are two clusters,  $Spc_1$  and  $Spc_2$ , interconnected by a narrow series of small marginal spines (cf. my fig. 5 on pl. III). (Obraztsov illustrated this situation more correctly (l.c., fig. 3), but in his figure the typical incision of the margin of the valva and the corresponding narrow space, devoid of bristles, that separate the cucullus from the sacculus, are not indicated; Pierce (1922, pl. 14, *reliquana*) figured the valva correctly, but omitted the gnathos). In some other of Heinrich's figures the indicated identity of spine clusters seems to me to be questionable. In his figure of *Zomaria* (pl. 12 fig. 59), e.g., I would prefer to call his  $Spc_1$ ,  $Spc_2$ , due to its position: his  $Spc_2$  is situated on the outer surface of the cucullus and can not be homologous with the spine cluster  $Spc_2$  of the sacculus. Neither can I agree with his figure of *Hedia* (pl. 13 fig. 62) where, in my opinion,  $Spc_1$  and  $Spc_2$  are confounded.

Now in the present group the cucullus is always clearly separated from the sacculus by a more or less extended incision of the outer edge of the valva. This I shall call the primary incision. The "cucullus bristles", however modified, stout or long they may be, are the elements of the cucullus and therefore can be situated only distad from this incision. In the same way the "sacculus spines" being the elements of the sacculus, can be found only proximad of the primary incision. I have the impression that this fact did not obtain the proper attention before. The situation in other groups of genera without a primary incision and with certain bristle and spine groups shifted distad may be less clear than in the present supergenus. Still the above mentioned correlation may be useful when retained. In any case it is important to try and clarify homologies of spine clusters in the Olethreutinae, otherwise they will be of little use for the study of mutual relationships within this subfamily.

There are either three clusters of spines:  $Spc_1$ , proximad of the separation of the sacculus,  $Spc_2$  proximad of  $Spc_1$ , seldom mediad of it (*Paralobesia andereggiana*), and basally, a third cluster, formed of flattened, usually very long spines. This cluster is indicated by Obraztsov as  $Spc$ ; to avoid confusion with Heinrich's terminology I prefer to call it  $Spc_3$ . This situation is characteristic of the genus *Paralobesia*, with the exception of one nearctic species with  $Spc_1$  absent (*liriodendrana* Kearf.) and another without  $Spc_3$ , but with  $Spc_2$  divided in two separate clusters (*viteana* Clem.). In the genus *Lobesia*  $Spc_3$  is invariably absent;  $Spc_1$  and  $Spc_2$  may both be present, and then entirely separated (subgenera *Lobesiodes*, text fig. 2, and *Lomaschiza*, text figs. 14, 18, 19), connected marginally (*reliquana*, pl. III fig. 5; more closely connected: *fuligana*, text fig. 3, *porrectana*, *bicinctana*; still more closely connected: *indusiana*, text fig. 4); finally,  $Spc_1$  and  $Spc_2$  may be united, so as to form a single cluster of spines. In *L. vitisana* with a single cluster its elements can still be discriminated, the proximal portion consisting of longer and less dark spines than the distal (pl. III fig. 6). A different situation is present in the *L. littoralis* group of species, to which several tropical species of the subgenus *Lobesia* belong: there is a large homogeneous distal cluster,  $Spc_1$ , sometimes accompanied by a small proximal cluster formed by a couple of spines only ( $Spc_2$ , text fig. 11); in this group  $Spc_2$  obviously is in a state of reduction, as it may be present or absent within the same species (e.g., *aeolopa* Meyr.); the single large cluster then present must be  $Spc_1$ . It may be remarked that since the primary incision separates cucullus bristles from sacculus spines,  $Spc_1$  may have developed out of  $Spc_2$ , or the reverse; or may have independent groups of hairs or bristles of the sacculus as its origin; but  $Spc_1$  can hardly have developed out of cucullus bristles.

In Pierce's work (1932, pl. 14) the valva of *L. euphorbiana* is figured with a distinct cluster of spines at the basal portion of the sacculus, which is confusing, as in this figure the cluster may be mistaken for  $Spc_3$ . Actually  $Spc_3$  is absent in that species (as was already stated by Obraztsov), but there is a small group of hairs on the outer surface of the valva at that place; in Pierce's figure the size of this group of hairs is exaggerated and its position is not clear.

The shape of the sacculus is also of great importance. Usually the development of the spine clusters and their separation is parallel to that of a second emargination of the outer edge of the sacculus that is situated between  $Spc_1$  and  $Spc_2$ , separating them. This I name secondary incision and I indicate the sacculus with this incision as scalloped sacculus (typical

for *Paralobesia*; furthermore for the subgenera *Lobesiodes*, *Lomaschiza*, and *Lomaschizodes*).

#### The female genitalia

The female genitalia are simple, and do not present a multitude of taxonomic characters. The ductus bursae and the bursa copulatrix usually are unarmed. However, the ostium with the colliculum are variegated and represent not only an excellent character for the discrimination of the species, but are also valuable for the separation of the subgenera *Lobesia* (tropical species) and *Lomaschiza*, being a smooth tube, with a limen in the former, and a short, aciculate or denticulate cylinder, without a limen, in the latter. Our knowledge of the female genitalia of numerous palaeartic species badly needs completion.

#### Phylogeny

The study of the phylogeny of any group of Lepidoptera, and of the present group in particular, is a slippery path. I venture to tread upon it only in order to elucidate my conception of the mutual affinity of the elements of the group in question.

For convenience's sake I call primary characters those that are most important and obvious in phylogenetic sense, and the less clearly so defined, secondary characters. The primary plesiomorph characters in the present group appear to be (1) the simple neuration of the *Paralobesia* type, (2) the weak gnathos, connected with the anal tube. The primary apomorph characters without doubt are (1) the specialised neuration of the *Lobesia reliquana* type, (2) the bicorn free gnathos of the subgenus *Lomaschiza*, (3) the narrow cucullus, and (4) the tendency to modification of the shape of the hind wing in the male in the last mentioned subgenus; finally (5) the development of the spine cluster  $Spc_3$ .

The nature of the secondary characters, that are less obvious, is manifest by the presence of the primary characters. Thus the clavate cucullus of the *Paralobesia* type that goes with the plesiomorph neuration must also be of a plesiomorph nature, as well as the scalloped sacculus, with  $Spc_1$  and  $Spc_2$  separated. On the contrary, the connected or united  $Spc_1 + Spc_2$  or a not clavate cucullus go with the apomorph neuration and must also be regarded as apomorph. The attenuation of the cucullus runs parallel to the modification of the male hind wing and, consequently, must also be of an apomorph nature.

In view of these considerations the phylogeny of the present group

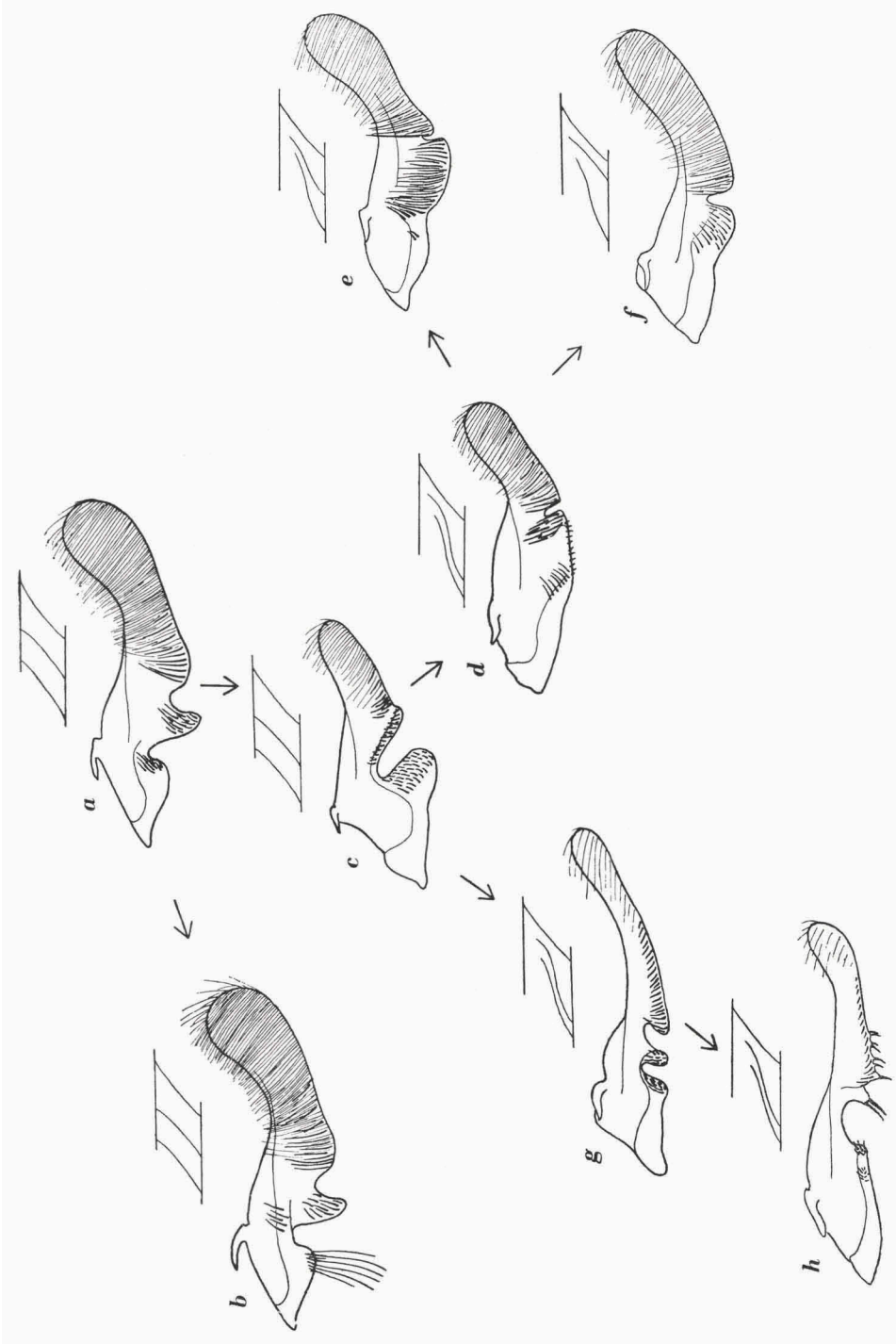


Fig. 1. Surmised phylogeny of the supergenus *Lobesia*. Explanation in the text.

appears to me to be as follows. A common ancestor of *Paralobesia* and *Lobesia* (text fig. 1a) was in possession of an unmodified neuration, with veins 9-11 in the fore wing equidistant and not sinuate, with a clavate valva and a scalloped sacculus with  $Spc_1$  and  $Spc_2$  separated by the secondary incision. From this ancestor developed (1) *Paralobesia*, with plesiomorph cucullus and sacculus but with a strong  $Spc_3$ , developed out of the hairs at the base of the sacculus (text fig. 1b), and (2) *Lobesia*, with an apomorph neuration. Subgenus *Lobesiodes* nov. represents an apomorph type with the neuration of the *Paralobesia* type still present, with a strongly scalloped sacculus but with a not clavate cucullus and without  $Spc_3$  (text fig. 1c). Out of the primitive *Lobesia* of the *reliquana* type (text fig. 1d) may have developed (1) the subgenus *Lobesia*, which went in two directions (a) that of a more or less simplified sacculus and not clavate cucullus; out of this type the subgenus *Polychrosis* may have developed (text fig. 1f); and (b) the type with plesiomorph clavate cucullus, but with simplified sacculus, with a reduced  $Spc_2$  (the *Lobesia* (*L.*) *littoralis* type, text fig. 1e). As an off-shoot of a primitive *Lobesia* (similar to the subgenus *Lobesiodes*) the considerably modified subgenus *Lomaschiza* may have originated (text fig. 1g), and along the same way the still more modified subgenera *Lomaschizodes* nov. (text fig. 1h) and *Apolobesia* nov. I tried to demonstrate this possible development of the present group in the diagrammatic text figure 1.

As to the relationships of the genera *Lobesia* and *Paralobesia* with other genera, in view of our limited knowledge of the genitalia of other Oriental Olethreutinae I prefer for the present to abstain from any speculations on this subject.

Having discussed the general aspects of the morphology of the present supergenus I present its classification, paying special attention to the South Asiatic species, and making a few remarks on those from other regions, when these are of especial interest.

#### Supergenus **Lobesia** Guenée, 1845, status nov.

Male genitalia with tegumen robust or weak, conical, rounded or flattened. Uncus absent. Gnathos unpaired, transverse portion membraneous or sub-membraneous, mostly with a median projection connected with the anus. Valva rather slender; cucullus moderate or slender, curved, either slightly clavate or narrowed or neither narrowed nor clavate; sacculus with a scalloped edge or simple, separated from the cucullus by an emargination.  $Spc_1$ ,  $Spc_2$ , and  $Spc_3$  either developed, or one or two of these clusters absent. Female genitalia with colliculum tubular or bulbate, aciculate or smooth; without signum. Fore wing in the two sexes with a pterostigma; when the

pterostigma is strongly developed, veins 10 and 11 are sinuate. Male with a paired scent organ on the first abdominal sternite; sometimes with an expansile pencil of hairs at the base of the posterior tibia; sometimes with modified hind wings. Fore wings in the two sexes mostly with uniform and characteristic markings.

Type of supergenus: *Lobesia* Guenée, 1845.

### **Paralobesia** Obraztsov, 1953

*Endopiza* Clemens, 1860 (nec *Endopisa* Guenée, 1845), Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 359.

*Polychrosis* Heinrich, 1926 (nec Ragonot, 1894), Bull. U.S. Nat. Mus. no. 132, p. 87.

*Paralobesia* Obraztsov, 1953, Tijdschr. Entom., vol. 96, p. 92.

Male genitalia with tegumen conical with top mostly bilobed. Gnathos submembranous, sclerotized laterally, median projection with a rising process, connected with the anal tube which is well-developed. Valva with cucullus curved, subclavate, densely bristled; sacculus scalloped, Spc<sub>1</sub> and Spc<sub>2</sub> present (Spc<sub>1</sub> absent as an exception), Spc<sub>3</sub> strongly developed, seldom absent. Fore wing with pterostigma ill-defined, veins 9, 10, and 11 equidistant, parallel, 10 and 11 not sinuate.

Type of the genus: *Coccyx andereggiana* Herrich-Schäffer, 1851. (Palearctic). The genus furthermore contains 16 nearctic species.

### **Lobesia** Guenée, 1845

*Lobesia* Guenée, 1845, Ann. Soc. Ent. France, ser. 2, vol. 3, p. 297. Type of the genus *Asthenia reliquana* Hübner, 1825 = *Tortrix permixtana* Hübner, 1811 (nec Schiffner, 1776), designated by Fernald, 1900.

*Polychrosis* Ragonot, 1894, *ibid.*, vol. 63, p. 209. Type of the genus: *Phalaena Tortrix botrana* Schiffner, 1776 (= *Phalaena vitisana* Jacquin, 1788), original designation. Synonym of *Lobesia* Guenée, according to Obraztsov, 1953, Tijdschr. Entom., vol. 96, p. 86.

*Lomaschiza* Lower, 1901, Trans. Roy. Soc. S. Austral., vol. 25, p. 68. Type of the genus: *Lomaschiza physophora* Lower, 1901, monobasic. Synonym of *Lobesia* Guenée, according to Meyrick, 1911, Proc. Linn. Soc. N. S. Wales, vol. 36, p. 258.

*Byrsoptera* Lower, 1901, Trans. Roy. Soc. S. Austral., vol. 25, p. 77. Type of the genus: *Byrsoptera xylistis* Lower, 1901, monobasic. Synonym of *Polychrosis* Ragonot, according to Meyrick, 1911, Proc. Linn. Soc. N. S. Wales, vol. 36, p. 256.

*Steriphotis* Meyrick, 1911, Proc. Linn. Soc. N. S. Wales, vol. 36, p. 259. Type of the genus: *Steriphotis peltophora* Meyrick, 1911 (= *Lomaschiza physophora* Lower, 1901), original designation. Syn. nov.

Male genitalia with tegumen weak, rounded or flattened. Gnathos either membranous, with a median process connected with the anus, or gnathos submembranous, with median portion bearing two rising horns, free of anus. Valva with cucullus either curved, subclavate and densely bristled, or slender, narrowed, and moderately bristled; sacculus either scalloped or simple, Spc<sub>1</sub> and Spc<sub>2</sub> present or Spc<sub>1</sub> absent; Spc<sub>2</sub> may be reduced, seldom

absent;  $Spc_3$  always absent. Fore wing with pterostigma well-developed; veins 9, 10, and 11 usually not equidistant, either (in some palaeartic species) 10 approximated at base to 9 and vein 11 sinuate, or (usually) 10 approximated at base to 1 and both these veins sinuate. Male with or without a pencil of hairs on posterior tibia.

In 1911 Meyrick declared correctly that *Lomaschiza* Lower, 1901, is a synonym of *Lobesia* Guenée, 1845, but on a following page he described a new genus, *Steriphotis*. During my recent study of Meyrick's Collection it became clear to me that the type of the genus, *Steriphotis peltophora* Meyr. is conspecific with *Lomaschiza physophora* Low., the type of the genus *Lomaschiza*. *Steriphotis* becomes a synonym of *Lobesia*, accordingly.

On the other hand, *Synthozyga* Lower, 1901, sunk by Meyrick as a synonym of "*Polychrosis*", is a distinct genus.

I divide the genus *Lobesia* into the following six subgenera:

1. *Apolobesia* nov.,
2. *Lomaschizodes* nov.,
3. *Lomaschiza* (Lower, 1901), new status,
4. *Polychrosis* (Ragonot, 1844) Obraztsov, 1953,
5. *Lobesia* (Guenée, 1845) Obraztsov, 1953 (partim),
6. *Lobesiodes* nov.

#### Subgenus **Apolobesia** nov.

Uncus bilobed. Gnathos with a long median sclerotized projection. Valva with slender cucullus, rather similar to that of the subgenus *Lomaschiza*, separated from the sacculus by a narrow but deep primary incision.  $Spc_1$  and  $Spc_3$  well-developed, but interconnected by a narrow, curved ridge. Aedoeagus with strong long spikes below its apex.

Type of the subgenus: *Lobesia sitophaga* Meyrick, 1922. (African).

#### **Lobesia (Apolobesia) sitophaga** Meyrick, 1922.

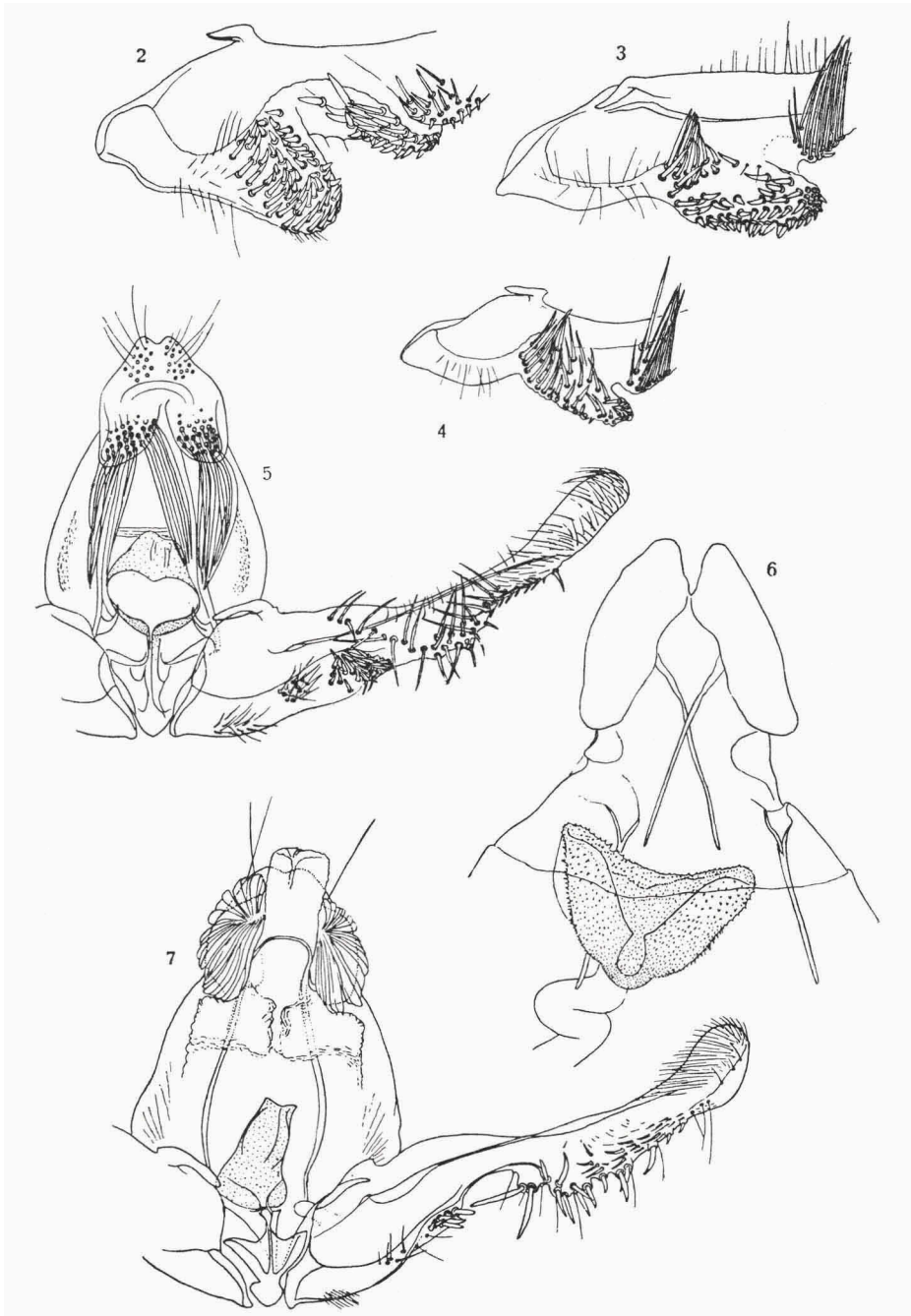
*Lobesia sitophaga* Meyrick, 1922, Exot. Microl., vol. 2, pp. 534-535 (♂).

Distribution: Africa, Uganda.

The unique specimen studied, the holotype, is of 29.II.1922, genitalia slide no. 7323, in the British Museum. All the records of the species from South Asia are erroneous, and refer to other species, as is recorded below. The genitalia will be figured in Mr. J. F. Gates Clarke's revision of Meyrick's types.

#### Subgenus **Lomaschizodes** nov.

Tegumen bilobed. Socius, a large flap, clothed with dense modified scales. Gnathos, a membranous transverse band, ill-defined, sometimes with a



Figs. 2-7. Genitalia of *Lobesia*. 2, sacculus of *Lobesia (Lobesiodes) euphorbiana* (Fr.); 3, the same of *L. (Lobesia) fuligana* (Hw.); 4, the same of *L. (Lobesia) indusiana* (Z.); 5, *L. (Lomaschizodes) paradisea* Diak., ♂; 6, *L. (Lomaschizodes) extrusana* (Walk.), ♀; 7, the same, ♂.



median projection. Valva with slender cucullus, along the lower edge beset with spines; the proximal of these spines sometimes forming an oblique series across the disc of the valva; sacculus with  $Spc_1$  well-developed, and isolated or absent;  $Spc_2$  represented by a well-isolated group of spines. Male with tibial pencil. Aedoeagus robust, short. Colliculum, a broad cup with aciculate wall.

Type of the subgenus: *Grapholitha extrusana* Walker, 1863. (Australian).

The two following species in their colouring and markings are somewhat different from the uniform *Lobesia* type; the general elements of these markings, the dentate central fascia, the subterminal spot, and the apical dot in the fore wings are still present in *extrusana*, but not more recognizable in *paradisea*; however, the third species, *tritoma*, closely related with the latter, has markings intermediate between those of *paradisea* and those of the "*Lobesia* type".

***Lobesia (Lomaschizodes) extrusana*** (Walker, 1863) (text figs. 6-7)

*Grapholitha extrusana* Walker, 1863, List Lep. Het. Brit. Mus., vol. 28, p. 24? (♂; Moreton Bay).

*Steriphotis extrusana*, Meyrick, 1911, Proc. Linn. Soc. N. S. Wales, vol. 36, pp. 259-260 (♀; Brisbane).

Distribution: Australia, Queensland.

Male genitalia (text fig. 7). Tegumen weak, rounded, emarginate. Socius large, semioval, densely covered with dark brown modified scales. Gnathos membranous, a transverse band, plicate in its middle, with a large median process, bilobed at the top, that may be the anal tube proper. Valva rather slender, cucullus sparsely haired, below its top covered along the margin with not numerous strong spines;  $Spc_1$  formed by two large spines only, placed on a projecting knob; sacculus scalloped and modified, secondary incision very broad,  $Spc_2$  is a small group of short spines. Caulis rather short. Aedoeagus short and broad, but longer than the caulis, with a bulbate base. Cornuti absent. (Specimen studied and figured: 1♂, "Toowong, Queensland, 9.XI.1897. Dodd. No. 19575", in Walsingham's Collection. Genitalia slide no. 1749 D).

Abdominal scent organ apparently in reduction, pouches small and narrow, with not numerous pale scales. Additional brushes of scent scales present: a lateral pair on each first and second abdominal sternites, respectively, and a plate covered with modified scales, in the middle of the second sternite.

Tibial pencil in male reaching  $\frac{5}{6}$  of the length of tibia, light fuscous.

Female genitalia (text fig. 6). Colliculum and ostium, a large and broad funnel, inverted-triangular in ventral aspect, with a deep incision in its

frontal wall; spinulose. Ductus bursae very short, simple. Bursa copulatrix, a simple, elongate sack. (Specimen studied and figured: 1 ♀, "Toowong, Queensland. 9.II.1897. Dodd. No. 17509", in Walsingham's Collection. Genitalia slide no. 1750 D).

**Lobesia (Lomaschizodes) paradisea** Diakonoff, 1953 (text fig. 5)

*Lobesia paradisea* Diakonoff, 1953, Verh. Kon. Ned. Ak. Wet., Nat., ser. 2, vol. 49, no. 3, pp. 90-93, figs. 308-310 (♂, ♀).

Distribution: Netherlands New Guinea, Snow Mountains.

Male genitalia (text fig. 5). The original description (p. 92) must be somewhat emended as follows. Tegumen weak, with bilobed and bristly top. Uncus absent. Socius large, pending, covered on its lower portion with very long, transparent scale-like bristles, ornate with fine longitudinal stripes. Gnathos, a weak membraneous narrow transverse band. Valva slender; cucullus with strong sparse spines, beginning under the top, ultimate row obliquely traversing the disc of the valva; sacculus hardly scalloped, primary incision shallow, secondary incision represented by an impression of the margin of Spc<sub>2</sub>; Spc<sub>2</sub> well-developed, a triangular patch of short spines, Spc<sub>1</sub> absent. Caulis short. Aedoeagus broad, bulbate. (Genitalia slide no. 808 D, holotype). In my original figure the transparent bristles of the socius and the weak gnathos have been omitted. I reproduce it here after correction (text fig. 5).

The spine cluster Spc<sub>2</sub> is very similar to that in the preceding species, but there is no Spc<sub>1</sub>. Nevertheless I place these two species in one subgenus, judging from the peculiar socii, and from the general shape of the genitalia.

Female genitalia. Colliculum and ostium, a broad spinulose cup; dorsal wall high, with a quadrate pad in its middle, ventral wall low, simple. For further particulars I refer to my original figures (i.e., figs. 308-309) and description.

**Lobesia (Lomaschizodes) tritoma** Diakonoff, 1953

*Lobesia tritoma* Diakonoff, 1953, Verh. Kon. Ned. Ak. Wet., Nat., ser. 2, vol. 49, no. 3, p. 93, figs. 306-307 (♀).

Distribution: Netherlands New Guinea, Snow Mountains.

The male is unknown. The female genitalia are very similar to those of *paradisea*, the ostium + colliculum being a smaller and less robust pileate cup, also with a thickened pad of the dorsal wall. The markings of this species, however, although resembling those of *paradisea*, follow much more the usual *Lobesia* type, as was remarked above.

Subgenus **Lomaschiza** Lower, 1901, status nov.

*Lomaschiza* Lower, 1901, Trans. Roy. Soc. S. Austral., vol. 25, p. 68.

*Steriphotis* Meyrick, 1911 (partim), Proc. Linn. Soc. N. S. Wales, vol. 36, p. 259.

Gnathos usually submembranous, seldom sclerotized, with median portion bearing two rising verrucose or spinose processes, free of the anus. Valva with slender, narrow cucullus, densely bristled only along its lower edge, sparsely haired towards the top and the costa; sacculus scalloped, Spc<sub>1</sub> and Spc<sub>2</sub> present, as a rule completely separated by the secondary incision. Colliculum (and ostium) aciculate, short-tubular or bulbate. Male with a tibial pencil, and with a modified hind wing, with a row of scales along vein 1 b on the under side.

Type of the subgenus: *Lomaschiza physophora* Lower, 1901. (Australian).

Several Indo-Australian species belong here.

**Lobesia (Lomaschiza) fetalis** (Meyrick, 1920) (text figs. 16, 18, pl. III figs. 2, 3)

*Polychrosis fetalis* Meyrick, 1920, Exot. Microl., vol. 2, p. 346 (♂; Bengal). Fletcher, Mem. Dept. Agr. Ind., Ent., 1920, vol. 6, p. 53 (biology). Diakonoff, Bull. Brit. Mus., Ent., 1950, vol. 1, p. 292, pl. 3 fig. 6 (genit. ♂), pl. 4 fig. 12 (genit. ♀) (holotype cited, genitalia of the two sexes described).

*Lobesia aeolopa* Fletcher, 1921 (nec Meyrick, 1907), Mem. Dept. Agr. Ind., Ent., vol. 6, p. 53 (biology, food-plants).

*Lobesia fetalis*, Fletcher, Imp. Counc. Agr. Res., Sci. Monogr., no. 2, p. 27, 1932 (biology, food-plants).

Type locality; India, Bengal.

Distribution outside Indo-Malayan Archipelago: India, Bengal, Pusa.

♂ 11-15 mm. Head whitish-ochreous, tufts on vertex pale ochreous-fuscous, anteriorly becoming suffused with darker fuscous. Antenna brownish, narrowly ringed with pale ochreous, scape pale ochreous. Palpus with basal and terminal segments, and tip of median segment whitish-ochreous or whitish, median segment except tip pale tawny, becoming paler towards base, irrorated with dark fuscous, so as to form a dark fuscous subapical band. Thorax pale ochreous, irregularly mixed and spotted with brownish-fuscous, a broad brownish-fuscous or fuscous transverse band occupying anterior fourth of thorax and anterior half of tegula, an irrorated brownish spot before apex of tegula (slightly shifted medianly out of the middle of the tegula); posterior crest strong, U-shaped, brownish. Legs, anterior femur and tibia white ventrally, elsewhere pale ochreous, densely irrorated with dark brown, tibia with a subapical and an apical pale ochreous ring, tarsus pale ochreous, suffused with dark brown above except pale ochreous rings around articulations of segments; posterior leg ochreous-white with a fringe of white silky hairs above, tarsus irrorated

with brown, articulations of segments pale-ringed; posterior femur with a fringe of fine white hairs ventrally, posterior tibia with a shiny white pencil reaching to top of tibia. Abdomen long, slender, flattened dorso-ventrally; fuscous, slightly paler on first and second tergites, eighth tergite slightly tinged ochreous, marked with brown at base; valvae whitish; venter pale fuscous or greyish. Abdominal scent pouches oval, rather short and broad, with dense broadly oval yellowish scales.

Fore wing narrow, elongate, dilated; costa faintly convex along basal fifth, gently concave from beyond one-fifth to pterostigma; pterostigma strong, thickened, strongly projecting along costal edge; costa beyond pterostigma almost straight, apex rounded, termen gradually and moderately rounded, strongly oblique. Pale ochreous, partially irrorated with brownish-grey, costal edge narrowly white; markings light tawny and fuscous-brown. Basal patch reaching to before one-third of wing, edge convex, with upper half hardly curved, lower half more strongly rounded; this patch is divided in three parts: a large, wedge-shaped median fuscous-grey blotch, occupying more than the central half of basal patch, and reaching from just below costa to dorsum; a narrow, wedge-shaped basal transverse fascia, and a fascia of the same colour forming the posterior edge of the basal patch; dark markings of basal patch arranged as follows: an oblique transverse striga before the edge of the basal streak, a narrow strigula across the middle of the grey blotch, angulate above fold, and a pair of interrupted marginal strigulae along the edges of the posterior tawny fascia, more distinct on costa, confluent in the middle of the disc, so as to form a distinct transverse discal spot, more or less edged with whitish-ochreous; the area separating the basal patch from the central fascia whitish-ochreous, with the lower half almost entirely occupied by a suffused triangular mark of fuscous-grey irroration, with the acute top sometimes continued towards costa by a series of grey points; a series of brown points along costa; central fascia median, formed by a vertical band of tawny suffusion, with the anterior edge gently sinuate, the posterior edge produced into an upturned large tooth in middle; a dark brown streak along upper half of this posterior edge to top of tooth; pterostigma with a dark brown, slightly postmedian triangular costal spot, preceded by a narrow, oblique tawny costal strigula, followed by a short marginal costal streak of the same colour; below pterostigma a brown point, and an oval tawny spot centred with brown; space around pterostigma suffused with grey; a narrow well-defined brown line in middle of wing breadth beyond posterior projection of central fascia; an oblique triangular spot of brown irroration on dorsum before tornus, with acute point slightly turned obliquely outwards; terminal spot variably shaped,

mostly rounded-pearshaped, with slightly truncate top, lower anterior edge suffused; this spot sometimes irrorated with brown on termen; apical spot rounded, tawny, anterior half shaded with brown; apical spot preceded by a narrow interrupted oblique brown line, dilated into a triangular tawny spot on costa, and forming a group of irregular minute dark markings on termen below apex. Cilia pale ochreous, becoming paler towards tornus, brighter and tawny towards apex, divided by a minute pale basal, a subbasal, and a subapical line, area between the first and the second lines marked with brown opposite the dark wing markings, area between the second and the third lines sometimes tinged greyish; cilia around apex suffused with brown, on dorsum with a grey bar.

Hind wing deformed: apex rather pointed, forming a long lobe, termen being obliquely rounded below apex (between veins 6 and 7), thence gently sinuate and running almost horizontally to terminations of veins 3-5 across about two-fifths of the wing length, thence moderately rounded and slightly emarginate on terminations of veins as far as the anal angle, which is strongly projecting, and rounded. Vein 2 short, curved upwards at base, veins 3 and 4 coincident, extremely short, as well as 5, which is parallel to 3 + 4, 6 and 7 connate. Hyaline, with faint prismatic reflections; apical lobe suffused with fuscous, with veins streaked with darker fuscous; sometimes a rounded fuscous shadow on vein 1b before the edge of the wing. Cilia white, touched with fuscous, more so around apical lobe; around anal lobe and on dorsum shining silvery-white.

Male genitalia (text fig. 18, pl. III figs. 2, 3). Tegumen with a broad, rounded top. Socius represented by a blunt triangular projection at each side, bearing a group of minute bristles. Gnathos large, free of anus, its arms folded upwards below base, and projecting laterally at the fold; median portion of gnathos membranous, upper edge bearing two strong horn-like processes, their surface adorned with numerous small longitudinal wrinkles, extending over the base of the horn, and medianly downward over the membranous portion of the gnathos, so as to form a triangular wrinkled field there. Valva long, cucullus narrow, cucullus bristles rather long; sacculus moderately broad,  $Spc_1$ , a moderate, rounded cluster, separated from  $Spc_2$ . Caulis very long. Aedoeagus pistol-shaped; cornuti, one large, and two to three smaller spikes. (Slide figured: 1394).

♀ 9.5-11.5 mm. Head and thorax as in male. Abdomen pale golden-ochreous-whitish, densely and finely irrorated with light greyish-fuscous, venter whitish-fuscous with faint bronzy gloss, posterior half with a median streak, and two submedian faint grey longitudinal streaks.

Fore wing broader and shorter than in male, of normal shape, but with

pterostigma strongly developed, thickened, prominent on upper surface of wing, and also along costal edge, less developed than in male, but stronger than in females of any other Indo-Malayan species except *genialis*. Wing usually stronger irrorated and strigulated with brown than in male, the strigulae being more distinct and broader; space between basal patch and central fascia sometimes narrower, terminal patch variable, as a rule obliquely oval, with truncate top. Sometimes ground colour stronger suffused throughout with leaden-grey. Cilia darker, ochreous-brownish, or tawny-brownish, less pale towards tornus.

Hind wing of normal shape; veins 3 and 4 connate, 5 curved and approximated to 4 at base, but still rather distant, 6 and 7 closely approximated towards base. Rather dark brown-fuscous or fuscous, sometimes becoming distinctly paler towards the base. Cilia varying from whitish-fuscous with fuscous basal shade, and a narrow pale basal line, to rather suffused with greyish-fuscous, with darker fuscous base, pale basal line, and white tips.

Female genitalia (text fig. 16). Colliculum tubular, narrowest below middle, gradually dilated towards top, less dilated towards base, which is emarginate. Signum absent. (Slide figured: 1423).

The male is very distinct by the peculiar shape of the hind wing, very similar to that in *L. (Lom.) genialis* Meyr. and in *L. (Lom.) physophora* Low.; except for that feature *fetialis* is an extremely variable species as to the shape of the fore wing, which may be narrower, and more pointed or broader, with rounded apex; it is also variable with regard to the colouring, which varies from tawny to fuscous, and with regard to the markings, that are subject to still more variations than the other characters mentioned. The female may provisionally be identified, but only after considerable practice, and never with absolute certainty, by the well-developed pterostigma which is more concave along the costal edge, and more prominent upon the upper surface of the wing than in any other species of the genus concerned. The above description is based upon a brightly coloured specimen from Telawa, Central Java. The single specimen from Depok, West Java, is exceptionally greyish-tinged, the fuscous colouring being replaced by light fuscous, the pale ochreous tinge of the ground colour by almost white; still there is no proof of these peculiarities, however distinctly pronounced, to be of subspecific order and not to fall within the range of the variability of the species.

Material studied. West Java. Buitenzorg, 250 m, 1884, no. 7555, "orig. afb."<sup>1)</sup>, "*A. anderreggana* Guen., det. Sn." (!), the largest

1) "Orig. afb." = "origineele afbeelding" (original drawing), a narrow label written in ink in Snellen's hand, means as much as a type label! Snellen did not indicate any

male studied (15 mm), abdomen missing (Coll. Snellen). Depok, 50 m, V. 1948, 1 ♂ (genit. slide 1394) (A. Diakonoff).

Central Java, Semarang, Telawa, 40 m, teak forest, bred from larvae in living fruit of *Lantana camara* (Verbenaceae), 3. VIII. 1933, no. 488, 1 ♀; 15. I. 1938, no. 2091, 1 ♂; 5. II. 1938, no. 1384, 2 ♀; 7. II. 1938, no. 3084, 2 ♀; 13. II. 1938, no. 3095, 1 ♂, 1 ♀; 24. II. 1938, no. 3091, 1 ♀ (genit. slide 1475); 17. III. 1938, no. 3095, 1 ♂, 3 ♀; 18. III. 1938, no. 3095, 1 ♂; 20. III. 1938, no. 3095, 1 ♂, 3 ♀; 21, 28. III. 1938, no. 3095, 2 ♂; 24. III. 1938, no. 3095, 1 ♂, 1 ♀; 11. IV. 1938, no. 3091, 1 ♂; 18. VIII. 1938, no. 3095, 1 ♀ (genit. slide 1423) (L. G. E. Kalshoven). The same locality, bred from larvae in fresh fruit of ? *Bridelia* sp. (Euphorbiaceae), 7. VIII. 1934, no. 747, 1 ♀; 23. VIII. 1934, no. 715, 1 ♂ (genit. slide 1396) (L. G. E. Kalshoven). The same locality, bred from larvae in inflorescence of "gadel", 23. VIII. 1935, no. 1611, 1 ♀; in inflorescence of "krandang", 2. VIII. 1934, no. 729, 1 ♀, and in inflorescence of "sobah", 18. VIII. 1935, no. 1589, 1 ♂ (L. G. E. Kalshoven). The same locality, no indication of food plant: 14. VIII. 1933, no. 488, 1 ♀; 12. VIII. 1935, no. 1589, 1 ♀, 5. II. 1938, no. 3007, 1 ♀ (genit. slide 1491) (L. G. E. Kalshoven). Semarang, Seneng, 40 m, teak forest, bred from larvae in fresh fruit of *Lantana camara*, 27. VI. 1931, no. 549, 1 ♀; 2. VII. 1931, no. 263, 1 ♀; 10. VII. 1931, no. 264, 1 ♂; 21. VII. 1931, no. 997, 1 ♀ (L. G. E. Kalshoven). Bred from larvae in flowers of *Evodia accedens* (Rutaceae), 21 and 22. VII. 1932, no. 997, 2 ♀ (L. G. E. Kalshoven). Bred from larvae in inflorescence of *Clerodendron serratum* (Verbenaceae), 30. III. 1931, no. 476, 1 ♀; 21. IV. 1931, no. 489, 2 ♂; 1. VII. 1931, no. 263, 1 ♀; 10. XII. 1931, 1 ♂; 11. XII. 1931, no. 680, 1 ♂, 1 ♀; 20. XII. 1931, no. 726, 1 ♀ (L. G. E. Kalshoven). Bred from larvae in fruit of ? *Tarenna incerta* (Rubiaceae), 6. V. 1931, no. 264, 1 ♂ (L. G. E. Kalshoven). Bred from larvae in leaves of *Barringtonia spicata* (Lecythidaceae), 2. VII. 1931, no. 273, 1 ♀ (genit. slide 1486) (L. G. E. Kalshoven). Seneng, without indication of food plant: 24. VI. 1931, no. 543, 1 ♀ (genit. slide 1477); 22 and 25. VI. 1931, no. 543, 1 ♂, 1 ♀; 22 and 27. VI. 1931, no. 997, 2 ♂; 28. VI. 1931, no. 543, 1 ♀ (genit. slide 1455); 30. VI. 1931, no. 264, 1 ♂; 22. IX. 1931, no. 463, 1 ♀, 10. XII. 1931, no. 663, 1 ♂; 11. XII. 1931, no. 680, 1 ♂ (L. G. E. Kalshoven). Either from Seneng or from Telawa, but labelled only "Java, Semarang", or "Java, teak forest": bred

types but always chose for illustration of his papers the best preserved specimen. In vain did I look for any note or paper with a reference or a reproduction of the species—apparently it has never been published by Snellen.

from larvae in fruits of "gimpol", 6. X. 1931, no. 720, 1 ♀; 9 and 10. X. 1931, no. 720, 2 ♂; bred from larvae in flowers of ? *Bridelia* sp. (Euphorbiaceae), 26. VI. 1931, no. 543, 1 ♂; bred from larvae in flowers of *Clerodendron serratum* (Verbenaceae), 8. V. 1931, no. 498, 1 ♂; bred from larvae in fruits of *Allophylus cobbe* (Sapindaceae), 4. I. 1932, no. 778, 1 ♀ (genit. slide 1488). Without indication of food plant: 7. I. 1932, no. 775, 1 ♀ (L. G. E. Kalshoven). Pekalongan, 5 m, bred from larva in flower bud of *Jasminum ? sambac* (Oleaceae), IX. 1939, 1 ♀ (R. Awibowo) (genit. slide 1481).

East Sumatra, Fort de Kock, 920 m, 1926, 1 ♂, abdomen missing (E. Jacobson).

Except for a series of female specimens named "*Lobesia aeolopa*" all the material from the Institute for Plant Diseases and Pests of Bogor, that apparently has been studied by Meyrick, has been identified as *Lobesia genialis*. However, there is not a single female specimen of *genialis* from Java in his collection in the British Museum.

***Lobesia (Lomaschiza) genialis* Meyrick, 1912 (pl. III figs. 1, 4)**

*Lobesia genialis* Meyrick, 1912, Journ. Bombay Nat. Hist. Soc., vol. 21, p. 869 (♂, Ceylon). Fletcher, Mem. Dept. Agr. Ind., Ent., 1920, vol. 6, p. 54-55 (biology in South India). Diakonoff, Bull. Brit. Mus., Ent., 1950, vol. 1, p. 290, 292, fig. 2 (neur. ♂), pl. 3 fig. 4 (genit. ♂) (holotype cited, genitalia described, specimens from Coimbatore referred to *L. dryopelta* Meyr.).

Distribution: Ceylon.

This species is closely allied to *fetialis*; it can be separated by small but constant differences in the male genitalia (the female of *genialis* is unknown): the horns of the gnathos are pointed (in *fetialis* obtuse), the lower angle of the cucullus is projecting (in *fetialis* not projecting), Spc<sub>1</sub> broader and shorter than in *fetialis*. These differences are shown in photographs, figs. 1, 4, and 2, 3 of pl. III that were taken of the holotypes of the two species, and kindly put at my disposal by the Trustees of the British Museum.

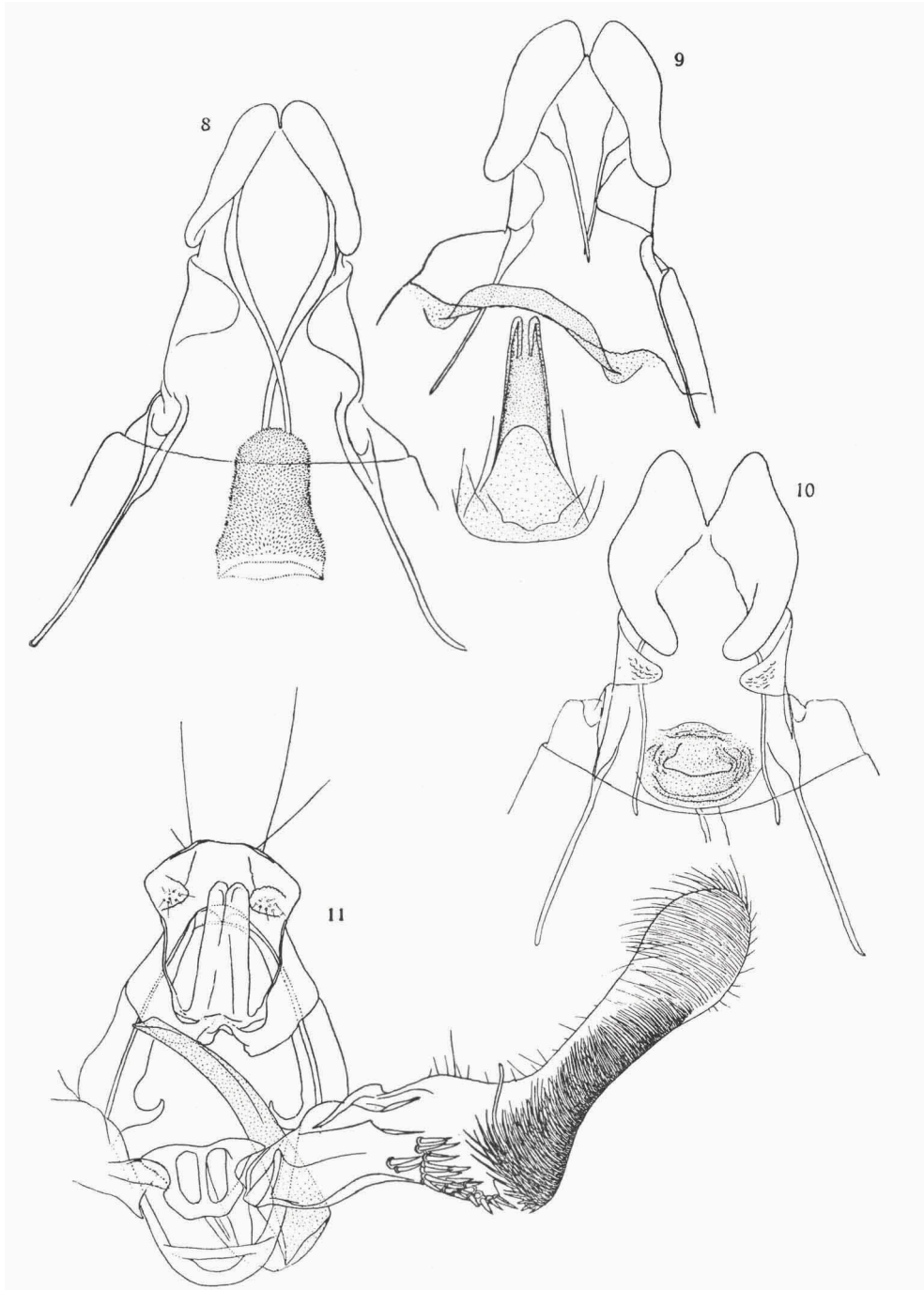
***Lobesia (Lomaschiza) physophora* (Lower, 1901) (text figs. 17, 19)**

*Lomaschiza physophora* Lower, 1901, Trans. Roy. Soc. S. Austral., vol. 25, p. 69.  
*Lobesia physophora*, Meyrick, 1911, Proc. Linn. Soc. N. S. Wales, vol. 36, p. 258.  
*Steriphotis peltophora* Meyrick, t.c., p. 259. Syn. nov.

Distribution: Australia, Queensland.

This Australian species is superficially similar to the two preceding. Male genitalia (text fig. 19). Very similar to those of *L. (Lom.) genialis* Meyr. (cf. pl. III figs. 1, 4). Different are the horns of the gnathos, which





Figs. 8-11. Genitalia of *Lobesia*. 8, *Lobesia (Lomaschiza) rhombophora* spec. nov., ♀; 9, *L. (Lobesia) ambigua* spec. nov., ♀; 10, *L. (Lomaschiza) ultima* spec. nov., ♀; 11, *(Lomaschiza) ambigua* spec. nov., ♂.

are shaped like a sheaf of spines, and ending in numerous sharp points (in *fetialis* the top of each horn is obtuse, in *genialis*, with one sharp tooth); furthermore the horns are not diverging towards the top, as in the other two species. The caulis is a trifle longer. The ultimate cucullus bristles are concentrated marginally and do not extend along the entire edge of the primary incision, as in *genialis*;  $\text{Sp}_1$  and  $\text{Sp}_2$  are contiguous at the bottom of the secondary incision (in *genialis* interconnected by hairs). The figured genitalia are of a specimen from the Meyrick Collection, labelled "Townsville, Queensland, F. P. D., 4.7.01"; genitalia slide no. 1753 D.

Abdominal scent organ ill-defined, with narrowly semioval pouches, with a few pale scales.

Tibial pencil long, slender, white, exposed along its basal portion, concealed posteriorly in a furrow of the clothing of the inner side of the tibia, but reaching to the top of the tibia.

Female genitalia (text fig. 17). Also closely approaching those of *genialis*: the colliculum with the caudal half almost cylindrical, gently dilated upwards, the rostral half abruptly swollen and rounded (its rostral edge sometimes narrowed again, no 1748). In *fetialis*, on the contrary, the colliculum is dilated along its upper half.

Material studied: "*Lobesia physophora*", from the Meyrick Collection, labelled in Meyrick's hand: "Townsville, Queensland, F. P. D., 4.7.01", 1 ♂, genitalia slide no. 1753 D (text fig. 19). "*Steriphotis peltophora*", from the Walsingham Collection, "Townsville, Queensland, e.l. *Clerodendron tomentosum*, ex. 4.VIII.1901. Dodd", 1 ♂, genitalia slide no. 1745 D. 1 ♀, genitalia slide no. 1746 D; further "Townsville, Queensland, e.l. *Petalostigma quadriloculare*, ex. 6.X.1901. Dodd". 1 ♂, genitalia slide no 1747 D. 1 ♀, genitalia slide no. 1748 D (text fig. 17).

***Lobesia (Lomaschiza) albotegula* spec. nov.**

♂ 11.5 mm. Head creamy-white, collar dark grey. Antenna whitish, ringed with fuscous, scape whitish, black below. Palpus fuscous-greyish, median segment with upper and lower edges and a broad transverse subapical band black, apex white; terminal segment rather long, subobtuse; creamy-white. Thorax fuscous-grey, with a faint whitish median and a postmedian transverse band, posterior crest blackish, tips of scales narrowly white; tegula white, basal third tawny-fuscous, posteriorly edged with blackish. Shoulder tawny-fuscous, edged with blackish. (Abdomen missing). Legs whitish tinged ochreous, infuscated in the usual way, posterior femur with a fringe of white hairs ventrally, posterior tibia glossy light grey; pencil of posterior tibia

slender, leaden-grey, concealed along its posterior portion in the scales of the tibia.

Fore wing elongate-subovate, pointed; costa straight anteriorly, hardly curved before apex, pterostigma elongate, thickened, distinctly prominent along the costal edge; apex obtusely pointed, termen long, moderately curved, oblique. Whitish, irrorated with pale fuscous and pale grey. Markings formed by fine transverse fuscous strigulation slightly spotted with ochreous here and there, and marked with dark fuscous. Base of wing white; basal patch on costa beyond  $\frac{1}{4}$ , on dorsum beyond  $\frac{1}{3}$ , with posterior edge little oblique, concave from costa to fold, with a small pointed projection just below fold, sinuate thence; this patch formed by fine fuscous-grey transverse irroration, coarsely irrorated with blackish-fuscous on the basal fourth, similar irroration forming a strigula in the middle of the patch and narrowly edging posterior margin of the patch; this posterior margin dilated on costa, less dilated and slightly tinged ochreous below fold; space between basal patch and central fascia evenly irrorated with light grey except on costa and along posterior margin (which remain whitish), and marked along its middle by series of faint dark fuscous dots; central fascia rather broad above, considerably narrowed below; anterior edge of this fascia moderately rounded above, almost concave below, faintly marked with dark fuscous; fascia fuscous-ochreous, obscured by fuscous transverse strigulation; upper half of posterior margin broadly but irregularly edged with dark fuscous; tooth moderate, irregular, somewhat constricted at base; pterostigmal area suffused with grey, this colour limited posteriorly by the course of vein 10, confluent there with the first costal spot; stigma with a grey spot, preceded by two pairs of white strigulae; pretornal dorsal patch suffused, fuscous, triangular, an irregular fuscous strigula rising from tornus, top more or less connected with the tooth of the central fascia; terminal patch rather narrow, oblique, gently curved (inwards-concave) subclavate, top rounded; fuscous-ochreous, strigulated, and suffusedly and broadly edged with dark fuscous; second costal spot erect-triangular, vertical, reaching with top to vein 7; apical spot small, suffused ochreous, obscured with fuscous, semiovate. Cilia (damaged) greyish-tawny, becoming more tawny-tinged towards apex, grey in tornus, with a subbasal fascia, tawny around apex, fuscous along termen, interrupted well below apex.

Hind wing subtriangular, apex rounded, projecting, termen being slightly notched on vein 5, anal angle little prominent; vein 2 from much before  $\frac{2}{3}$ , 3 and 4 coincident, 3 + 4 and 5 straight, moderately diverging, separate, 6 and 7 connate. Semipellucent, tinged fuscous-yellowish with darker fuscous veins, apical third fuscous with darker fuscous veins. Cilia fuscous around

apex, becoming white along termen, white on dorsum; a fuscous subbasal shade around apex, abruptly attenuated along termen and obliterate before vein 2.

Holotype, ♂, East Java, Tengger Mountains, Southern slope of Mount Smeru, Ranu Darungan, 820 m, primary rain forest, 30.V.1941 (A. Diakonoff).

Type locality: East Java, Tengger Mountains, Ranu Darungan, 820 m.

Unfortunately the abdomen of the unique specimen is missing and the genitalia remain unknown. Although reluctantly, I still venture to describe this new species, as the male is easily recognizable by the peculiar neuration of the hind wing, with veins 3 and 4 coincident, as in *fetialis*, but with the shape of the wing being quite different; furthermore, the colouring of the single male, especially the white tegulae, is unusual. As in the present group of species of *Lobesia* there is hardly any sexual dimorphism with regard to the colouring, there is every reason to expect that in the (unknown) female it will be similar, and that attribution of the female after its discovery to its sex-partner will give no difficulties.

Judging from the neuration of the hind wing the present species is nearest to *fetialis*. Therefore I attribute it to the same subgenus.

***Lobesia (Lomaschiza) rhombophora* spec. nov.** (text figs. 8, 14)

ῥομβος = lozenge, φέρω = to bear

"*Lobesia* sp. nov.", Diakonoff, 1950, Bull. Brit. Mus., Ent., vol. 1, p. 293, pl. 3 f. 8 (gen. ♂; Java, Buitenzorg, bred from *Sesamum indicum*).

♂ 9-11 mm. Head pale tawny, tufts on vertex slightly darker, sometimes touched with pale fuscous. Antenna light fuscous, ringed with dark fuscous, scape pale tawny. Palpus broad, short, terminal segment almost concealed in the apical tuft of the median segment; basal segment pale ochreous; median segment pale ochreous, except extreme base and dorsal portion of tuft at apex, suffused with light tawny and speckled with dark brown, more so posteriorly; terminal segment (only tip showing) dark brown. Thorax pale ochreous-tawny, touched with fuscous, irrorated with light brown, which colour forms a pair of ill-defined rounded spots in middle; posterior crest light brown; tegula with a median band and an apical patch of that colour; shoulder clouded with brownish. Abdomen ochreous-fuscous, venter whitish towards the base. Abdominal scent organ with oval pouches, strong, somewhat narrower than in *fetialis*, scales ovoid, black. Legs, anterior and median femur whitish suffused with light tawny-fuscous, anterior and median tibiae more suffused with the same colour, with knee, and a submedian transverse band, ochreous-whitish; anterior and median tarsi dark brown above,

on articulations ringed with whitish; posterior leg whitish clouded with pale tawny, tarsus exteriorly suffused with fuscous, except pale rings on articulations of segments; a fringe of fine white hairs on the femur below, a pencil of long white hairs on inner side of tibia, reaching to its top, posteriorly concealed in a furrow, formed by the hairs of the inner surface of tibia.

Fore wing elongate-ovate, moderately broad, but broader than in *fetialis* ♂; costa almost straight anteriorly, gently convex before apex, pterostigma distinct, prominent, elongate (less conspicuous and narrower than in *fetialis* ♂), with costal edge distinctly prominent, apex rounded, termen gradually rounded, rather oblique; dorsum slightly rounded-prominent at its basal third, the base of wing being rather abruptly narrowed. Whitish-ochreous, slightly clouded with pale fuscous, markings light tawny-brownish or ochreous-tawny, irrorated and marked with dark fuscous-brown. Basal patch large, on costa reaching beyond  $\frac{1}{4}$ , on dorsum beyond  $\frac{2}{5}$ , with posterior edge bluntly angulate below middle, gently convex above and below this prominence; rather deep fuscous-tawny, with some five dark brown points along costa, first and ultimate point continued by an interrupted dark brown irroration to dorsum, first strigula oblique, second angulate and tolerably parallel to posterior edge of the basal patch; centre of the patch between these strigulae, and from below costa to above dorsum, occupied by a rounded pale fuscous patch, ill-defined, but mostly paler than the remainder of basal patch, centred with dark fuscous-brown irroration; a similar irroration obscuring the basal patch on dorsum. Space between basal patch and central fascia of pale ground colour faintly clouded with light tawny, with three dark points along the costa, the median of these largest, connected by a narrow brownish rather well-defined line with dorsum; central fascia rather narrow, anterior edge tolerably straight, slightly outwardly oblique, sometimes median portion gently convex, always with a small dentoid prominence on the upper edge of the cell, pointing slightly upwards; posterior edge with the usual hook, curved upwards, in the middle or slightly below the middle of the wing; rather deep tawny-brownish, posterior margin along upper part irrorated with dark brown, along lower part this edge with a few dark scales only; pterostigma with a narrow and a broad dark greyish-fuscous transverse band, the latter preceded and followed by a minute transverse line; below pterostigma a moderate, greyish suffusion; subtornal patch on dorsum moderate, dissolved into some three irregular markings, brownish, connected by a narrow outwardly convex line with a brownish small spot below the posterior extremity of the pterostigma; terminal patch erect-semicircular, with suf-

used, sometimes excavated anterior edge, light tawny, with posterior edge marked with a few minute vertical blackish dashes; two rather large subquadrate fuscous-tawny dots on costa between pterostigma and apex; apical patch small, posteriorly edged with a minute whitish line, making its shape obliquely-oval; tawny, centred with a small dark brown dash; a few irregular small dark brown transverse dashes and dots on and before termen below the apical patch. Cilia whitish clouded with fuscous-tawny; an interrupted tawny basal fascia; a narrower postmedian line; tips darker tawny, tips of costal cilia above apex dark brown.

Hind wing acutely triangular, with apex moderately rounded and rather prominent, termen being rounded as far as vein 5, concave there, thence gently scalloped in an irregular way (below vein 3, on vein 1c), anal angle rounded and rather prominent; veins 6 and 7 gradually approximated towards base, rather abruptly approximated at the very base, their bases still distinctly separated; vein 5 short, curved throughout, approximated at the base to 4, 3 and 4 still shorter, connate, 2 moderately short. Semipellucent, hairy, whitish-ochreous at the base, opaque parts opalescent, and covered with fuscous-tawny scales, these parts being the apical third of the wing, and an ill-defined, abruptly narrowed terminal band to vein 1b, obscurely extended along the course of this vein. Cilia pale tawny with golden gloss, a fuscous-tawny subbasal line, anal cilia unicolourous glossy snow-white.

Male genitalia (text fig. 14). Tegumen with top slightly narrower than in *fetialis*, rounded. Socius represented by longitudinal series of small hairs. Gnathos large, arms membraneous, weak, median portion submembraneous, gradually thickened towards its middle, and with a broad median truncate upward projection; this median portion covered with longitudinal verrucose wrinkles, except along a narrow median furrow (showing that this projection is of paired origin), and at the extreme sides. Valva long, cucullus somewhat less narrow than in *fetialis*, cucullus bristles short and thick; sacculus with Spc<sub>1</sub> oval, Spc<sub>2</sub> forming a small marginal group of spines and one or two more medially arranged spines; Spc<sub>1</sub> and Spc<sub>2</sub> completely separated by the secondary incision, which bears a single spine at its bottom, vinculum broader but less prominent than in *fetialis*, caulis very long. Aedoeagus straight, with rounded base. Cornuti, a group of spines, arranged tile-wise. (Slide figured: 1390).

♀ 9-13 mm (a dwarfish specimen 7.5 mm). Head and thorax somewhat deeper ochreous-tawny, thorax with a faint anterior band, a postmedian transverse brownish band, and a narrow irregular faint transverse series of interconnected fuscous dots. Palpus with terminal segment less concealed, pale ochreous mixed with dark brown, finely tipped white. Abdomen rather

dark greyish-fuscous, dull posterior edges of segments paler, glossy; venter whitish-fuscous.

Fore wing broadly ovate, broader than in male. Costa tolerably straight to before apex, pterostigma indicated by a slight corrugation of the costa at that place only, edge of costa not prominent; apex more rounded, termen more rounded, less oblique than in male. Variably tinged, mostly darker than male, brownish tinge being more extended, especially the central fascia being conspicuously tawny-brown or dark brown. Basal patch with posterior edge less angulate, more gradually rounded in the middle, but still distinctly concave towards costa and dorsum; central fascia of slightly variable shape, somewhat broader than in male, with anterior edge always slightly notched below costa, notch followed by a small triangular projection, mostly more distinct than in the male; tooth in the middle of posterior edge of this fascia either acute or rather blunt, edge above the tooth more or less oblique, always gently convex; subapical costal spots more triangularly shaped; apical spot not divided below posteriorly by a pale line from wing margin; subternal dorsal patch in most specimens cloudy, triangular, its narrow connection with the spot below the pterostigma often obliterate except the discal part. Cilia tinged deeper tawny-fuscous, parting lines more distinct, basal line deep brown. In a few pale specimens from Buitenzorg, West Java, the tawny and brownish colour of the markings in the fore wing more or less olive tinged.

Hind wing normal, elongate-triangular, with termen gently notched opposite vein 5. Rather dark fuscous-brown, deeper along marginal fourth, paler towards the base. Cilia glossy fuscous-brownish, becoming whitish-fuscous along lower part of termen and along dorsum, throughout with pale base and a narrow brownish subbasal shade.

Female genitalia (text fig. 8). Colliculum broadly tubular, dilated along its lower fourth, ventral portion of upper rim (anterior rim in figure) rounded. Signum absent. (Slide figured: 1423).

#### Material studied.

Holotype, ♂, allotype, ♀. East Java, Pasuruan, 5 m, bred from larvae spinning leaves of *Pluchea indica* (Compositae), 22.IX.1940 (A. Diakonoff) (genit. slides ♂ 1390, ♀ 1402).

Paratypes, West Java, Buitenzorg, 250 m, on lamp, 26.VIII.1948, 1 ♀ (genit. slide 1410); 13.III.1949, 1 ♀; 27.VII.1950, 1 ♀ (genit. slide 1403) (P. C. Drescher). 16.IX, 6, 29.X.1949, 3 ♀; 18.XII.1949, 1 ♀ (genit. slide 1409) (E. J. Beeltje). Bred from larvae on *Sesamum indicum* (Pedaliaceae), VI.1929, no. 24, no. 6, 1 ♂ (genit. slide 1429) 1 ♀ (genit. slide 1430) (R. Awibowo). Bred from larvae on leaves of *Perilla* (Labiatae)

VII.1940, no. 3148, 2 ♀ (genit. slide 1489) (C. Franssen). Central Java, Semarang, Telawa, 40 m, teak forest, bred from larvae on leaves of *Sesamum indicum*, 13.VII.1933, no. 459, 1 ♀; 3.XII.1934, no. 859, 1 ♀; 16.XII.1934, no. 959, 1 ♂ (genit. slide 1425); idem, 1 ♀ (genit. slide 1426); 19.XII.1934, no. 959, 1 ♀ (L. G. E. Kalshoven). Telawa, teak forest, bred from larvae in young fruits of *Bridelia stipularis* (Euphorbiaceae), 14.VI.1931, no. 528, 1 ♀ (genit. slide 1490) (L. G. E. Kalshoven). Semarang, Seneng, bred from larvae on leaves of *Sesamum indicum*, 5.XII.1931, no. 646, 1 ♀ (L. G. E. Kalshoven). Bred from larvae on leaves of ? *Blumea balsamifera* (Compositae), 3.VIII.1931, no. 650, 1 ♂ (genit. slide 1483); 3.VIII.1931, 1 ♂ (genit. slide 1487) (L. G. E. Kalshoven). Sampung (near Ponorogo, South of Madiun), larva on leaves of a Composite plant, 26.VII.1943, 1 ♀ (genit. slide 1659) (Djakiman). East Java, Pasuruan, 5 m, 22.IX.1940, bred from larvae spinning leaves of *Pluchea indica* (Compositae), 2 ♂, 1 ♀ (A. Diakonoff). The same locality and collector, 22.IX.1940, 1 ♀ (genit. slide 1408). Winongan near Probolinggo, 5 m, bred from larvae on leaves or in flower heads of an unidentified composite plant, 12.IX.1940, 2 ♂, 5 ♀ (A. Diakonoff).

Type locality: East Java, Pasuruan, 5 m.

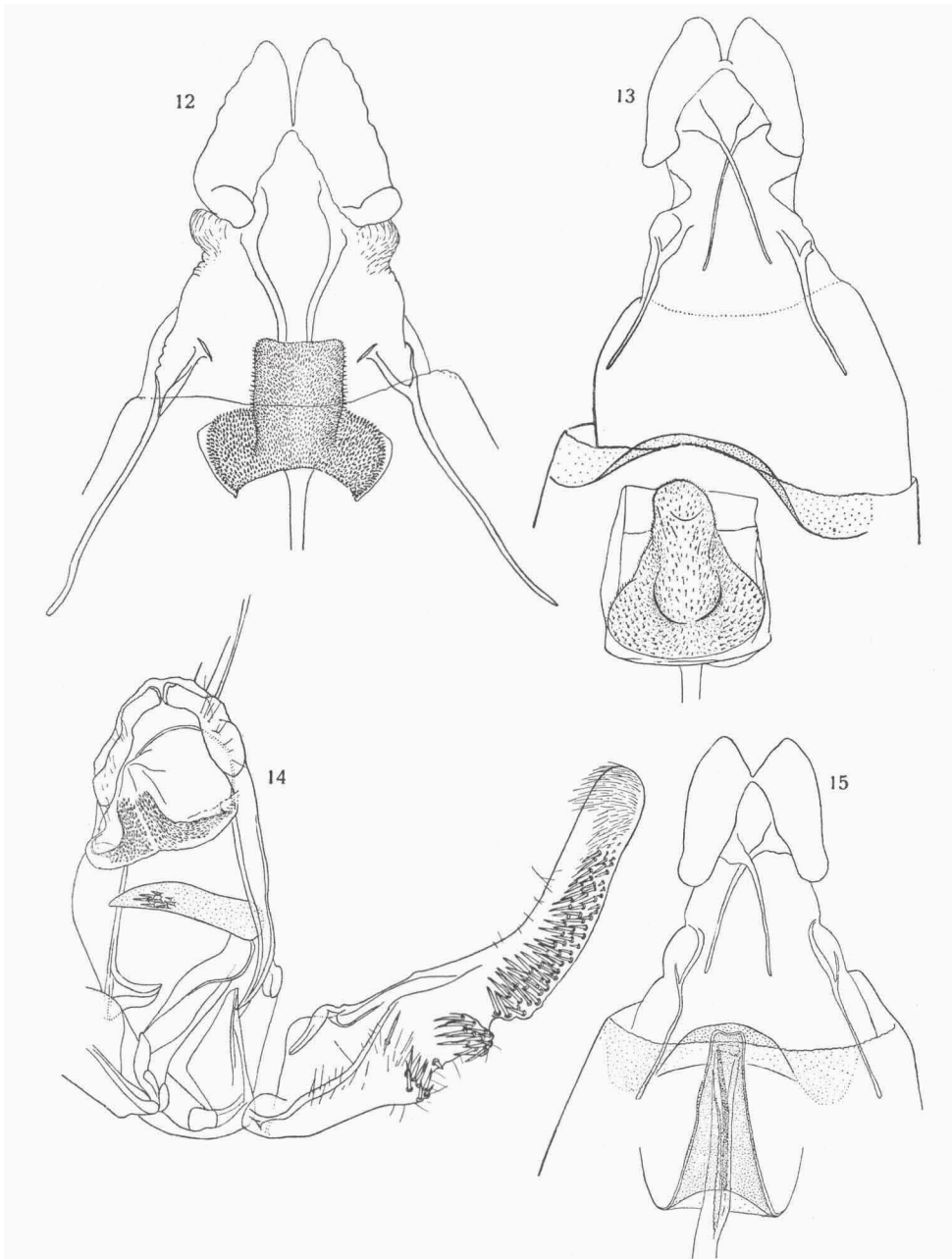
The material from the Institute for Plant Diseases and Pests (collected by Kalshoven, Franssen, and Awibowo) has been identified by Meyrick and placed under the names *Lobesia aeolopa* Meyr., *L. fetialis* Meyr., or *L. sitophaga* Meyr.

Both sexes vary considerably, but are mostly recognizable without difficulty by the central fascia which is conspicuously darker than all other markings, being tinged dark brown throughout, and not with the posterior edge from costa to the middle dark only, as is the case in the most other species.

***Lobesia (Lomaschiza) relict*** spec. nov. (text fig. 12)

♀ 15 mm. Head with face tawny-whitish, vertex somewhat deeper tawny, tufts on vertex still deeper brownish-tawny, in the middle suffused with dark brown. Antenna pale tawny ringed with dark brown. Palpus moderate, basal segment bushy, whitish-tawny; median rather broad, flattened laterally (longer than in the preceding species), light tawny, along the upper edge irrorated with dark brown, along the lower edge, especially towards apex, suffused with greyish-fuscous; apex, and tuft at the apex above, whitish-tawny; terminal segment (longer and not concealed, as in the preceding species), thick, truncate, light tawny, tip tawny-whitish. Thorax tawny, slightly clouded with brown, posterior tuft brownish; a faint, rather narrow antemedian fuscous transverse band, and a similar median band, both





Figs. 12-15. Genitalia of *Lobesia*. 12, *Lobesia (Lomaschiza) relicta* spec. nov., ♀; 13, *L. (Lomaschiza) montana* spec. nov., ♀; 14, *L. (Lomaschiza) rhombophora* spec. nov., ♂; 15, *L. (Lobesia) aeolopa* Meyr., ♀.

extending over tegulae, each followed by a similar whitish-ochreous band. Legs pale ochreous, anterior and median femora suffused with dark brown in the middle, anterior and median tibiae with a similar suffusion throughout except on knee, with a submedian and an apical pale ochreous ring, tarsi similarly suffused, articulations of segments with whitish rings; posterior tarsus slightly infuscated above except on articulations of segments. Abdomen rather dark fuscous, venter whitish-ochreous, with the eighth sternite fuscous.

Fore wing elongate-ovate, somewhat broader than in *fetialis*, costa gently convex beyond the base, equally concave at one-third, distinctly prominent around pterostigma, almost straight beyond this; apex rounded, termen moderately rounded, rather oblique, pterostigma slightly prominent on upper side of wing, limited below by a shallow furrow. Whitish-ochreous. Markings deep tawny, marked with dark fuscous-brown; on and between the markings a leaden-grey irroration mixed with dark fuscous-brown. Basal patch reaching on costa to slightly beyond  $\frac{1}{4}$ , on dorsum to  $\frac{1}{3}$ , with the edge gradually rounded, slightly dentate; deep tawny with the central third (on costal fourth of patch) paler, ochreous-fuscous, on dorsal three-fourths of patch densely irrorated with leaden-grey, and dilated; posterior edge of this leaden-grey irroration strongly serrate, with a dentation above the fold reaching to posterior edge of the basal patch; basal patch transversely strigulated with more or less irregular dark fuscous-brown lines, forming indistinct dark edges to pale central area and along the posterior margin of basal patch; four oblique strigulae on costa, the ultimate pair filled with tawny-fuscous; space between the basal patch and the central fascia constricted on vein II, gradually dilated thence to dorsum, with three dark dashes on costa, the median dash largest; below constriction filled with leaden-grey, except a narrow anterior edge of pale ground colour not reaching dorsum, and a broader similar posterior edge well reaching dorsal edge of wing; central fascia deep tawny-brownish, upper half of posterior edge and tooth edged with an irregular dark fuscous-brown streak, on costa preceded by a minute short dark line; anterior edge of central fascia with a triangular small projection below costa; pterostigma with an oblique-oval dark fuscous spot preceded by a narrow tawny line, extending below posterior extremity of pterostigma into an oval tawny spot, traversed by a longitudinal dark brown line; subternal dorsal patch well-defined, dark brown, connected by a dark brown line with substigmal spot; ground colour between the central fascia and the terminal patch suffused with pale leaden, except on the edges of markings; terminal patch large, light tawny, gently clouded with fuscous, obliquely erect-oval, with obliquely truncate top;

an elongate, and a larger, triangular tawny-fuscous spot on costa before apex; triangular spot connected by a dark brown line with a smaller irregular dark brown triangular mark on termen below apex; apical patch narrowly edged below posteriorly with whitish, clouded in the middle anteriorly with fuscous. Cilia tawny with a broad basal and a faint antemedian brown line, two broad whitish-ochreous bars from bases to tips below apex, interrupting the basal line; cilia in tornus fuscous.

Hind wing subtrapezoid, fuscous, becoming paler on basal  $\frac{2}{3}$ , costa whitish, apex with a deeper fuscous suffusion. Cilia somewhat duller greyish-fuscous, with pale base and a faint fuscous subbasal line. Veins 6 and 7 converging, abruptly and closely approximated at the base; 5 approximated at the base, 3 and 4 separated, 2 from beyond  $\frac{2}{3}$ .

Female genitalia (text fig. 12). Colliculum widely tubular, with a broad basal plate which is emarginate ventrally. Anapophyses long. Ninth segment with a lateral thickened pad just below each lobe of the ovipositor. (Slide figured: 1448).

Holotype, "West Java, Buitenzorg, 1894, ♀, 7555", "origin. afb.", "*Grapholitha anderreggana* Guenée, det. Sn." (in Snellen's hand). "M 75" (in Meyrick's hand). From the Snellen Collection in the Leiden Museum. One specimen.

Type locality: West Java, Buitenzorg, 250 m.

This species is closely allied to *fetialis* and very similar to it, except for the genitalia differing only in size, in the first band of the ground colour in the fore wing being constricted below costa, and in the greater extension of the leaden-grey irroration across the lower basal part of the wing; however, these differences from *fetialis* are of little value as long as the variation of the present species remains unknown. The genitalia are quite distinct.

Possibly the present species is a relict of the fauna of Buitenzorg in the nineties; great changes of the flora and fauna must have taken place since and *relicta* may have become extinct in that neighbourhood and have retreated to the still remaining mountain forests farther up; however, vigorous collecting at the slopes of Mount Gedé of recent years did not provide a single additional specimen of this species, but those of the little related *montana* sp. nov.

***Lobesia (Lomaschiza) montana* spec. nov.** (text fig. 13)

♀ 12.5-13 mm (type 12.5 mm). Head sordid pale tawny-ochreous. Antenna tawny, finely ringed with light brown. Palpus moderate, with basal segment whitish-ochreous; median segment narrow at the base, triangularly

dilated, pale tawny, posterior half and apical tufts throughout suffused with dark brown; terminal segment exposed, moderate, with obtuse tip, light tawny. Thorax light tawny, coarsely irrorated with brown throughout, with a faint anterior transverse band of brownish suffusion, posterior tuft brownish with pale tips of scales, little darker than the thorax. Abdomen fuscous-black, vertex pale ochreous, becoming irrorated with dark fuscous towards apex, except the posterior edges of the segments. Legs pale tawny, rather strongly suffused with dark brown, median tibia paler towards the knee in the middle and at the apex, tarsi dark brown with pale ochreous rings around articulations of segments, posterior tarsus faintly greyish in the middle of the segments.

Fore wing elongate-ovate, rather narrow; costa hardly curved just beyond base, straight in the middle, gently convex along apical fourth; pterostigma distinctly raised upon surface of wing but not projecting on costal edge, elongate, limited below by a fine furrow; apex rather pointed, termen little rounded, oblique. Whitish-ochreous, partially irrorated with fuscous-grey and slightly suffused with fuscous; markings tawny with some edges narrowly ochreous, marked with dark brown strigulae and irroration. Basal patch small, not reaching one-fourth of costa, ill-defined, indicated by its rounded posterior edge, this edge is broad on costa, abruptly narrowed downward, interrupted above and below the middle, and reduced to a series of dark brown scales on dorsum; on costa and in the middle this edge is brownish-tawny, mixed with ochreous and irrorated with dark brown; basal third of patch indicated by a fuscous-grey suffusion, irrorated with dark fuscous, with posterior edge rather straight, oblique; central portion of basal patch formed by an ill-defined, somewhat oblique transverse fascia of pale ground colour, irrorated and transversely strigulated in the middle and below with brownish and dark fuscous; space between basal patch and central fascia hardly dilated below, gently sinuate, suffused with pale fuscous, in the middle with two to three irregular series of brown scales from costa to dorsum; lower half of this space below the fold suffused with dark fuscous-grey, speckled with dark fuscous; a few dark points on costa; central fascia irregular, upper part narrow, tooth long, curved upward, anterior edge hardly incised below costa, below the middle becoming suffused; posterior edge well-defined, gradually concave along upper half, below the tooth becoming suffused and irregularly serrate; central fascia deep fuscous-tawny above, becoming pale tawny-ochreous below fold; triangularly narrowed, and almost obliterate towards the dorsum; on the costa this fascia suffused with dark fuscous, its posterior edge hardly irrorated with that colour; a longitudinal irregular dark fuscous streak across fascia,

above its middle extended along upper edge of tooth to its apex; pterostigma with a subtriangular dark fuscous spot, preceded and followed by a small dark costal mark, each of these edged on both sides with pale ochreous; a light grey suffusion below pterostigma, traversed by an irregular narrow dark fuscous streak, spot below posterior extremity of stigma tawny, confluent with first costal spot beyond stigma; pretornal dorsal patch extended, formed by a rounded-erect tawny spot, bordered at the sides by the ground colour, furthermore by a narrow line of dark fuscous irroration suffused with leaden-grey; these lines converge above pretornal patch and continue as a single, well-defined dark line to below substigmal spot, thence zigzagging towards preapical costal dot, but not reaching it; terminal patch large, rounded-oval, top connected by a narrow strigula with the costa between the costal spots, median portion and posterior edge of patch with vertical dark fuscous strigulae; subapical costal dot large, obliquely-triangular; apical spot round; fine dark strigulae running between apical and costal spots and forming a small  $\perp$ -shaped mark on termen below apex. Cilia pale tawny, opposite the middle of termen suffused with deeper tawny, above this suffusion with two faint pale bars, on costa suffused with dark fuscous-brown, on dorsum fuscous; a fulvous-tawny basal line.

Hind wing rather narrow, elongate-subtrapezoid; dark bronze-brown, becoming somewhat paler towards the base, semitransparent at base; cilia rather dark grey-fuscous, glossy, with a brown subbasal shade and pale base. Veins 6 and 7 short-stalked (holotype) or closely approximated towards base (paratype); 5 closely approximated at base; 3 and 4 connate, 2 from  $\frac{2}{3}$  of the lower edge of the cell.

Female genitalia (text fig. 13). Limen narrow, broadly curved in middle, laterally forming a short, broad band. Colliculum pear-shaped, with rounded top and broad base, bearing the funnel-shaped ostium on its ventral surface. Ductus bursae narrow. Anapophyses short. (Slide figured: 1404, holotype).

Holotype, ♀, West Java, Mount Gedé-Pangerango, Tjibodas, 1400 m, IX.1949 (A. M. Neervoort, on lamp light). Paratype, ♀, same locality and collector X.1949. 2 specimens.

Type locality: West Java, Mount Gedé-Pangerango, Tjibodas, 1400 m.

Darkly coloured abdomen and hind wings characterise this species. The markings of the fore wing are characteristic by the obliteration of the central fascia towards dorsum.

I attribute the present species to the subgenus *Lomaschiza*, the colliculum being aciculate. However, a distinctly developed limen is present, linking *montana* with the species of the following subgenus, *Lobesia* s. str. The genitalia of the male—so far unknown—would show its true affinity.

**Lobesia (Lomaschiza) ultima** spec. nov. (text fig. 10)

♀ 10-11 mm. Head whitish-ochreous, side tufts on vertex pale tawny mixed with fuscous. Antenna whitish-ochreous ringed with dark fuscous. Palpus whitish-ochreous, externally mixed with a few dark fuscous scales. Thorax pale ochreous, infuscated, along lateral margins and on apical third suffused with dark fuscous; tegula with anterior half fuscous, posterior half pale ochreous mixed across its middle with dark fuscous scales. Legs whitish-ochreous, partially suffused with pale tawny, on middle of segments above mixed with a few dark fuscous scales, posterior tarsus above dark fuscous except on articulations of segments. Abdomen dark fuscous-grey, becoming blackish posteriorly, venter whitish-ochreous, becoming whitish towards base, with apical segment black.

Fore wing elongate, moderately broad, costa tolerably straight or faintly concave to beyond middle, distinctly prominent along pterostigma, gently curved posteriorly, pterostigma thickened, limited below by a fine furrow; apex rounded; termen rather straight, moderately oblique. Ground colour glossy greyish-ochreous-white, on apical third and along costa distinctly suffused with light tawny. Markings rather well-defined. Basal patch in middle of disc reaching to  $\frac{1}{3}$  of wing length, with outer edge bluntly angulate in fold; central portion of patch greyish with two ill-defined transverse strigulae of dark fuscous-grey irroration; anterior and posterior margins of the basal patch marked with a dark fuscous striga, each narrowly edged anteriorly with light ochreous; area of ground colour beyond the basal patch irrorated on its upper portion with greyish and dark fuscous; median fascia well-defined, unicolorous deep coffee-brown, faintly edged with pale ochreous; anterior edge of fascia slightly outwards-oblique, with a small rounded prominence above cell; posterior edge of fascia above tooth considerably oblique, tooth rather short, slightly directed upward, but not curved, edge below tooth rather straight; terminal patch conspicuous, dark fuscous suffused with tawny-brown, triangular, well-defined except its (horizontal) lower edge which is marked with four minute transverse dark fuscous strigulae; apical patch tawny-brown, suffused anteriorly with fuscous, preceded by a suffused brown costal dot; an interrupted transverse stria of fuscous irroration, forming two longitudinal dark marks, viz., on lower part of pterostigma posteriorly, and below it, and a few longitudinal marks below vein 9, more or less connected by a line with dorsum before tornus; a few dark strigulae between markings; a suffused light ochreous-tawny streak along vein 9. Cilia fuscous-tawny, brighter tawny along base, becoming pale ochreous in tornus; with a fine pale antemedian line.

Hind wing with vein 2 from beyond  $\frac{2}{3}$ , 3 and 4 connate, 5 approximated,

6 and 7 stalked. Subhyaline, marginal third being irrorated with greyish-fuscous scales, this irroration extending along the veins almost to base of wing; hyaline areas more or less densely covered with greyish-fuscous fine hairs. Cilia greyish-fuscous, with a pale basal, and a grey subbasal line.

Female genitalia (text fig. 10). Ostium + colliculum, a broad, shallow cup, with wrinkled, aciculate walls. (Slide figured: 1524 D, holotype).

Holotype, ♀, West Java, Buitenzorg, 250 m, 19.VII.1949 (A. Diakonoff).

Paratype ♀, the same locality, 21.XI.1948 (E. J. Beeltje).

Judging from the genitalia this species may be nearest related to *montana* sp. nov. As far as can be judged from the limited material it is distinct by the dark and well-defined median fascia, and by the pretornal patch, which is triangular and not rounded, as in the allied species. *L. (L.) ultima* seems to be another link between the subgenera *Lomaschiza* and *Lobesia*.

#### Subgenus **Polychrosis** Ragonot, 1892

*Chrosis* Heinemann, 1863, partim, Schmett. Deutschl., vol. 1, part 1, p. 135 (nec *Chrosis* Guenée, 1845); praecoccupied.

Subgenus *Polychrosis*, Obraztsov, 1953, Tijdschr. Entom., vol. 96, p. 92.

Tegumen flattened. Gnathos, a membraneous transverse plate. Valva with curved cucullus, neither clavate nor narrowed, densely bristled; sacculus simple, Spc<sub>2</sub> present, Spc<sub>1</sub> absent. Fore wing with vein 10 approximated at base to 9, 11 remote, sinuate.

Contains two palaeartic species, *vitisana* Jacquin (= *botrana* Schiffner, teste Paclt, Entom. Ber., vol. 14, p. 379, 1953) (pl. III fig. 6), and an apparently new and undescribed species from South Europe.

#### Subgenus **Lobesia** Guenée, 1845

*Lobesia* Heinemann, 1863, partim, Schmett. Deutschl., vol. 1, part 1, p. 137 (division of *Grapholitha* Hb.).

*Byrsoptera* Lower, 1901, Trans. Roy. Soc. S. Austral., vol. 25, p. 68.

Subgenus *Lobesia*, Obraztsov, 1953, Tijdschr. Entom., vol. 96, p. 89.

Gnathos membraneous, mostly with a median rising process connected with the anus. Valva with curved cucullus, more or less clavate, or not clavate, but not narrowed, densely bristled; sacculus usually simple, seldom gently scalloped, Spc<sub>2</sub> present, Spc<sub>1</sub> mostly present, either separated from Spc<sub>2</sub> or (more or less closely) united with Spc<sub>2</sub>. Fore wing with neuration of the *reliquana* type or with veins 9-11 tolerably equidistant and only vein 11 strongly sinuate; hind wing in male normal or with pointed apex. Indo-Australian species with the colliculum + ostium naked, tubular, and with a limen. Male usually with a tibial pencil.

Numerous palaeartic and tropical South Asiatic species representing several types, that are connected by intermediate forms, so that a supraspe-

cific division is not practicable. The *reliquana* type with a hardly clavate cucullus and Spc<sub>1</sub> connected ventrally with Spc<sub>2</sub> passes into the *littoralis* type with a well-clavate cucullus and the small Spc<sub>2</sub>, situated well-isolated and basad (*ambigua*) or slightly distad (an undescribed species from Sumba) of Spc<sub>1</sub>; sometimes this small Spc<sub>2</sub> may be reduced to a couple of spines. The apomorph species with a valva approaching that of the *Polychrosis* type.

#### Palearctic species of the subgenus *Lobesia*

It may be stipulated that to the subgenus *Lobesia* I attribute the following palearctic species, the male genitalia of which I had the opportunity to study. They are arranged according to the situation of Spc<sub>1</sub> and Spc<sub>2</sub>, *littoralis* being, in my opinion, the most apomorph species with Spc<sub>1</sub> and Spc<sub>2</sub> entirely united, *cinerariae* the most plesiomorph, with Spc<sub>1</sub> and Spc<sub>2</sub> entirely separated. The cucullus in the first five species is distinctly clavate, in *reliquana* and *cinerariae* less distinctly so.

- Lobesia* (*Lobesia*) *littoralis* (Westwood, 1831)
- Lobesia* (*Lobesia*) *artemisiana* (Zeller, 1847)
- Lobesia* (*Lobesia*) *fuligana* (Haworth, 1811) (text fig. 3)
- Lobesia* (*Lobesia*) *porrectana* (Zeller, 1847)
- Lobesia* (*Lobesia*) *indusiana* (Zeller, 1847) (text fig. 4)
- Lobesia* (*Lobesia*) *bicinctana* (Duponchel, 1844)
- Lobesia* (*Lobesia*) *reliquana* (Hübner, 1796-1799) (pl. III fig. 6)
- Lobesia* (*Lobesia*) *cinerariae* (Nolcken, 1882)

The tropical species are discussed below.

#### ***Lobesia* (*Lobesia*) *ambigua* spec. nov.** (text figs. 9, 11)

*Lobesia proterandra* Diakonoff, 1950 (nec Meyrick, 1921), Bull. Brit. Mus., Ent., vol. 1, p. 292 (descr. genit. ♂, from material of Shillong, Assam, and genit. ♀, from Java), pl. 3 fig. 7, pl. 4 fig. 11<sup>1</sup>).

♂ 9-13 mm (holotype 11 mm). Head tawny, face whitish, apices of tufts on vertex with a median dark shadow. Antenna tawny-ochreous ringed with brown. Palpus triangularly dilated; orange-tawny, basal segment whitish-ochreous, median segment irrorated with dark brown, this irroration becoming denser posteriorly, so as to form an oblique subapical transverse band; terminal tuft short, obtuse, bright tawny, pale-tipped. Thorax light tawny, a broad anterior band, and two transverse submedian lateral spots brown, tegula with a basal spot and a median moderate band brown, posterior crest irrorated with brown. Legs ochreous-tawny, suffused in the usual way with brown; posterior tibia whitish-ochreous, suffused with pale

1) Cf. discussion of *L. (L.) proterandra* Meyr. below.



grey along apical half above; pencil of tibia long, dense, appressed to the inner side of tibia, white. Abdomen dark fuscous-grey, anal tuft pale ochreous, venter whitish-ochreous with anterior halves of segments clouded with greyish. Abdominal pouch large, elongate, very densely filled with yellowish scales.

Fore wings elongate-ovate, dilated, of variable width (sometimes distinctly narrower, as in holotype); costa gently convex beyond base, straight thence, strongly corrugated but only gently prominent on pterostigma, slightly curved before apex, apex moderately rounded, termen hardly rounded, oblique. Pale ochreous (in faded specimens whitish-yellowish) slightly irrorated with light brown. Markings brownish-tawny upon yellowish ground, this colour showing along anterior margins of central fascia and terminal patch. Basal patch large, to before  $\frac{1}{3}$ , with the posterior edge rounded-angulate, angulation often ill-defined, in the middle of that edge; this patch brownish-tawny, touched with yellowish, with some three interrupted irregular dark brown transverse strigulae, each dilated below the middle, so as to form an irregular small dark mark, central third of the basal patch formed by the ground colour, paler than other parts of the patch, but somewhat darker than the ground colour elsewhere; this central paler part running from costa to dorsum and reaching posterior edge of basal patch; thus this patch is divided in a basal tawny spot and a posterior third that is fasciate, slightly narrowed downward and broadly interrupted above the middle, as indicated above; some five dark brown dots on basal patch along costa; space between basal patch and central fascia rather slender, moderately dilated above, parted by some dark brown irroration, about lower  $\frac{2}{3}$  occupied by lilac-grey irroration, becoming dark and dense on dorsum, so as to form an erect-triangular spot, transversely strigulated with dark brown, posteriorly separated from central fascia by the pale ground colour; central fascia broad, with anterior edge tolerably vertical, gently concave or straight, with a small bluntly triangular projection below costa; posterior tooth of this fascia large, in the middle of wing; concavity of the posterior margin of central fascia edged with dark brown, mostly with two small notches, above and below its middle; lower half of anterior edge well-defined, base of fascia on dorsum broad; costal extremity of this fascia dark fuscous, followed by a transverse blackish jot on the costa, edged on either side by a minute similar mark; spot on pterostigma large, blackish-tussock, obliquely-triangular; area below pterostigma slightly infuscated, a tawny subtriangular dot below its extremity connected anteriorly with the central fascia by a longitudinal tawny streak and posteriorly with the first costal dot by an upturned line; subternal dorsal spot erect-triangular,



Figs. 16-19. Genitalia of *Lobesia*. 16, *Lobesia (Lomaschiza) fetialis* Meyr., ♀; 17, *L. (Lomaschiza) physophora* (Low.), ♀; 18, *L. (Lomaschiza) fetialis* Meyr., ♂; 19, *L. (Lomaschiza) physophora* (Low.), ♂.

on both sides flanked with blackish irregular strigulae converging above the top of the spot, continued as a single line to below the substigmal spot; two tawny costal spots beyond stigma, suffused on costal edge with blackish-fuscous, posterior spot subtriangular; from top of the last mentioned spot a brown line running to termen below apex, below top furcate and encircling spot on both sides; terminal patch large, erect-ovate or rounded (of variable shape) with submarginal dark brown strigulation along both sides; termen narrowly edged with dark brown, this edge interrupted above tornus and above base of terminal patch; apical spot large, brown, centred with blackish. Cilia light tawny-ochreous, with a broad subbasal fascia broadly interrupted twice below apex, obliterate towards tornus; cilia above apex suffused with lilac-blackish.

Hind wing subtriangular, little modified, apex moderately pointed, termen rounded, slightly concave above vein 5, rounded-prominent thence to vein 2. Vein 2 from beyond  $\frac{2}{3}$ , 3 and 4 long, separated and distant, little converging, 5 hardly approximated, distant, 6 and 7 very closely approximated, almost united towards base. Pale bronze fuscous, semipellucant, hairy, along marginal third opaque fuscous-bronze, becoming darker towards margins, especially towards apex; veins darker fuscous. Cilia light fuscous with pale base and darker subbasal shade.

Male genitalia (text fig. 11). Tegumen with a broad, flattened top, slightly projecting laterally. Socius, a moderate pad with bristles. Gnathos weak, broad at the sides, narrow in the middle, emargination of the lower edge rather irregular; a membraneous folded median projection, lying against the tube of the anus, is hardly traceable. Valva long; cucullus long, narrowed in the middle, with rounded and clavate top, and a broad base; sacculus broad and short;  $Spc_1$ , an elongate group of stout spines transversely crossing sacculus and extended marginally;  $Spc_2$ , two proximal spines placed separately (sometimes these spines absent). Aedoeagus long, slender, moderately curved. (Slide figured: 1391).

♀ 11-13.5 mm. Palpus broader. Thorax with posterior crest lighter brownish. Posterior leg pale ochreous throughout, tarsal segments blackish in the middle above. Abdomen rather dark fuscous with strong bronze gloss, venter whitish-fuscous, apical half irrorated with dark fuscous.

Fore wing mostly broader, but its width as variable as in the male. Markings congruent, except the following particulars: transverse fascia representing posterior third of basal patch sometimes not interrupted altogether, the dark brown strigula, marking posterior edge of basal patch, remaining intact; tawny spot below the posterior extremity of the pterostigma connected by a small tawny streak with the extremity of the tooth of the central

fascia; a small dark brown longitudinal streak below pterostigma; terminal patch sometimes connected by a small tawny streak with top of first costal spot (beyond pterostigma); subapical transverse strigula often leaden-grey instead of dark brown. In other respects similar to male.

Hind wing semiovate, of slightly varying shape: with more or less pointed apex; neuration as in male, vein 5 somewhat more approximated to 4 at the base, 3 and 4 less conspicuously distant, 2 from  $2\frac{2}{3}$ . Brownish-fuscous with darker veins, darker towards margin and in apex, paler fuscous-greyish towards the base. Cilia glossy greyish-fuscous, with a pale base, and a brownish subbasal shade.

Female genitalia (text fig. 9). Limen, a curved moderate band, lateral portions absent. Colliculum moderate, gradually dilated downward, with two apical processes. Signa absent. (Slide figured: 1413).

Holotype, ♂, East Java, Tengger Mountains, Nongkodjadjar, 1300 m, on lamp light, 25. XI. 1940 (A. M. R. Wegner) (genit. slide 1391).

Allotype, ♀, the same locality and collector, 18. XI. 1940 (genit. slide 1411).

Paratypes. West Java, Mount Gedé-Pangerango, Tjibodas, 1400 m, 5. VIII. 1951, 1 ♀ (genit. slide 1500) (Liem Swie Liong). Central Java, Magelang, 380 m, bred from larvae in fruits of mulberry, *Morus alba* (Moraceae), 29. VIII. 1936, no. 1302, 1 ♂ (C. Franssen), "*Lobesia aeolopa* Meyr., det. H. Stringer, 1938" (genit. slide 1482). East Java, Tengger Mountains, Nongkodjadjar, 1300 m, on lamp light, 8. V. 1940, 1 ♂; 26. VI. 1940, 1 ♂; 24 and 27. IX. 1940, 2 ♀; 29. X. 1940, 1 ♀ (genit. slide 1412); 10. XIII. 1940, 1 ♂; 24 and 27. IX. 1940, 2 ♀; 29. X. 1940, 1 ♀ (genit. slide 1412); 10. XII. 1940, 1 ♂; 28. XII. 1940, 1 ♂ (genit. slide 1398); 16. I. 1941, 1 ♂ (A. M. R. Wegner); Mount Tungangan near Nongkodjadjar, 1500 m, 5. XI. 1940, 1 ♀ (A. M. R. Wegner). Tengger Mountains, Tosari, 1750 m, bred from larva on leaves of *Crotalaria* sp. (Papilionaceae), 24. II. 1940, 1 ♂ (genit. slide 1397) (A. Diakonoff). Pasuruan, 5 m, in light trap, 7. III. 1941, 1 ♀ (genit. slide 1413) (A. Diakonoff).

Type locality: East Java, Tengger Mountains, Nongkodjadjar, 1300 m.

This larger, bright tawny species resembles *lithogonia* spec. nov. most. From *fetialis* and *rhombophora* it usually can be distinguished by the entire absence of any grey irroration in the basal patch. The male genitalia with a narrowed cucullus suggest a correlation with the subgenus *Lomaschiza*.

***Lobesia (Lobesia) aeolopa* Meyrick, 1907 (text figs. 15, 24)**

*Lobesia aeolopa* Meyrick, 1907, Journ. Bombay Nat. Hist. Soc., vol. 17, p. 976 (♂, ♀, Ceylon, Bombay). Exot. Microl., vol. 1, p. 565, 1916 (food-plant). Diakonoff, Bull. Brit.

Mus., Ent., vol. 1, p. 291, fig. 1 (neur. ♂), pl. 3 fig. 5 (genit. ♂), pl. 4 fig. 10 (genit. ♀), 1950 (lectotype, ♂, designated, from Maskeliya, Ceylon, other specimens recorded from South India, North Coorg, Bombay, Formosa; genit. ♂, ♀ described).

*Lobesia proterandra* Meyrick, 1921 (nec Diakonoff, 1950) Zool. Meded. Mus. Leiden, vol. 6, p. 155 (♂, ♀, East Java). Syn. nov.

*Lobesia dryopelta* Meyrick, 1932, Exot. Microl., vol. 4, p. 225 (♂, ♀, Central Java). Diakonoff (partim), Bull. Brit. Mus., Ent., vol. 1, p. 292, pl. 3 fig. 3 (genit. ♂), pl. 4 fig. 9 (genit. ♀) (lectotype, ♂, designated from Java; other specimens from West Java, and India, Coimbatore). Syn. nov.

*Lobesia (Lobesia) dryopelta*, Obraztsov, Tijdschr. Entom., vol. 96, p. 91, 1953.

Type locality: Central Java, Telawa near Semarang.

Distribution: India, Coimbatore; West Java, Buitenzorg; Central Java, Telawa.

After a recent reinvestigation of the types of *aeolopa* and *dryopelta* in the British Museum and of *proterandra* in the Leiden Museum, I am satisfied that they are conspecific.

Meyrick described "*Lobesia proterandra*" after one male and one female specimen, both from Mount Ardjuno in East Java (Hekmeyer leg., from the Snellen Collection in the Leiden Museum). The specimen bearing a red label "type" in the Leiden Museum is a female. As Meyrick states in his description that his "male" has the "hindwing normal, as in ♀", it is obvious that he had two females before him, one of which he mistook for a male. I was not able to locate the female cotype.

Meyrick's record of *aeolopa* from Africa (Proc. Zool. Soc. 1908, p. 716) is extremely dubious, and is therefore not cited above.

Unfortunately I had no opportunity to study the genitalia of the type specimen in Leiden in 1946 before I studied the material of *Lobesia* in the Meyrick collection in that year. Therefore I mistook the female specimen from Shillong in that collection and the specimen of the opposite sex from Java (from the collection of the Leiden Museum) for "*proterandra*" (Diakonoff, 1950, p. 292, pl. 3 fig. 7, pl. 4 fig. 11). Now I am satisfied that they belong to a new species (*ambigua*) described above.

♂ 10.5-12 mm. Head pale tawny, tufts on vertex with apical anterior half mixed with pale brown. Antenna pale tawny ringed with dark brown. Palpus moderate, rather broad, dilated, basal segment pale tawny; median segment light ochreous, finely irrorated with dark brown: at the base and along a broad cloudy transverse slightly oblique band before the apex; terminal segment light ochreous clouded with light brownish, whitish-tipped. Thorax light tawny marked with light brown; an anterior transverse band traversing the tegula before the base, two faint submedian lateral transverse marks, apical third of tegula and posterior crest light brown, with tips of scales pale tawny. Abdomen dark grey-fuscous, anal tuft pale

ochreous, venter whitish-ochreous, anterior halves of segments shaded with greyish. Abdominal pouches large, rather broad, oval, scales dense, yellowish. Legs, anterior and median leg pale ochreous, irrorated with brownish and dark brown, tibiae with two pale ochreous transverse bands, articulations of tarsal segments ringed with pale ochreous; posterior leg glossy fuscous-grey, femur along under side with a pecten of fine white hairs, tibia on inner side with appressed dense, broad and long glossy grey scales with a slender pencil of long pale ochreous scales from below knee appressed to inner side over grey scales,  $\frac{3}{4}$  of the length of the tibia; tarsus pale ochreous, slightly irrorated with light brown above, except on articulations.

Fore wing rather narrow, elongate-subovate, dilated, costa hardly convex anteriorly, pterostigma elongate, corrugated, distinct, gently prominent along costal edge which is tolerably straight beyond it; apex obtusely pointed, termen moderately curved, long, oblique. Ochreous-whitish, irrorated with greyish-fuscous. Markings pale tawny-ochreous partially obscured by fine transverse fuscous strigulation, marked with dark fuscous. Basal patch to beyond one-fourth of costa, reaching slightly farther on dorsum, with posterior edge angulate below fold, straight and rather oblique above and below angulation; irrorated with fuscous along costa, on basal third and along upper third of posterior edge, containing an irregular rounded paler greyish-fuscous (ill-defined) patch in the middle, shifted out of the centre posterad, but not reaching posterior edge; coarse dark fuscous irroration marking posterior edge of basal tawny third of basal patch, the middle of central greyish spot and angulation of posterior edge of basal patch; space between basal patch and central fascia suffused throughout with fuscous-grey, except costa, upper half of anterior, and entire posterior edge, and becoming denser and darker downward; three minute dark points on costa; central fascia rather oblique, extremities narrow; anterior edge gently prominent at upper fourth, concave thence; tooth robust, slightly upturned; upper half of posterior edge of fascia serrulate, irregularly suffused with dark fuscous, lower half slightly notched in the middle; pterostigma and area below it suffused with greyish, spot below pterostigma ochreous-fuscous with a faint traversing brownish line; pretornal dorsal patch moderate, rounded, tawny-fuscous, indistinctly surrounded by pale fuscous suffusion, which is marked with dark fuscous strigulae converging above pretornal patch, and continued as a well-defined zigzag line to top of terminal patch, but angulated below substigmal spot; terminal patch large, rounded, with obliquely truncate top, dull tawny-fuscous; both costal spots elongate, rather narrow, the posterior subtriangular, encircled by indistinct

greyish strigulation; apical spot represented by a fuscous transverse sub-apical bar reaching to termen below apex. Cilia sordid fuscous-ochreous, with a dark fuscous subbasal shade interrupted well below apex, and with a faint subapical shade.

Hind wing triangular, apex rather pointed, termen tolerably straight, very oblique, dorsum broadly rounded. Vein 2 from beyond  $\frac{2}{3}$ , shortened, 3 and 4 connate, strongly diverging, short, 4 gradually curved, 5 parallel to 4, distant, 6 and 7 closely approximated towards the base (appearing stalked). Semipelluculent, pale greyish-fuscous, with faint lilac gloss, sparsely haired, only the apex with fuscous scales (between veins 6 and 7 and slightly beyond them); cell and area above it, and slightly beyond it with greenish-golden prismatic gloss. Cilia pale fuscous, cilia from base of vein 4 downward with tips becoming glossy white, cilia along dorsum white.

Male genitalia (text fig. 24). Tegumen with the top somewhat smaller and more rounded laterally than in *ambigua*. Socius, a prominence under the top of the tegumen, with a few minute bristles. Gnathos weak, relatively narrow at the sides, less narrowed mediad, median incision of lower edge deep and abrupt; anus very weak, its connection with the gnathos not clear. Valva shorter and broader; cucullus hammer-like, rather variably shaped (sometimes slightly broader or smaller than in the figure 1); with broad, rounded top; sacculus rather narrow, long; Spc<sub>1</sub>, a very dense cluster of spines of different sizes and shapes. Aedoeagus long, curved. (Slide figured: 1392). The male genitalia approach those of the palaeartic *Lobesia (Lobesia) littoralis* (Westwood) rather closely.

Extremely variable species. The above description of the male is made after a specimen from Nongkodjadjar (cf. above); a specimen from Buitenzorg, West Java, e.g., differs in the following respects: all markings bright ochreous-tawny; greyish irroration deep leaden-grey (making the round spot in the middle of the basal patch very conspicuous); posterior edge of basal patch less angulate, its upper and lower halves slightly sinuate; the fore wing itself slightly broader, with a more rounded apex; the hind wing, however, is congruent in all details, as well as are the genitalia.

♀ 9-11 mm. Greyish spot in centre of basal patch erect-ovate, smaller and less rounded than in male. Otherwise extremely variable as to the colouring, the markings, and even to the shape of the fore wing.

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1) The exact shape of the cucullus should be studied and compared with the valva as much as possible in the same position in each specimen; when the valva is turned around its longitudinal axis, its shape and especially that of the cucullus changes considerably. Compare textfig. 20 (*lithogonia*) in which the left and the right valvae make the impression of being differently shaped, due to the difference in their position).

Hind wing elongate-semiovate, more or less pointed, termen more or less concave on vein 5; vein 2 from beyond  $\frac{2}{3}$ , 3 and 4 connate, moderately diverging, tolerably straight, vein 5 also rather straight, moderately approximated at base, 6 and 7 closely approximated towards base. Light to dark bronze-brown, with paler base, and whitish costa. Cilia light to dark fuscous, with pale base, and a dark fuscous subbasal shade.

Female genitalia (text fig. 15). Limen, a short and narrow curved band in the middle, with a moderate, rounded-triangular lobe at each side. Colliculum inverted-funicular, with truncate top, and with a strong median longitudinal ridge. (Slide figured: 1418).

Type, ♀, East Java, Mount Ardjuno (Hekmeyer) (Coll. Snellen); green label in van Eecke's hand "TYPE"; "M 99" in Meyrick's hand (genit. slide 1387). Faded and rather damaged. Corresponding cotype specimen apparently lost.

The redescribed male is from East Java, Tengger Mountains, Mount Tunggangan near Nongkodjadar, 1500 m, in light trap, 50.X.1940 (genit. slide 1392) (A. M. R. Wegner). Another male specimen cited in my redescription and compared with the former is from West Java, Buitenzorg, 250 m, 10.X.1948, in light trap (E. J. Beeltje).

Other material studied.

West Java. "Java, Buitenzorg, 1893", "*Discordana m.*", in Snellen's hand, 1 ♀, abdomen and hind wings missing (Snellen Collection). "Java, Preanger, 5000 feet, Sijthoff", 1 ♂, abdomen broken (Sijthoff leg., Snellen Collection). Buitenzorg, 250 m, bred from larvae on *Ricinus communis* (Euphorbiaceae), 1921 (W. C. van Heurn), 13 ♂, 13 ♀ (genit. slides, ♂ 521, ♂ 1385, ♀ 1384). The same locality, 27.VI.1948. 1 ♀ (genit. slide 1472), 6.VII.1948, 1 ♂ (genit. slide 1440), 15.VII.1948, 1 ♀ (genit. slide 1452), 18.VII.1948, 1 ♀ (1474), 11.VIII.1948, 1 ♀ (1460), 19.VIII.1948, 1 ♀ (1463), 7.IX.1948, 1 ♀ (1462), 17.IX.1948, 2 ♀ (1418, 1473), 9.I.1949, 1 ♂ (1441), 22.V.1949, 1 ♂, 15.VI.1950, 1 ♀ (1461), 17.VII.1950. 1 ♂ (1447), 24.VIII.1951, 1 ♀ (1501) (F. C. Drescher). 21.IX.1948, 1 ♂ (1445) 10.X.1948, 1 ♂ (1386), (E. J. Beeltje); 23.III.1948, 1 ♀ (1456) (A. M. R. Wegner). Pasar Minggu, 40 m, bred from larvae in flowers of *Citrus*, II.1940, 3 ♂, 2 ♀ (slides, ♀ 1427, ♀ 1428, ♀ 1476) (C. Franssen). Tapos, 800 m, bred from larvae in shoots of a Papilionaceae, VIII.1941, 1 ♀ (slide 1480) X.1941 (no food plant indicated), 1 ♂ (L. G. E. Kalshoven).

Central Java. Semarang, teak forest, 27.VI.1931, no. 543, 1 ♀; Semarang, Gedangan, 40 m, 26.VI.1931, no. 600, bred from larvae in flowers of *Melochia indica* (Sterculiaceae), 1 ♀ (slide 1485); Semarang, Seneng,



teak forest, 8.I.1931, no. 766, 2 ♀ (slide 1479) (L. G. E. Kalshoven).

East Java. Pasuruan, 5 m, 24.VII.1939, 1 ♀ (1414), 8.I.1940, 1 ♀ (1458), 22.VII.1940, 1 ♀ (1457) (A. Diakonoff).

Melanistic form. One male from Buitenzorg, 250 m, collected on lamp light, 4.IV.1951 (F. C. Drescher) and structurally in all respects similar to *aeolopa* (genit. slide 1395) has body and fore wings evenly and densely suffused with dark leaden grey to such an extent that these markings (tinged tawny-grey) tend entirely to disappear. The hind wing is tinged greyish but with the same greenish prismatic area as usual.

**Lobesia (Lobesia) aeolopa** forma ♀ **dryopelta** Meyrick, 1932, status nov.

*Lobesia dryopelta* Meyrick, 1932, Exot. Microl., vol. 4, p. 225 (♂, ♀; Central Java, "teak forest" (= Telawa)). Diakonoff (partim), Bull. Brit. Mus., Ent., vol. 1, p. 292 (lectotype ♂ designated, genit. ♂, ♀ descr.; occurs also in West Java, Buitenzorg, and South India, Coimbatore), pl. 3 fig. 3 (gen. ♂), pl. 4 fig. 9 (gen. ♀).

♀ 9-11 mm. Head and palpus suffused with tawny-brownish. Thorax tawny-brown, speckled with pale ochreous (tips of scales). Fore wing more or less densely suffused throughout with tawny brownish, this suffusion obscuring the markings (the suffusion is especially dense in two females from Pasuruan). Hind wing normal. Structurally in all respects congruent with the nominal form.

The two specimens from Telawa (Central Java) and Pasuruan (East Java) have been bred from larvae on *Pluchea indica*. Is this coincidence, or are we dealing with a biological race? This form can not be technically separated from the nominal form.

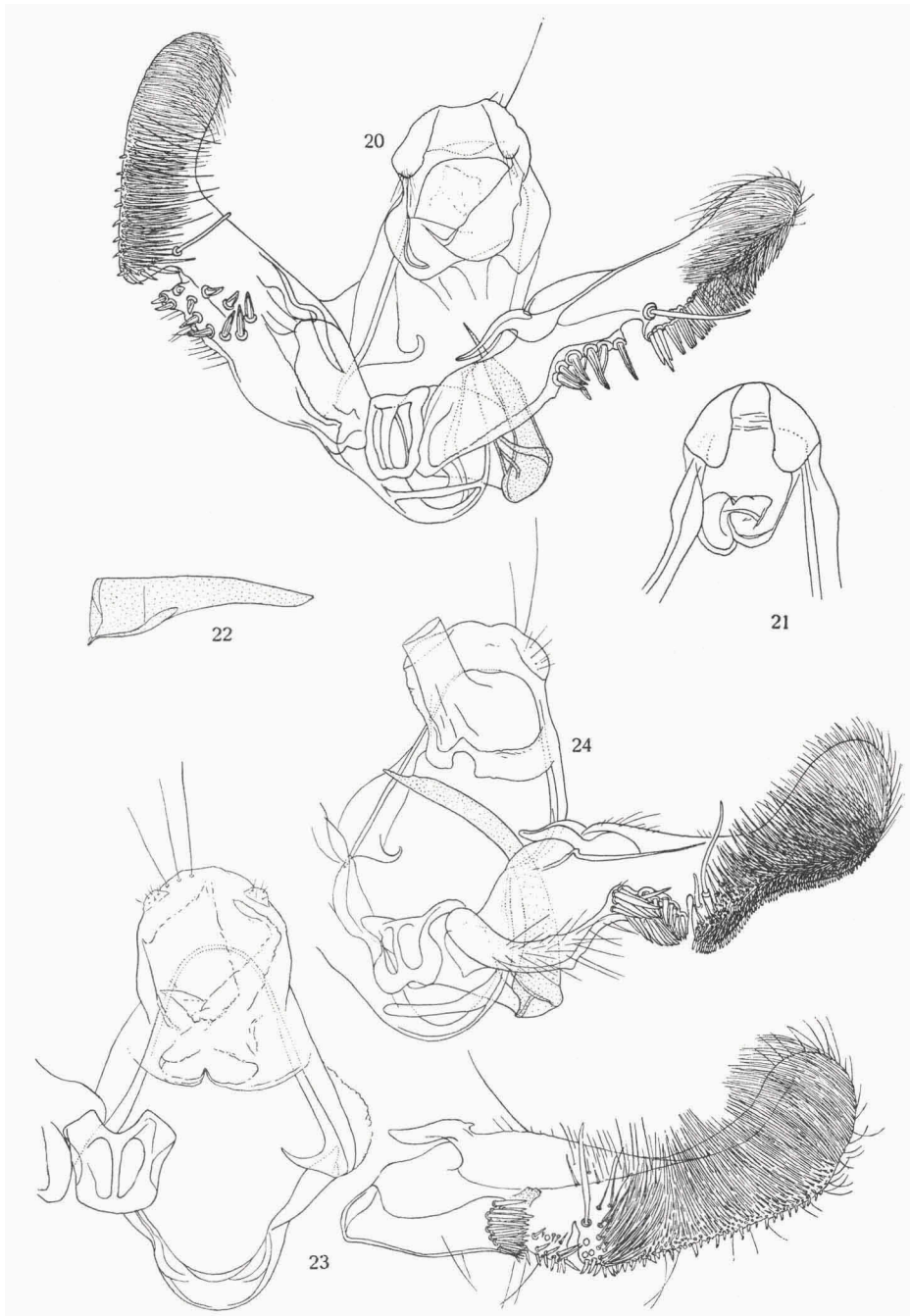
First I hoped to preserve the name *dryopelta* in a subspecific sense, but it soon appeared untenable, as the nominal form of *aeolopa* occurs in both the localities concerned.

Material studied. Central Java. Semarang, teak forest, bred from larvae on leaves of *Pluchea indica* (Compositae), 24.VI.1931, no. 542, "*Lobesia dryopelta* n. sp. det. Meyr. '32" = Meyrick's cotypes, 2 ♀ (genit. slide 1424); no indication of food plant: 19.VI.1931, 1 ♀ (1431), 20.VI.-1931, 1 ♀ (1432), 23, 24 and 26.VI.1931, 4 ♀ (L. G. E. Kalshoven). Telawa, teak forest, 18.IX.1935, no. 1634, 1 ♀ (slide 1478) (L. G. E. Kalshoven). East Java. Pasuruan, 5 m, bred from larvae spinning top leaves of *Pluchea indica*, 5.X.1939, 1 ♀ (genit. slide 1405); in light trap, 17.III.1941, 1 ♀ (1406) (A. Diakonoff).

**Lobesia (Lobesia) lithogonia** spec. nov. (text figs. 20, 21, 26)

λίθος = stone, γωνία = angle

♂ 10-12 mm. Head with face light tawny, vertex deeper tawny, tufts on



Figs. 20-24. Male genitalia of *Lobesia*. 20, *Lobesia (Lobesia) lithogonia* spec. nov.; 21, the same, tegumen with somewhat contorted gnathos; 22, *L. (Lobesia) xylistis* (Meyr.), aedeagus; 23, the same, general aspect; 24, *L. (Lobesia) aeolopa* Meyr.

vertex tipped with dark brown. Antenna light ochreous, ringed with brown. Palpus moderate; basal segment light ochreous, median segment ochreous tinged brownish in the middle, a subapical blackish transverse band; terminal segment short, rather pointed, pale ochreous. Thorax brownish, faintly marked with deeper brown in the usual way: an anterior transverse band and two transverse submedian spots, posterior tuft concolorous. Legs, anterior and median pale ochreous, densely suffused and irrorated with dark brown except two rings on tibiae and articulations of tarsal segments; posterior femur grey, inner side whitish; a pecten of short fine white hairs along the lower edge; posterior tibia glossy dark grey, below and inwardly clothed with long appressed scales upon which is closely appressed a slender expansile pale ochreous pencil from below the base of tibia, not reaching its apex. Abdomen dark fuscous-grey, base ochreous-fuscous, anal tuft light ochreous, venter pale fuscous. Abdominal pouches broadly semioval, scales dense, rather pale.

Fore wing moderately broad, dilated, elongate-subovate; costa gently convex at the base, straight beyond this, tolerably straight before apex, pterostigma elongate, thickened, moderately prominent along costal edge, apex little rounded, sometimes rather pointed, termen moderately rounded, oblique. Whitish-ochreous, suffused except edge of markings with fuscous-grey, markings tawny, more or less infuscated, and marked with dark fuscous-brown. Basal patch to beyond one-fourth of costa, posterior edge variable, in the holotype moderately angulate in the fold, above and beneath angulation tolerably straight; tawny, including a large central patch of ochreous-whitish, transversely and densely strigulated with grey, in centre irrorated with blackish; this patch extending from below costa almost to dorsum, with a small posterior projection almost reaching the posterior edge of the basal patch; basal portion of this patch posteriorly, and its posterior edge, with transverse dark brown marks; interspace between basal patch and central fascia filled with lilac-grey suffusion not reaching costa, downward becoming darker and speckled with blackish, all other markings exactly as in the preceding species (it seems of no use to repeat the description), tooth of central fascia slightly below the middle, upper half of posterior edge of fascia sparsely suffused with blackish-fuscous; terminal patch large rounded-oval, top hardly truncate, apical patch round, both these patches tawny-fuscous, apical patch in its centre clouded with dark fuscous; a narrow interrupted dark fuscous line along termen to apex, obliterate below terminal patch. Cilia pale ochreous, clouded with grey, grey in tornus, brown above apex; a moderate tawny subbasal interrupted shade.

Hind wing pointed, subtriangular, termen tolerably straight, slightly

notched on vein 5, dorsum rounded; 2 from  $\frac{2}{3}$ , curved, 3 and 4 connate, diverging, short, 4 curved, 5 parallel to 4, 6 and 7 closely approximated towards base. Semipellucent, sparsely hairy, pale fuscous, with prismatic reflections, those in and beyond the cell greenish; apex suffused with dark fuscous, this suffusion mostly darker, and more extended than in *aeolopa*. Cilia fuscous with darker subbasal shade, becoming white towards dorsum, white on dorsum.

Male genitalia (text figs. 20, 21). Tegumen as in *aeolopa* but with the lateral lobes longer. Socius, a moderate pending lobe with a group of minute bristles at its top. Gnathos weak, broad at the sides, in the middle folded, incision of lower edge not distinct; anus not traceable. Valva somewhat longer than in *aeolopa*, hammer-like; cucullus more slender and longer than in that species (cf. footnote on page 47); sacculus strong, broader than in *aeolopa*, smaller than in *ambigua*; Spc<sub>1</sub>, a small group of stout spines, connected dorsally and ventrally with Spc<sub>2</sub> that is formed of some four thick spines. Aedoeagus short, hardly curved. (Slide figured: 1389).

♀ 9-12 mm. Head and thorax brighter tawny-ochreous. Abdomen fuscous-grey, anal tuft pale ochreous. Fore wing also more brightly tinged tawny-ochreous; basal patch containing only a faint, rather small, pale ochreous central spot, hardly suffused with grey, centred with dark fuscous irroration, with posterior projection entirely interrupting fasciate posterior third of basal patch; grey suffusion between basal patch and central fascia forming a rather well-defined erect triangle, below pterostigma somewhat more extended than in the male; terminal patch variably shaped, mostly large, sometimes elongate-ovate or rounded.

Hind wing semiovate, of variable width, apex moderately pointed, termen distinctly sinuate on vein 5; 2 from  $\frac{3}{5}$ , 3 and 4 connate, 5 little approximated at base, distant, 6 and 7 closely approximated towards base. Rather deep bronze-brown, basal third becoming semipellucent, greyish. Cilia concolorous or slightly paler, a darker subbasal line.

Female genitalia (text fig. 26). Limen a narrow long curved median band, with a long plate at each side. Colliculum a long tube, upper portion spindle-shaped, with thick walls, lower portion inverted-funicular. (Slide figured: 1422).

Holotype, ♂, West Java, Buitenzorg, 250 m, 17.VII.1950 (F. C. Drescher) (genit. slide 1439).

Allotype, ♀, the same locality, 4.VII.1948 (F. C. Drescher) (genit. slide 1466).

Other material studied.

West Java, Buitenzorg, 250 m, on lamp light, 2.VII.1948, 1 ♀ (genit.

slide 1464), 14.VII.1948, 1 ♀ (genit. 1419), 18.VII.1948, 1 ♀ (genit. 1469), 19.VII.1948, 1 ♀ (genit. 1459), 22.VII.1948, 1 ♀ (genit. 1471), 23.VIII.1948, 1 ♀ (genit. 1416), 24.IX.1948, 2 ♂ (genit. 1388 and 1440), 11.I.1949, 1 ♂ (genit. 1442), 1.IV.1949, 1 ♂ (genit. 1389), 16.II.1950, 1 ♀ (genit. 1465), 3.VIII.1950, 1 ♀ (genit. 1467), 9.VII.1951, 1 ♀ (genit. 1499), 15.VII.1951, 1 ♀ (genit. 1498) (F. C. Drescher); 25.X.1948, 1 ♂ (genit. 1443), 27.I.1950, 1 ♀ (genit. 1417), 12.II.1950, 1 ♀ (genit. 1468), 14.III.1950, 1 ♂ (genit. 1444), 14.VIII.1950, 1 ♂ (genit. 1393) (E. J. Beeltje); 16.II.1949, 1 ♀ (genit. 1470) (A. Diakonoff). Bandung, 750 m, 4.VI.1925, 1 ♀ (genit. 1422) (A. Diakonoff). Central Java, Telawa, larva on leaves of *Eugenia densiflora* (Myrtaceae), 23.XII.1933 (L. G. E. Kalshoven), 1 ♀ (genit. 1660).

East Sumatra, Fort de Kock, 920 m, March, 1922, 1 ♀ (genit. 1407) (E. Jacobson).

South East Borneo, Ampah, 0-20 m, IV-V.1948, 1 ♀ (genit. 1415) (Liem Swie Liong).

It is possible to discriminate this species superficially from *aeolopa*, with which it must be closely related. The specific variations of these two species overlap entirely. The present species is slightly larger than *aeolopa* but smaller than *ambigua*. Even the hind wing in the male is absolutely congruent as to the shape and the neuration; perhaps it is slightly denser and darker suffused towards apex, and with more extended prismatic gloss than in *aeolopa*.

#### **Lobesia (Lobesia) orthomorpha** (Meyrick, 1928)

*Polychrosis orthomorpha* Meyrick, 1928, Exot. Microl., vol. 3, p. 443 (♀! New Hebrides, Efate).

Distribution: New Hebrides.

The lectotype of this species (genitalia slide no. 7051) in the British Museum is a male! The male genitalia are rather similar to those of *L. (L.) lithogonia* nov. spec.

#### **Lobesia (Lobesia) transtrifera** (Meyrick, 1920)

*Polychrosis transtrifera* Meyrick, 1920, Exot. Microl., vol. 2, p. 346 (1 ♀! Queensland, Brisbane).

Distribution: Australia, Queensland.

The holotype of this species in the British Museum, genitalia slide no. 7324, is a male! The genitalia are again similar to those of *lithogonia*.

#### **Lobesia (Lobesia) serangodes** (Meyrick, 1920)

*Polychrosis serangodes* Meyrick, 1920, Exot. Microl., vol. 2, p. 346 (♂, ♀, North West India, Abbottabad).

Distribution: North West India.

Male genitalia are of a type more or less intermediate between those of *lithogonia* and *clarisecta*, and similar to that of two not yet described small species from the island of Sumba. The cucullus is not clavate,  $Spc_1$  and  $Spc_2$  are formed of sparse short spines, and closely connected with each other.

**Lobesia (Lobesia) xylistis** (Lower, 1901) (text figs. 22, 23, 25)

*Byrsoptera xylistis* Lower, 1901, Trans. Roy. Soc. S. Austral., vol. 25, p. 77 (♂, ♀, Queensland, Cooktown).

*Polychrosis xylistis*, Meyrick, Proc. Linn. Soc. N. S. Wales, vol. 36, p. 256, 1911. Ins. Samoa, vol. 3, p. 75, 1927 (sex? Samoa).

Distribution: Australia, Queensland; Samoan Islands.

Male genitalia (text figs. 22, 23) are of the apomorph type, very similar to those of the following four species, and show a correlation with those of the subgenus *Polychrosis*. Valva with a hardly clavate cucullus,  $Spc_1$  and  $Spc_2$  almost united, forming together a large oblique patch. (Specimen studied and figured: 1 ♂, "Samoa Islands, Tutuila Island, Pago Pago, 14.XII.1925. P. A. Buxton and G. H. Hopkins", from Meyrick's Collection. Genitalia slide no. 1754 D).

Abdominal scent organ in male with long, slender pouches, filled with not numerous pale scales.

Tibial pencil slender, pale ochreous, closely appressed to the inner side of tibia, posteriorly concealed in a furrow of hairs.

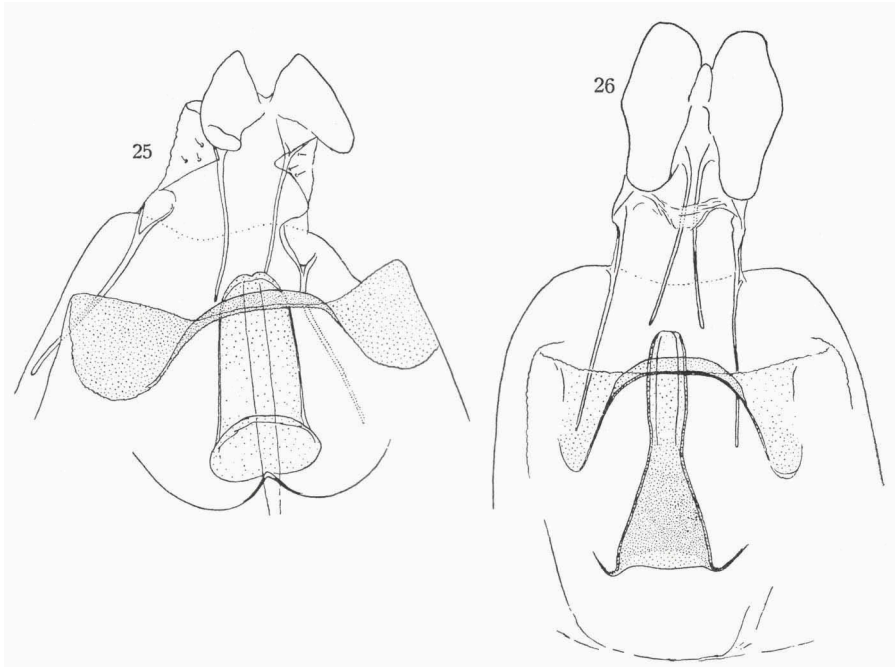
Female genitalia (text fig. 25) with ostium and colliculum shaped as a moderate naked cylinder; limen present, a narrow transverse band, slightly dilated laterally, with small lateral plates. (Specimens studied: 1 ♀, "Samoa Islands, Malololelei, Upolu, 2000 ft., 25.VI.1924. P. A. Buxton and G. H. Hopkins", from the Meyrick Collection; genitalia slide no. 1755 D. 1 ♀, "Townsville, Queensland, F. P. D., bred 17.XI.1899" (in Meyrick's hand), from the Meyrick Collection; genitalia slide no. 1752 D).

**Lobesia (Lobesia) rhipidoma** (Meyrick, 1925)

*Polychrosis rhipidoma* Meyrick, 1925, Exot. Microl., vol. 3, pp. 142-143 (♂, Fiji, Labasa; foodplant *Clerodendron amnicorum*).

Distribution: Fiji Islands.

Male genitalia of the holotype in the British Museum, no. 7052, are similar to those of *clarisecta*, with  $Spc_1$  and  $Spc_2$  almost entirely united. The neuration of the fore wing is identical to that in the palaeartic *reliquana*.



Figs. 25-26. Female genitalia of *Lobesia*. 25, *Lobesia (Lobesia) xylistis* (Meyr.); 26, *L. (Lobesia) lithogonia* spec. nov.

### ***Lobesia (Lobesia) clarisecta* Meyrick, 1932**

*Lobesia clarisecta* Meyrick, 1932, Exot. Microl., vol. 4, p. 308 (♂, ♀, Kashmir). Diakonoff, Bull. Brit. Mus., Ent., vol. 1, p. 291, pl. 3 fig. 2 (genit. ♂), pl. 4 fig. 13 (genit. ♀), 1950 (descr. genitalia).

*Lobesia (Lobesia) clarisecta*, Obraztsov, Tijdschr. Entom., vol. 56, p. 91, 1953.

Distribution: Kashmir, Gullmarg.

Male genitalia (cf. my figure cited above) with the cucullus hardly clavate,  $Spc_1$  and  $Spc_2$  almost entirely united, forming together an oblique patch of spines; they are very similar to those of the two preceding species.

Female genitalia with colliculum, a large naked cylinder; limen present.

### Subgenus **Lobesiodes** nov.

Gnathos membranous, with a median process connected with the anal tube. Valva with cucullus curved, not narrowed, densely bristled; sacculus (text fig. 2) scalloped, strongly sclerotized, with  $Spc_1$  and  $Spc_2$  entirely separate, strongly developed, especially  $Spc_2$ . Fore wing with pterostigma ill-defined, with veins 9-11 equidistant and not sinuate. Male with a tibial pencil.

Type of the subgenus: *Sericoris euphorbiana* Freyer, 1842 (text fig. 2). (Palearctic).

Another species that I attribute to this subgenus is *Polychrosis carduana* Busck, 1907 (Nearctic).

When recently reinvestigating the types of the South Asiatic species of *Lobesia* in the British Museum, I also made occasional notes on some species from that and other tropical regions in that Museum, which species were originally attributed either to *Polychrosis* or to *Lobesia*. Though being far from exhaustive, these notes are published here, as they form a small addition to our knowledge of the genus *Lobesia*, and may help to limit it.

#### Some veritable species of the genus *Lobesia*

At present I am not in a position to determine the subgeneric position of the following species. However, they all belong to the genus *Lobesia* Guenée, 1845.

The following species, attributed to the genus *Lobesia* by Obraztsov, but accompanied by a question mark, in my opinion indeed belong to this genus:

*Lobesia thlastopa* Meyrick, 1937, Iris, vol. 51, p. 181 (China).

*Polychrosis neptunia* Walsingham, 1907, Proc. Zool. Soc. Lond., 1907, p. 1000, pl. 53 fig. 1 (Canary Islands).

Furthermore, the following species are true *Lobesia*:

*Polychrosis metachlora* Meyrick, 1913, Ann. Transv. Mus., vol. 3, pp. 275-276 (Transvaal).

*Lobesia peplotoma* Meyrick, 1928, Exot. Microl., vol. 3, pp. 442-443 (New Hebrides).

*Polychrosis scorpiodes* Meyrick, 1908, Proc. Zool. Soc., 1908, p. 717 (Transvaal).

#### Dubious species of the genus *Lobesia*

The following two species are represented by female unique type specimens only (in the British Museum). They might belong to *Lobesia*, but I am not certain of it, as long as no males are available for study:

*Polychrosis orphica* Meyrick, 1920, Exot. Microl., vol. 2, p. 347 (Assam).

*Polychrosis pedias* Meyrick, t.c., p. 347 (India).

The following species may belong to *Lobesia* but its affinity is dubious, pending further investigation:

*Polychrosis paraphragma* Meyrick, 1922, Exot. Microl., vol. 2, p. 522 (China).



Apocryphal species of the genus *Lobesia*

It is not my intention to determine here the true generic position of the following species. I hope to deal with some of them in due course, within the scope of this revision. At present I only wish to emphasize that they obviously have nothing to do with the genus *Lobesia* Guenée, 1845.

*Polychrosis acanthis* Meyrick, 1920, Exot. Microl., vol. 2, p. 348 (India).

*Polychrosis anceps* Meyrick, 1909, Journ. Bombay Nat. Hist. Soc., vol. 19, p. 588 (India).

*Polychrosis anconia* Meyrick, 1911, Proc. Linn. Soc. N.S. Wales, vol. 36, p. 257-258. Turner, Trans. Roy. Soc. S. Austral., 1925, vol. 49, p. 57. (Regards *Epichorista pleurosema* Turner, 1916, l.c., vol. 40, pp. 515-516, as a synonym of *anconia* Meyr.) (Australia).

*Polychrosis arenacea* Meyrick, 1917, Trans. ent. Soc. Lond., pp. 23-24 (South America).

*Polychrosis chionolitha* Meyrick, 1938, Trans. ent. Soc. Lond., vol. 87, p. 511 (Papua).

*Chrosis ephippias* Meyrick, 1907, Journ. Bombay Nat. Hist. Soc., vol. 17, p. 731. *Polychrosis ephippias*, Meyrick, 1909, l.c., vol. 19, p. 587 (India). (Was recorded by Meyrick also from South Africa, cf. Ann. Transv. Mus., 1918, vol. 6, p. 11, but this record needs further confirmation).

*Polychrosis fallax* Meyrick, 1909, Journ. Bombay Nat. Hist. Soc., vol. 19, p. 587 (India).

*Polychrosis formalis* Meyrick, 1933, Mat. Micr. Chin. Prov., p. 57 (China).

*Polychrosis gabina* Meyrick, 1909, Journ. Bombay Nat. Hist. Soc., vol. 19, p. 588 (India).

*Batodes incultana* Walker, 1863, List Lep. Brit. Mus., vol. 27, pp. 316-317 (Africa).

*Polychrosis inflicta* Meyrick, 1920, Exot. Microl., vol. 2, p. 347 (India).

*Polychrosis mechanodes* Meyrick, 1936, Exot. Microl., vol. 4, pp. 611-612 (China).

*Polychrosis oxymochla* Meyrick, 1917, Trans. ent. Soc. Lond., pp. 24-25 (South America).

*Synthozyga psammetalla* Lower, 1901, l.c., vol. 25, p. 70. *Polychrosis psammetalla*, Meyrick, 1911, Proc. Linn. Soc. N. S. Wales, vol. 36, p. 258 (Australia). I was not able to study Lower's type. If the specimens placed in the Meyrick Collection in the British Museum under the name of "*Polychrosis psammetalla* Lower" are correctly identified—and there is no special reason to doubt this—then *psammetalla* does certainly not belong

to *Lobesia*, and the generic name *Synthozyga* Lower, 1901, is not a synonym of *Polychrosis* Ragonot, 1894, as Meyrick suggested (cf. above, p. 15).

*Polychrosis sedifera* Meyrick, 1911, Proc. Linn. Soc. N. S. Wales, vol. 36, pp. 256-257 (Australia).

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#### EXPLANATION OF THE PLATES

##### Plate I

Figs. 1-5. Pterostigma in denuded wing. 1, *Paralobesia andereggiana* (H. S.); 2, *Lobesia (Lobesiodes) euphorbiana* (Fr.); 3, *Lobesia (Lobesia) reliquana* (Hb.); 4, *Lobesia (Lomaschiza) fetialis* Meyr.; 5, *Lobesia (Polychrosis) vitisana* (Jacq.). (Phase contrast microphotographs).

##### Plate II

Figs. 1-5. Neuration of the fore wing. 1, *Paralobesia andereggiana* (H. S.); 2, *Lobesia (Lobesiodes) euphorbiana* (Fr.); 3, *Lobesia (Lobesia) reliquana* (Hb.); 4, *Lobesia (Polychrosis) vitisana* (Jacq.); 5, *Lobesia (Lomaschiza) fetialis* Meyr. (Microphotographs).

##### Plate III

Figs. 1-5. Genitalia of *Lobesia*. 1, *Lobesia (Lomaschiza) genialis* Meyr., gnathos; 2, *L. (Lom.) fetialis* Meyr., gnathos; 3, the same, valva; 4, *L. (Lom.) genialis*, valva; 5, *Lobesia (Lobesia) reliquana* (Hb.), valva; 6, *Lobesia (Polychrosis) vitisana* (Jacq.). (Microphotographs).

