A taxonomic revision of the genus *Deltophora* Janse, 1950 (Lepidoptera: Gelechiidae)

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Synopsis

The genus *Deltophora* Janse with species on all continents is revised. The primary types of all but one of the discussed species have been examined. Nineteen species and two subspecies are regarded as valid. Thirteen new species and one new subspecies are described; one new synonym in the family group is established; one species is reduced to subspecies rank; one species is recalled from synonymy and six new generic combinations are introduced. Aspects of the suprageneric classification of the Gelechiidae and the systematic position of *Deltophora* are discussed. Keys to the species are provided and all species and their genitalia are described and illustrated. The tribe Metzneriini Piskunov, 1975, is synonymized with Aristoteliinae Heslop, 1938.

Introduction

The genus *Deltophora* was proposed by Janse in 1950 for a South African species; further species, including a number of undescribed ones, from the tropical to temperate zones of Africa, Europe, Asia, America and Australia now also have to be included in this genus.

I have examined the primary types of all nominal species included in this paper, with the exception of *peltosema* Lower of which I have seen only a photograph.

The literature on the subject was considered as completely as possible and about fifty publications dealing with *Deltophora* species are listed in the Bibliography (pp. 305–307). A complete bibliography for each species is recorded in my card index from which detailed information will be made available on request. Bibliographic references in the systematic part of this paper are confined to publications from which unchecked information was extracted for the present study or which contain taxonomic changes and other important information. Misidentifications which

Bull. Br. Mus. nat. Hist. (Ent.) **38** (6) : 263–322 Issued 31 May 1979

have been corrected by re-examination of the relevant specimens are also recorded. Excluded are, in particular, check-lists and faunistic papers unless they fall into one of the above categories.

The measurements at the beginning of each description are those of the fore wing length of the smallest and biggest specimen measured in millimetres from the base to the apex of the wing. In several instances the number of available specimens was limited and the variation in the size of those species may, of course, be greater than is indicated by the recorded measurements.

The photographs of the moths show the left-hand wings; where these were unsuitable for photography the right-hand wings were taken and the image was reversed.

The terminology of the genitalia follows Klots (1956). Details of the genitalia structures in *Deltophora* are discussed on pp. 271–273.

Under 'Distribution' only the countries are listed; however, if a species is restricted to a limited area of a country or if it is only known from one locality, this is expressed, for example, 'India (Punjab)' or 'E. Afghanistan'. All distribution records are based on material examined by myself unless stated otherwise. Each specimen is recorded in my card index and bears my determination label; type-specimens bearing full and unambiguous labels were merely recorded but not again labelled.

The spelling of locality names follows *The Times Atlas of the World* (Comprehensive Edn), 1968, unless there was good reason to proceed otherwise. If the spelling differs significantly from that on the specimen label, the latter is also cited, for example, 'Pul-i-Khumri ('Polichomri')'. When localities could be traced only with difficulty, detailed information is given, including the geographical latitude and longitude. The localities of some collectors are recorded in published locality lists, expedition reports or special papers (for example, Amsel, 1935 : 228; Essig, 1941; Kasy, 1964; 1965). Reference to such papers is made in the appropriate places.

The altitudes of localities (where recorded on the specimen labels) are uniformly cited in metres above sea level. Where the altitude is given in feet on a specimen label this is also cited, for example, '1800 m ('7000 feet')'. As almost all altitude data, particularly those on old labels, are merely estimates, they are converted to the nearest 50 m.

Distances are uniformly cited in kilometres. When the distance is given in miles on a specimen label this is also cited, for example, '32 km ('20 miles') . . .'. Distances up to 10 km are converted to the nearest 0·5 km, from 10 to 100 km to the nearest km, above 100 km to the nearest 10 km.

Abbreviations of museums and institutions

ANIC	Australian National Insect Collection, Division of Entomology, C.S.I.R.O., Canberra, Australia.
BMNH	British Museum (Natural History), London, U.K.
IAR	Institute for Agricultural Research, Samaru, Nigeria.
LN	Landessammlungen für Naturkunde, Karlsruhe, West Germany.
MCZ	Museum of Comparative Zoology, Cambridge, Mass., U.S.A.
MINGA	Muzeul de Istorie Naturală 'Grigore Antipa', Bucharest, Rumania.
MNHN	Muséum national d'Histoire naturelle, Paris, France.
MNHU	Museum für Naturkunde der Humboldt-Universität, Berlin, East Germany.
MZ	Museo de Zoología, Barcelona, Spain.
NM	Naturhistorisches Museum, Vienna, Austria.
NMNH	National Museum of Natural History, Smithsonian Institution, Washington, D.C., U.S.A.
SAM	South Australian Museum, Adelaide, Australia.
TM	Transvaal Museum, Pretoria, South Africa.
ZSBS	Zoologische Sammlung des Bayerischen Staates, Munich, West Germany.

Acknowledgements

I acknowledge gratefully the assistance with material and information received from Dr H. G. Amsel, LN, Karlsruhe, Mr E. Arenberger, Vienna, Mr K. Burmann, Innsbruck, Dr J. F. G.

Clarke, NMNH, Washington, Dr I. F. B. Common, ANIC, Canberra, Mr J. C. Deeming, IAR, Samaru, Dr W. Dierl, ZSBS, Munich, Dr T. Eichlin, Sacramento, Dr F. Español, MZ, Barcelona, Ing. W. Glaser, Vienna, Dr H. J. Hannemann, MNHU, Berlin, Dr R. W. Hodges, U.S.D.A./NMNH, Washington, Mr E. Jäckh, Bidingen, West Germany, Dr F. Kasy, NM, Vienna, Dr J. Klimesch, Linz, Lady L. Maxwell, St. Mary Bourne, U.K., Mr A. N. McFarland, SAM, Adelaide, Prof. J. T. Medler, Madison, Wisc., Dr A. Popescu-Gorj, MINGA, Bucharest, Mr M. J. Scoble, TM, Pretoria, Mrs J. C. Scott, MCZ, Cambridge, Mass., Dr L. Vári, TM, Pretoria and Dr P. Viette, MNHN, Paris. I am also indebted to my colleagues at the British Museum (Natural History), particularly Mr P. A. Brown, Dr G. S. Robinson, Mr W. G. Tremewan and Dr P. E. S. Whalley.

All photographs were taken by the Photographic Unit of the BMNH.

Remarks on the suprageneric classification of the Gelechiidae and the tribe Metzneriini Piskunov, 1975

The currently recognized classification of the Gelechiidae is essentially that proposed by Meyrick (1925) who primarily based it on the wing venation. Meyrick's nine genus-groups have since been given subfamily rank; his group 8 has been divided into the subfamily Brachmiinae and the three families Lecithoceridae, Symmocidae and Holcopogonidae. Meyrick's group 3 (subfamily Gelechiinae) has been subdivided into the three tribes Gelechiini, Gnorimoschemini and Teleiodini. These currently recognized suprageneric groupings are hardly comparable with each other and what one author considers a tribe is a separate family to another. For example, the genera around *Gnorimoschema* Busck were given tribe rank (Gnorimoschemini), whereas a comparable group of genera around *Symmoca* Hübner was accorded family rank (Symmocidae).

Most of the suprageneric divisions of the Gelechiidae are poorly defined and so are many of the 700–800 genera. It is not unusual to find genera placed in an incorrect subfamily or species of one genus scattered over several genera of different subfamilies. The genus *Deltophora*, the object of this paper, is no exception as will be seen below (p. 268). Studies during the past forty years have relied increasingly on genitalic characters, sometimes to the exclusion of the venation, and have led to numerous adjustments at the species and genus level. In recent revisions the genera are primarily based on characters of the male and female genitalia which permit more natural groupings than the venation. Gelechiid genera thus defined can clearly be identified morphologically and are frequently associated with particular host-plant groups (for example, *Ornativalva* Gozmány – *Tamarix* species; *Caryocolum* Gregor & Povolný – Caryophyllaceae; *Mirificarma* Gozmány – Leguminosae).

Recently, Piskunov (1975) proposed the tribe Metzneriini for the genera *Metzneria* Zeller, *Isophrictis* Meyrick, *Eulamprotes* Bradley, *Monochroa* Heinemann, *Paltodora* Meyrick, *Ptocheuusa* Heinemann, *Argolamprotes* Benander and *Pyncostola* Meyrick. He divided the Gelechiidae into the Gelechiini, Gnorimoschemini and Teleiodini, to which he added the Metzneriini as a fourth tribe, ignoring completely all previous subfamily divisions and overlooking that the mentioned three tribes are those of the subfamily Gelechiinae, whereas *Metzneria* and related genera belong to the Aristoteliinae.

In the Gelechiidae the wing venation is notoriously unstable, particularly in the apical region of the fore wing. In the typical gelechiid fore wing all radial and medial veins arise free from the cell, except R_4 and R_5 which share a common stalk. The stalking of M_1, and less frequently R_3, with R_{4+5} has developed several times independently, for example, in *Athrips* Billberg (=*Rhynchopacha* Staudinger) (Gelechiini), *Ephysteris* Meyrick (Gnorimoschemini), *Aproaerema* Durrant, *Syncopacma* Meyrick and related genera (Anacampsinae), and is of little value as a suprageneric character. According to Piskunov the Metzneriini are primarily characterized by the fore wing venation with R_5 and M_1 on a common stalk. This condition can only be confirmed for *Metzneria*, *Isophrictis* and *Ptocheuusa*, whilst in *Monochroa*, *Paltodora* and *Argolamprotes* M_1 arises free from the cell; in *Eulamprotes* M_1 was found stalked with R_5 in *wilkella* (Linnaeus) (=*pictella* Zeller) but separate in *atrella* ([Denis & Schiffermüller]). Thus the stalking of M_1 with R_5 is unsuitable as a character for separating a tribe Metzneriini as suggested by Piskunov.

Piskunov excluded *Aristotelia* Hübner from his new tribe and associated it with the *Dichomeris*-group instead. This is clearly unacceptable. In the Dichomerinae the structure of the first abdominal segments is specialized. The lateral margin of tergite 1 bears a sclerotized fold fused with a similar sclerotization which separates tergites 1 and 2 and extends along the lateral margin of tergite 2. In *Aristotelia* and the genera which Piskunov placed in the Metzneriini there is no sclerotization along the lateral margin of tergite 2 (Fig. 1). In the Metzneriini and *Aristotelia* the anterior margin of sternite 2 bears a pair of long apodemes which link the abdomen to the metathorax (Fig. 2); in the Dichomerinae no apodemes are present and the anterior margin of sternite 2 is developed into a pair of short corners. (The structure of the first abdominal segments is further discussed on p. 268). In the male genitalia the Dichomerinae are characterized by a highly specialized vinculum–saccus complex and an aedeagus with various lateral processes and strong cornuti; *Aristotelia* has a simple saccus and an aedeagus without strong cornuti and lateral processes. The female genitalia of the Dichomerinae are also highly specialized with a short ductus and a large corpus bursae with various strongly sclerotized folds; the ductus seminalis originates from the corpus bursae. In *Aristotelia* the ductus bursae is long, the corpus bursae spherical, with a single signum but without sclerotized folds; the ductus seminalis originates from the posterior parts of the ductus bursae at the colliculum. *Aristotelia* also differs from the Dichomerinae by the venation, labial palpi and other characters.

In several families of the Gelechioidea the antennal scape bears a pecten, usually a longitudinal row of long, narrow scales. On the inactive moth the antennae are extended backwards over or under the wings and the pecten then comes to rest over the eye. The function of such eye cover is unknown. In the Nepticulidae or other families where the scape is enlarged to a proper eye cap this may have a protective function, for example, in keeping high intensity light out; however, a thin pecten or a single isolated scale would hardly serve such a purpose. In the Gelechiidae antennal pectens are present in the Apatetrinae and some Gelechiinae (*Pexicopia* Common and related genera). A single deciduous scale is present on the scape of some Aristoteliinae, for example, *Monochroa rumicetella* (Hofmann), *hornigi* (Staudinger) and *Aristotelia brizella* (Treitschke), *subdecurtella* (Stainton), *mirabilis* (Christoph), while it is absent in other species of the same genera. The presence of a single erect scale on the scape of some species seems to link *Aristotelia* with *Monochroa* ('Metzneriini') rather than with the Dichomerinae which always lack an antennal pecten.

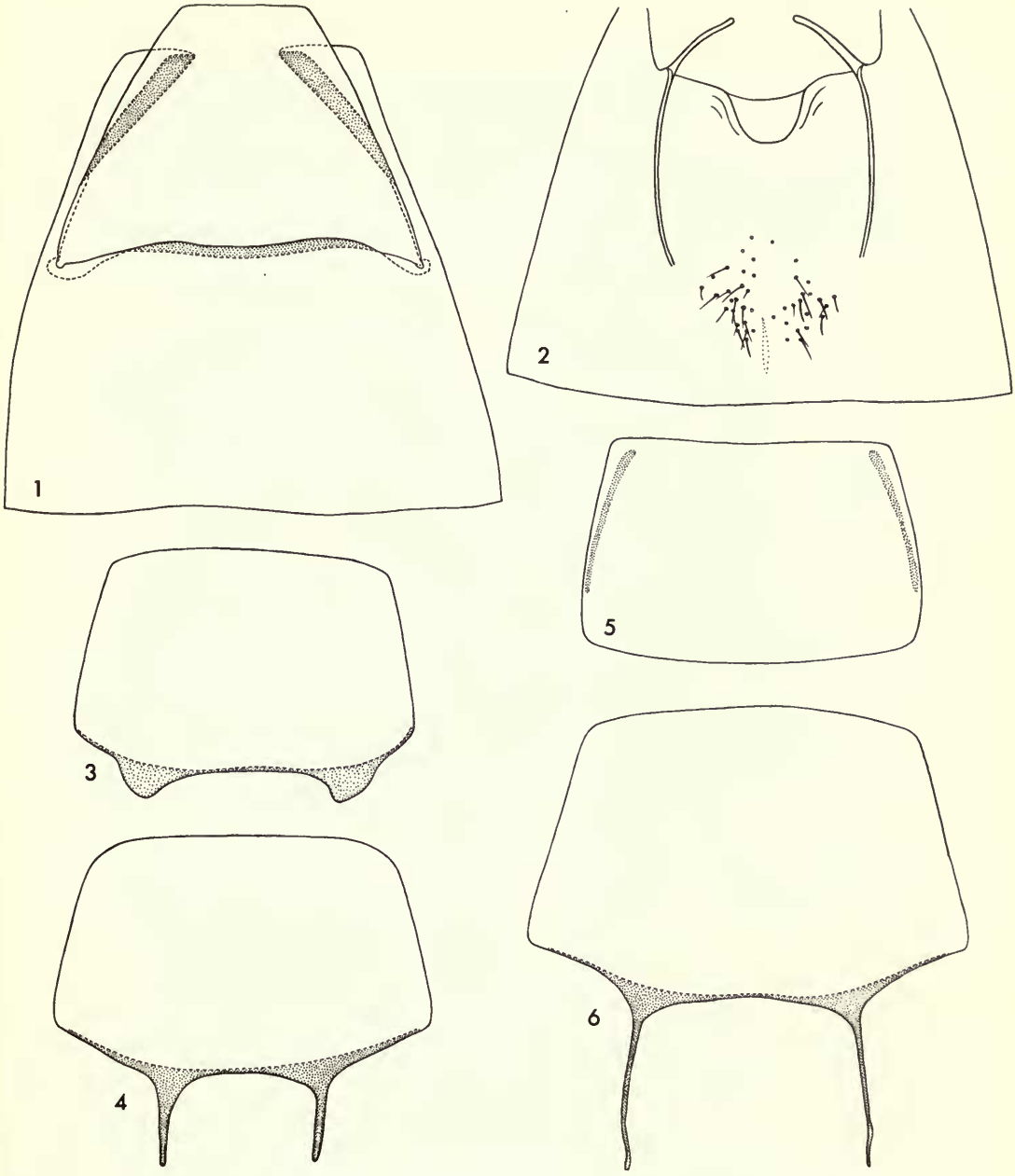
A further character linking *Aristotelia* with Piskunov's tribe Metzneriini and separating that genus from the Dichomerinae is the absence of the base of vein R_1 in the hind wing (see p. 271).

The only major character which seems to separate *Aristotelia* from the Metzneriini is the strong gnathos hook. However, even the presence of a gnathos in *Aristotelia* is not as important as it might look at first glance. The gnathos is part of the basic gelechiid structure and its absence in Piskunov's Metzneriini must be considered a secondary loss. Close examination shows a rudimentary gnathos to be present in *Eulamprotes atrella* ([Denis & Schiffermüller]), while remnants of gnathos arms are found in some *Monochroa* species and in *Deltophora*.

As shown above, Piskunov's opinion that *Aristotelia* is related to the Dichomerinae and that a new tribe is required for the genera associated with *Metzneria* cannot be confirmed. The tribe Metzneriini must therefore be placed in synonymy:

Aristoteliinae Heslop, 1938, *Cat. Br. Lepid.* : 78. Type-genus: *Aristotelia* Hübner, [1825].
Metzneriini Piskunov, 1975, *Ent. Obozr.* **54** : 857. Type-genus: *Metzneria Zeller*, 1839. **Syn. n.**
Metzneriidae Amsel, 1977 (nec Piskunov, 1975), *Beitr. naturk. Forsch. SüdwDtl.* **36** : 236. Unavailable name, see below.

Börner (1944 : 403) transferred *Metzneria* Zeller from the Gelechiidae to the Scythrididae: Scythridinae; however, this was universally rejected. Recently Amsel discussed Börner's view and, recognizing that *Metzneria* cannot be accommodated in the Scythrididae, proposed conditionally a separate family Metzneriidae (Amsel, 1977 : 236). He was apparently unaware that this latter name is antedated by Metzneriini Piskunov and is in any case unavailable because it is conditionally proposed (*Int. Code zool. Nom.*, Article 15). Börner's system of the Gelechioidea will be discussed in a separate paper.



Figs 1–6 1, 2, *Deltophora maculata* (Staudinger), first abdominal segments. (1) tergites 1 and 2. (2) sternite 2. 3, 4, *Monochroa* ♂, eighth abdominal sternite. (3) *M. tenebrella* (Hübner). (4) *M. nomadella* (Zeller). 5, 6, *Deltophora maculata* (Staudinger), ♂, eighth abdominal segment. (5) eighth tergite. (6) eighth sternite.

The structure of the first abdominal segments in the Gelechiidae

The importance of structures of the abdominal base for the classification of the Lepidoptera has been discussed by Börner (1939 : 1380). In the Gelechiidae the sclerites of the abdominal base provide useful characters for the suprageneric classification. The tergites 1 and 2 are not separated by an intersegmental membrane; their boundary is marked by a transverse sclerite which is usually narrow (Fig. 1) but sometimes dilated to a wide plate (for example in the Anacampsinae). Tergite 1 bears a pair of narrow lateral sclerites which may extend across the intersegmental boundary into tergite 2. Typically, sternite 2 bears a pair of sternal rods which approach the secondary arm of the metathoracic furca (Brock, 1971 : 42) and assist in linking the abdomen with the thorax. These sternal rods are composed of a free, anterior, apodemal part (sternal apodeme) and a longer posterior part which is merely a stronger sclerotization of the sternal cuticle (Fig. 2). In the Dichomerinae the structure of sternite 2 is rather different and no free apodemal appendages are developed.

In modern textbooks there exists some confusion over the terms 'apodeme' and 'apophysis'; both are applied to invaginations of the integument which form part of the endoskeleton and serve as muscle attachments. Snodgrass (1935 : 68) terms any cuticular ingrowth of the body wall *apodeme* while using *apophysis* for 'any tubercular or elongate process of the body wall, external or internal'. Kéler (1963 : 66) uses *apophysis* for all invaginations of the integument and restricts *apodeme* to apophyses of the pleural region. According to Chapman (1969 : 431, text-figs 284A, B) an *apodeme* is a hollow invagination of the integument while an *apophysis* is a solid one. Imms (1970 : 59) does not distinguish between *apodeme* and *apophysis* but applies the former to all individual parts of the endoskeleton.

In the Lepidoptera the free anterior appendages of sternite 2 developed undoubtedly as invaginations of the integument. In many instances it is hardly possible to decide whether the free anterior portion of the sternal rods is hollow or solid. The division of this structure into apodemes and apophyses on the basis of Chapman's definition is therefore not practical; it is not even desirable, as the application of different terms to the same structure implies principal differences which in fact do not exist. It seems sensible to refer to the free anterior (hollow or solid) appendages of sternite 2 uniformly as sternal apodemes.

A group of sensory setae (sensilla trichodea) is found on the posterior third of sternite 2 (Fig. 2). In live specimens these setae touch the metathorax and record the position of the abdomen in relation to the thorax. A pair of setae of similar function is normally found on the anterior margins of abdominal sternites 3–7 (8), where they are overlapped by the preceding segment and the intersegmental membrane. The group of sensilla on sternite 2 and the pairs on the following sternites are found widely in the Lepidoptera. In some genera of the Gelechiinae: Teleiodini an additional group of setae exists on the anterior margin of sternite 2 (Sattler, 1964 : 90, text-fig. 3).

The systematic position of *Deltophora*

Previously known *Deltophora* species were originally described in such collective genera as *Aristotelia* Hübner, *Gelechia* Hübner, *Teleia* Heinemann and *Xenolechia* Meyrick. Subsequently, Meyrick (1925) and Gaede (1937) placed some of the species (*atacta* Meyrick, *korbi* Caradja, *maculata* Staudinger and *peltosema* Lower) in *Aristotelia* Hübner (Aristoteliinae), others (*glandiferella* Zeller and *stictella* Rebel) in *Telphusa* Chambers (Gelechiinae: Teleiodini). The association of some species with genera of the Teleiodini (*Teleia* Heinemann, *Telphusa* Chambers and *Xenolechia* Meyrick) may have been based on wing venation. The hind wing vein M_1 is stalked with *RR* in the Teleiodini, whereas those veins are usually separate in the Aristoteliinae (for example, *Apodia* Heinemann, *Argolamprotes* Benander, *Aristotelia* Hübner, *Eulamprotes* Bradley, *Merimnetria* Walsingham, *Metzneria* Zeller, *Monochroa* Heinemann and *Paltodora* Meyrick). It is strange that Meyrick, who placed great emphasis on the systematic importance of the venation, associated most of the *Deltophora* species more correctly with *Aristotelia* against the apparent evidence of the venation. It seems that *glandiferella*, which he placed in *Telphusa*, was unknown to him at the time (specimens in his collection date from 1926) and that in placing it he

followed Busck (1903). Gaede's catalogue of 1937 is merely a compilation; he followed Meyrick (1925) in most instances and left subsequent species in the genera in which their respective authors had placed them. Spuler (1910 : 359) noticed the presence of ocelli in *maculata* and therefore excluded it from *Teleia*, without, however, assigning it to another genus.

When Janse (1950 : 121) described the genus *Deltophora* in his work on the South African Gelechiidae, he placed it between *Microsetia* Stephens and *Lanceopenna* Janse and compared it with *Aristotelia* Hübner, *Leuronoma* Meyrick, *Pyncostola* Meyrick, *Telphusa* Chambers and *Xenolechia* Meyrick.

Deltophora is here placed in the Aristoteliinae; it differs from all other genera of that subfamily by the stalked veins $RR+M_1$ of the hind wing. Within the Aristoteliinae it is placed next to *Monochroa* Heinemann with which it shares important characteristics of the abdominal structures of the male, for example, the anterior apodemes of the eighth sternite (Figs 3, 4, 6), the two pairs of coremata and the aedeagus with the lateral 'window' (Fig. 7).

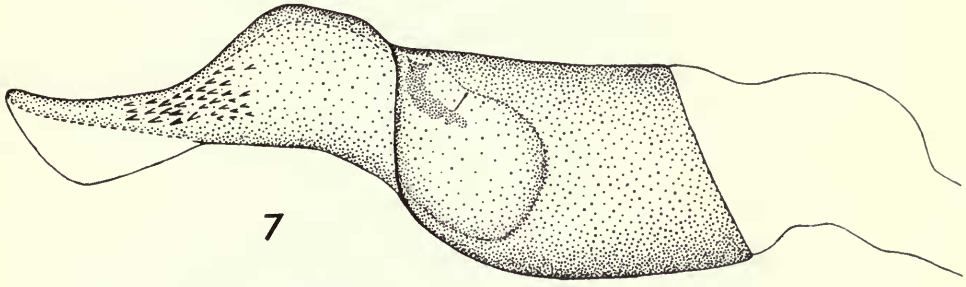


Fig. 7 *Monochroa divisella* (Douglas), ♂, aedeagus.

In the Aristoteliinae the eighth tergite and sternite of the male are laterally fused and not separated into free flaps as in the Gelechiinae. In *Deltophora* and *Monochroa* the eighth tergite is membranous but bears laterally a pair of narrow longitudinal sclerotizations (Fig. 5). The anterior margin of the eighth sternite of *Deltophora* bears a pair of long apodemes which extend anteriorly into the seventh segment (Fig. 6). In *Monochroa* such apophyses are absent in some species; in *conspersella* (Herrich-Schäffer), *tenebrella* (Hübner) (Fig. 3) and *tetragonella* (Stainton) a strengthening of the anterior margin is noticeable and small subtriangular processes are developed; in *rumicetella* (Hofmann) and *nomadella* (Zeller) (Fig. 4) short apodemes are present. A similar structure of the eighth abdominal segment is also found in the South American *Trichembola idiarcha* (Meyrick, 1931), which, in addition to the long apodemes of the eighth sternite, has another much shorter pair on the anterior margin of the seventh sternite (see Clarke, 1969, pl. 248, fig. 3c). In the Gelechiinae a short pair of apodemes is present on the anterior margin of the eighth abdominal sternite of '*Telphusa*' *inferialis* Meyrick, 1918. The eighth tergite bears a pair of coremata at its base and is not laterally fused with the sternite.

In many Aristoteliinae the aedeagus is plump and composed of a bulbous base with a narrower apical portion. In some genera (*Deltophora*, *Monochroa* and *Eulamprotes*) it is characterized by a lateral, slightly inflated 'window', which is less sclerotized than the surrounding area of the aedeagus wall (Fig. 7).

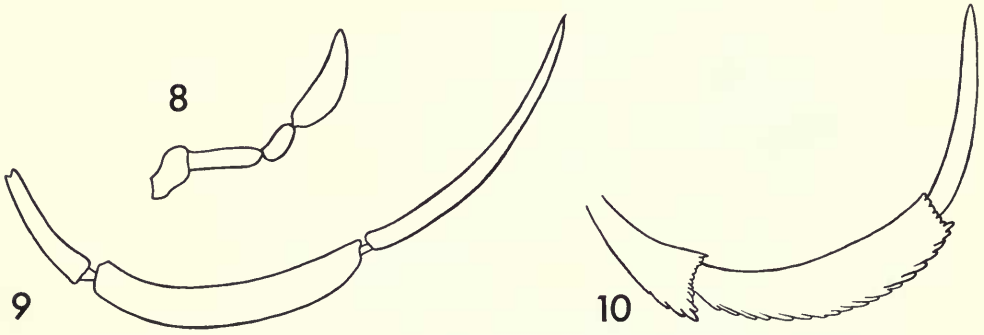
Deltophora differs from *Monochroa* (and other Aristoteliinae) by the presence of the basal section of vein R_1 and the stalking of RR with M_1 in the hind wing (Fig. 11), the presence of a well-developed, hook-like uncus in the male and the characteristic shape of the signum in the female.

DELTOPHORA Janse, 1950

Deltophora Janse, 1950, *Moths S. Afr.* **5** : 121; 1954, *ibidem* **5** : 449 [key]. Type-species: *Xenolechia peltosema* Lower sensu Janse, 1950 [= *Deltophora typica* sp. n.], by original designation and monotypy. *Deltophora* Janse; Sattler, 1973 : 191.

Frons convex, without processes or other modifications. Ocellus present. Mandible about three-quarters length of basal segment of labial palpus. Proboscis well developed, squamose at base, about as long as

labial palpus. Maxillary palpus (Fig. 8) with four segments. Labial palpus (Figs 9, 10) recurved, narrow, smoothly scaled; second segment without brush below; third segment about as long as second. Antenna shorter than fore wing, scape without pecten or single erect scale. Metascutum with paired group of narrow, hair-like scales. Venation (Fig. 11) of fore wing with veins R_4 and R_5 on common stalk; distance (at base) $R_1 - R_2$ equals $R_2 - R_3$; $R_{4+5} - M_1$ about half $M_1 - M_2$; cell between M_1 and M_2 open or closed. In hind wing veins RR and M_1 on common stalk of variable length, distance $RR+M_1 - M_2$ about twice distance $M_2 - M_3$; vein M_3 from lower angle of cell, separate from Cu_1. Frenulum of ♀ with three long setae. Humeral field (Fig. 11, H) on ventral surface of fore wing densely scaled, without microtrichia. Fore wing 3·5–7·5 mm, grey, grey-brown, ochreous or cream-coloured, with characteristic dark markings: spot in or on fold at about one-fifth to one-quarter (plical spot), often similar spots on costa and dorsal margin, forming incomplete transverse fascia; large spot in cell (discal spot) (Fig. 50), often extended to dorsal margin (Fig. 35) and rarely to costa as well (Fig. 42); small spot at end of cell, frequently extended to tornus; series of dark markings along costa; apical portion of wing sometimes darker than basal two-thirds; rarely wing markings reduced to three small spots in fold, cell and at end of cell (Fig. 51).



Figs 8–10 *Deltophora stictella* (Rebel), palpi. 8, maxillary palpus, denuded. 9, labial palpus, denuded. 10, labial palpus with scales.

Genitalia ♂ (Figs 65–83). Eighth tergite and sternite laterally fused, not separated into free flaps. Eighth tergite membranous, laterally with pair of narrow, sclerotized longitudinal bands (Fig. 5). Anterior margin of eighth sternite (Fig. 6) with pair of narrow apodemes which extend freely into seventh segment. Two pairs of coremata intersegmentally between eighth segment and genitalia (Figs 60–62): dense brushes of long, thin, hair-like scales in pair of membranous sacs which open laterally and extend deep into anterior segments of abdomen (in this paper referred to as 'anterior pair of coremata') and pair of ventro-lateral groups of shorter scales (here referred to as 'posterior pair of coremata'). Uncus usually a long simple hook, sometimes medially dilated and modified. Gnathos absent but weakly developed gnathos arms present in some species. Anterior margin of tegumen sometimes with deep characteristic emargination. Valva broad, sacculus large, clearly separated from valva or reduced and fused with valva. Anellus membranous, without specializations; in some species sclerotized juxta present. Saccus broad, about size of tegumen. Aedeagus (Figs 15, 16) ventrally sclerotized, dorsally membranous; basal portion inflated, bulbous; apical portion more extensively membranous, supported by ventral sclerotization or narrow rod on right-hand side. Sclerotization usually extends into ventral thorn or projection near apex. Vesica without cornuti. Anterior part of ductus ejaculatorius sometimes with large sclerotization (lamina) (Figs 71, 72).

Genitalia ♀ (Figs 84–113). Posterior margin of seventh segment sometimes with pair of sclerotized pleural pits (Figs 63, 64). Ovipositor with papilla analis elongate, weakly sclerotized; apophysis posterior about 1·5 times to 3 times length of apophysis anterior. Posterior margin of eighth segment with irregular row of widely spaced long setae. Eighth tergite medially membranous; apophysis anterior a short rod, as long as eighth segment. Eighth sternite medially membranous, often set densely with minute spines, anterior margin sclerotized. Ostium bursae in anterior half of eighth sternite; sometimes short sclerotized antrum present. Ductus bursae straight, narrow, evenly dilated from ostium to corpus bursae, rarely twice length of apophysis posterior. Narrow colliculum in posterior portion of ductus bursae near ostium; rarely sclerotization of colliculum extended (*minuta*) or ductus bursae with additional sclerotization (*duplicata*). Ductus seminalis starts at colliculum. Corpus bursae often clearly defined, sometimes transition between ductus and corpus bursae gradual. Inner surface of corpus bursae usually with minute

spines, sometimes only anterior half of corpus bursae spined; rarely spines extending into extreme anterior portion of ductus bursae. Signum always present, usually strong hook which is met at right angle by scobinate base plate; concave surface of hook serrate in apical portion; sometimes signum reduced to sclerotized plate.

Remarks. In the venation *Deltophora* is characterized by the stalked veins *RR* and M_1 of the hind wing. Their common stalk is variable in length; in some of the examined specimens it reaches nearly twice the length of the free end of M_1, although it is usually much shorter. In the holotype of *korbi* the veins *RR* and M_1 sit on a short common stalk in the right wing but are separate in the left wing. In the hind wing of most Lepidoptera vein R_1 is anastomozed with *Sc*. In the Gelechiidae the short section of R_1 which connects *RR* with *Sc* usually is distinctly developed.

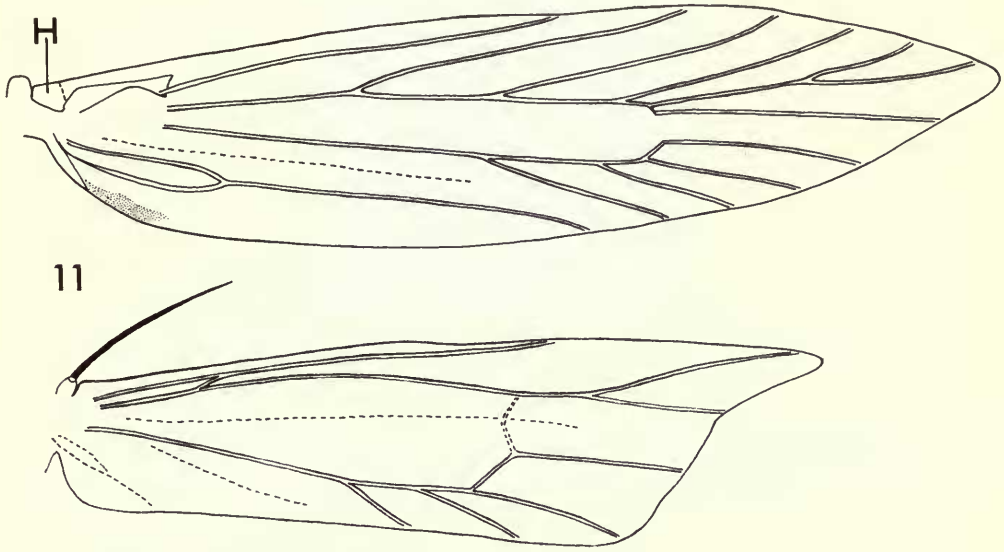


Fig. 11 *Deltophora stictella* (Rebel), ♂. Wing venation. (H – humeral field.)

This section of R_1 is clearly present in *Deltophora* (Fig. 11); however, it is absent in all other examined genera of the Aristoteliinae (*Apodia* Heinemann, *Argolamprotes* Benander, *Aristotelia* Hübner, *Eulamprotes* Bradley, *Merimnetria* Walsingham, *Metzneria* Zeller, *Monochroa* Heinemann, *Paltodora* Meyrick and *Ptocheuusa* Heinemann).

The fore wing pattern of *Deltophora* is very characteristic and is shared by all species, except *sella atacta* and some specimens of *sella californica* in which the dark markings are reduced; in *beatrix* the markings are extended to wide transverse bands.

In the ♂ of most *Deltophora* species the entire area of the eighth tergite between the narrow lateral sclerotizations is evenly set with scale bases. In the *flavocincta*-group the eighth tergite is specialized. The lateral margin is convex and the sclerotized zone is wider than in the other groups. The lateral part of the tergite is slightly raised, the raised zone tapered posteriorly. The scale bases are particularly dense on the posterior half of the tergite, between the raised zones and on their apices. There are few scale bases on the anterior half of the tergite; the anterior part of the sclerotized lateral zones is completely without. This extreme degree of specialization is reached in *duplicata* and *lanceella*; intermediate stages with scale bases concentrated in certain places are found in *flavocincta*, *caymana* and *minuta*.

The apodemes on the anterior margin of the eighth sternite vary in length individually and between species. They are usually about as long as the preceding sternite but can be slightly shorter or up to one-third longer.

The coremata, which probably play an important role during courtship or mating, are usually hidden inside abdominal sacs. Both pairs are occasionally found everted in dried museum speci-

mens; the anterior pair then protrudes as long white brushes (Fig. 12). The anterior pair reaches 2 to 3 times the length of the posterior pair; the length can vary in the same species. The scales of the posterior pair can be as narrow as those of the anterior pair but are usually much wider.

Fig. 12 *Deltophora typica* sp. n., ♂. Tuft of anterior pair of coremata.

In *duplicata* the anterior pair bears a group of strong, specialized scales, the longest of them with a characteristically curled apex (Figs 13, 62).

In some species of the *flavocincta*-group the uncus is inserted on the dorsum of the tegumen, not at its end. Rarely a weakly developed subscaphium is present (*flavocincta, lanceella*). In most

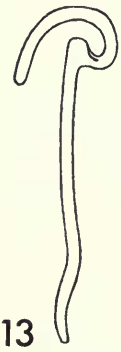


Fig. 13 *Deltophora duplicata* sp. n., ♂. Modified scale of anterior pair of coremata.

species the anterior margin of the tegumen is emarginate. The shape and depth of the emargination are variable within and between species. In *caymana* and *minuta* the emargination is particularly deep and divides nearly the entire tegumen.

The aedeagus is divided into a bulbous base and a much narrower apical portion. The inflated basal portion is sclerotized, with the exception of a narrow dorsal zone which is membranous. The largely membranous apical portion is supported by a narrow, longitudinal, lateral or ventral, sclerotization which may be extended below the apex into a transverse ridge, thorn or pair of thorns. In the species of the *maculata*-group (*maculata, beatrix*) the anterior part of the ductus ejaculatorius bears a large sclerotization (lamina ducti ejaculatorii).

The description of the penis structure in Klots (1956 : 102) is incomplete; the illustrations (Figs 121, 123) are nebulous with regard to bulbus and ductus ejaculatorius. The bulbus ejaculatorius is not mentioned in the text. In the glossary (p. 191) it is defined as 'Distal part of ductus ejaculatorius, cephalad of the sclerotized aedeagus'; however, the term bulbus ejaculatorius should be restricted to the anterior portion of the penis, which forms a membranous sheath around the anterior portion of the proper ductus ejaculatorius. In the Gelechiidae the anterior part of the ductus ejaculatorius sometimes bears a sclerotization, here termed lamina ducti ejaculatorii, which can be of taxonomic importance (Fig. 14).

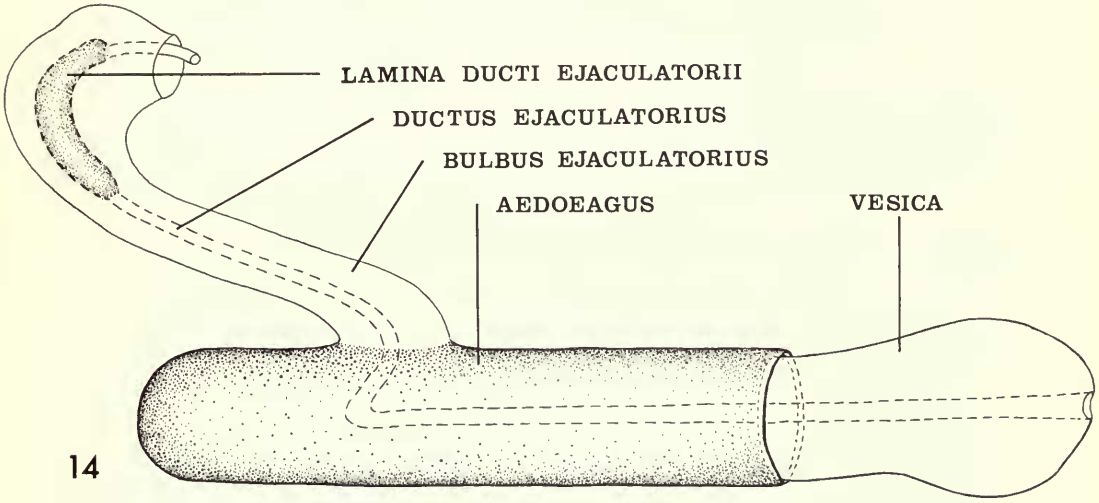


Fig. 14 Schematic diagram of gelechioid aedeagus.

In the ♀ of some species (*maculata*, *pauperella*, *glandiferella*, *minuta*) a pair of pleural pits is developed on the posterior margin of the seventh abdominal segment (Figs 63, 64). In some species of the *flavocincta*-group the pleural region shows a denser than usual concentration of scale bases; however, where this region is invaginated to pleural pits it is devoid of scales.

The bursa copulatrix is usually divided into ductus and corpus bursae; occasionally the bursa copulatrix widens directly from the colliculum and there is no separation into ductus and corpus bursae. The posterior part of the ductus bursae, between colliculum and ostium bursae, is usually dilated, funnel-shaped, and can be membranous or sclerotized. It is referred to as antrum if it is in any way specialized (dilated or sclerotized). The ductus bursae between colliculum and corpus bursae is usually straight; in *flavocincta* it has one loop in the middle. In the systematic part of this paper the length of the ductus bursae is compared with that of the apophyses posteriores. As the length of both structures is variable, the proportions given are approximate. The minute spines on the inner surface of the corpus bursae are sometimes difficult to see. It is therefore recommended to stain the genitalia, sever the intersegmental membrane between abdominal segments seven and eight and remove the bursa copulatrix from the abdomen. The practice of leaving the bursa copulatrix inside the abdomen may be more convenient for the preparator; it is, however, less satisfactory.

The type-species of *Deltophora*, *Xenolechia peltosema* Lower sensu Janse, 1950, is a misidentification. Under the *International Code of Zoological Nomenclature*, Article 70(a), the case of a misidentified type-species has to be referred to the International Commission on Zoological Nomenclature. The nominal species cited by Janse and the one actually involved are congeneric and closely allied. In view of Janse's detailed description and illustrations, which clearly permit identification, the Commission should be asked to designate formally as the type-species of *Deltophora* Janse, 1950, the nominal species actually involved, *Deltophora typica* sp. n.

BIOLOGY. Host-plants unknown. Based on the incorrect assumption that *peltosema* is a widely distributed species (Australia, India, Africa, South America), Meyrick suspected it to be 'attached to some garden plant' (Meyrick, 1908 : 724) and 'carried by man with some cultivated plant' (Meyrick, 1931 : 278). Most Aristoteliinae are internal feeders. The larvae of *Metzneria* Zeller, *Isophrictis* Meyrick, *Apodia* Heinemann and others live in the seed heads of Compositae. The larvae of *Monochroa* Heinemann, the genus closest to *Deltophora*, are leaf miners or stem and root borers on Cyperaceae, Polygonaceae, Rosaceae and Primulaceae. It seems probable that the *Deltophora* larvae are also internal feeders; however, at this stage no possible host-plant families can be suggested.

Little is known about the habits of the moths; they are nocturnal and are readily attracted to light. In southern Africa moths of *typica* were collected throughout the year; in areas with more extreme seasons one or two clear-cut generations per year can be expected.

DISTRIBUTION. The genus *Deltophora* is distributed from the tropical to the temperate zones, between 50° N and 30° S, in all the major zoogeographical regions (Palaearctic, Ethiopian, Oriental, Australian, Nearctic and Neotropical). The distribution of individual species is much more limited, with each region having its own species.

Key to the species of *Deltophora*: males

(*Note*. The males of *pauperella* and *suffusella* are unknown.)

1		Uncus a slender hook, simple	2
–		Uncus distinctly dilated medially	15
2	(1)	Valva with two digitate processes (Fig. 80)	***duplicata*** (p. 301)
–		Valva without digitate processes	3
3	(2)	Sacculus large, clearly separated from valva	4
–		Sacculus small, not separated from valva.	10
4	(3)	Sacculus tapered, pointed, almost as long as valva; uncus longer than tegumen (Figs 66, 67)	5
–		Sacculus broad, distinctly shorter than valva; uncus not longer than tegumen	6
5	(4)	Apical portion of aedeagus evenly curved (Fig. 67)	***angulella*** (p. 279)
–		Apical portion of aedeagus with distinct ventral projection (Fig. 66)	***diversella*** (p. 278)
6	(4)	Saccus more or less pointed	7
–		Saccus rounded or truncate (Figs 69, 70)	9
7	(6)	Distal margin of sacculus setose; sclerotized juxta present (Fig. 79)	***flavocincta*** (p. 300)
–		Ventral margin of sacculus setose; juxta absent (Figs 65, 68)	8
8	(7)	Ventral margin of sacculus straight or concave; apex of aedeagus blunt (Fig. 65)	***typica*** (p. 276)
–		Ventral margin of sacculus convex; apex of aedeagus with sharp ventral thorn (Fig. 68)	***peltosema*** (p. 279)
9	(6)	Distal margin of valva straight (Fig. 69)	***distinctella*** (p. 281)
–		Distal margin of valva concave (Fig. 70)	***fasciella*** (p. 282)
10	(3)	Valva strongly constricted medially; costal margin concave (Figs 28, 73)	***stictella*** (p. 289)
–		Valva medially not constricted; costal margin straight	11
11	(10)	Costal and ventral margin of valva almost parallel; distal margin concave (Figs 30, 74)	***korbi*** (p. 291)
–		Valva distally rounded, ventral margin angled (Figs 75–78).	12
12	(11)	Ventral angle of valva with sharp point (Figs 75–77).	13
–		Ventral angle of valva with rectangular sclerotization (Figs 34, 78)	***glandiferella*** (p. 297)
13	(12)	Fore wing with large dark discal spot (Figs 50, 52)	14
–		Fore wing unmarked or only with minute dark spots (Fig. 51)	***sella atacta*** (p. 296)
14	(13)	Discal spot of fore wing reaches dorsal margin (Fig. 52)	***sella californica*** (p. 297)
–		Discal spot of fore wing not reaching dorsal margin (Fig. 50)	***sella sella*** (p. 294)
15	(1)	Apex of uncus blunt (Figs 17–26, 71, 72); anterior part of ductus ejaculatorius with large sclerotized lamina (Figs 71, 72)	16
–		Uncus pointed; ductus ejaculatorius without sclerotization	17
16	(15)	Uncus strongly dilated near middle (Figs 17–26); valva widest near middle (Fig. 71)	***maculata*** (p. 283)
–		Uncus widest near base, gently tapered posteriorly; valva widest at distal quarter (Fig. 72)	***beatrix*** (p. 287)

17 (15) Base of valva with sclerotized process (Figs 81, 83) 18
– Base of valva without process 19
18 (17) Valva tapered (Fig. 81) . . . . . ***lanceella*** (p. 302)
– Margins of valva parallel (Fig. 83) . . . . . ***minuta*** (p. 304)
19 (17) Uncus broad, leaf-shaped (Fig. 82) . . . . . ***caymana*** (p. 303)
– Uncus narrow (Fig. 79). . . . . ***flavocincta*** (p. 300)

Key to the species of *Deltophora*: females

(*Note*. The females of *angulella*, *beatrix*, *korbi* and *caymana* are unknown).

1 Signum strongly curved, hook-like (Figs 84–90, 101, 102, 105–108, 112, 113) . . 2
– Signum neither hook-like nor curved 10
2 (1) Ductus bursae with sclerotization anterior to colliculum (Figs 105, 111) . . . 3
– Ductus bursae membranous except for narrow colliculum 4
3 (2) Eighth segment with ventral pair of large, ear-like lobes (Fig. 111) . . ***suffusella*** (p. 304)
– Ventral surface of eighth segment without lobes (Fig. 105) . . . ***duplicata*** (p. 301)
4 (2) Apical part of signum compressed, much longer than basal part (Figs 107, 108) ***lanceella*** (p. 302)
– Apical part of signum circular in cross-section, not longer than basal part (Figs 84–90, 101, 102) 5
5 (4) Apophyses anteriores bent at base, inserted medially near ostium bursae (Fig. 101) ***glandiferella*** (p. 297)
– Apophyses anteriores straight, inserted laterally on eighth segment 6
6 (5) Ventral margin of ostium bursae with deep median emargination and pair of lateral folds (Fig. 85) . . . . . ***diversella*** (p. 278)
– Ostium bursae without lateral folds 7
7 (6) Ostium bursae almost as wide as eighth sternite (Figs 87, 88) 8
– Ostium bursae much narrower than eighth segment (Figs 84, 90) 9
8 (7) Ventral margin of ostium bursae medially concave (Fig. 87) . . . ***peltosema*** (p. 279)
– Ventral margin of ostium bursae posteriorly straight or slightly convex (Fig. 88) ***distinctella*** (p. 281)
9 (7) Discal spot of fore wing extended from costa to dorsal margin (Figs 41, 42). ***fasciella*** (p. 282)
– Discal spot of fore wing not reaching costa (Figs 35, 36) . . . . ***typica*** (p. 276)
10 (1) Ductus bursae with long sclerotization from colliculum (Fig. 109) . . ***minuta*** (p. 304)
– Ductus bursae without sclerotization except for colliculum 11
11 (10) Posterior margin of seventh abdominal segment with pair of sclerotized pleural pits (Fig. 63) 12
– Seventh abdominal segment without pleural pits 13
12 (11) Ventral margin of ostium bursae concave (Fig. 95) . . . . . ***pauperella*** (p. 288)
– Ventral margin of ostium bursae with subtriangular extension (Figs 91–94) . ***maculata*** (p. 283)
13 (11) Signum a strong straight spine (Figs 98–100) 14
– Signum not a straight spine 16
14 (13) Fore wing with large discal spot (Figs 50, 52) 15
– Fore wing unmarked or only with minute dark spots (Fig. 51) . . ***sella atacta*** (p. 296)
15 (14) Discal spot of fore wing reaches dorsal margin (Fig. 52) . . ***sella californica*** (p. 297)
– Discal spot of fore wing not reaching dorsal margin (Fig. 50) . . . ***sella sella*** (p. 294)
16 (13) Ventral margin of ostium bursae posteriorly convex; signum a deep invagination at entrance of corpus bursae (Figs 29, 96, 97) . . . . . ***stictella*** (p. 289)
– Ventral margin of ostium bursae concave; signum a slightly curved, compressed blade with broad base (Figs 103, 104) . . . . . ***flavocincta*** (p. 300)

Check-list of the species of *Deltophora*

DELTOPHORA Janse, 1950

***peltosema*-group**
***typica* sp. n.**
***diversella* sp. n.**
***angulella* sp. n.**

peltosema (Lower, 1900)
pyramidophora Turner, 1919
***distinctella* sp. n.**
***fasciella* sp. n.**

maculata-group
maculata (Staudinger, 1879), **comb. n.**
***beatrix* sp. n.**
***pauperella* sp. n.**

stictella-group
stictella (Rebel, 1927), **comb. n.**

korbi-group
korbi (Caradja, 1920), **comb. n.**

glandiferella-group
sella sella (Chambers, 1874), **sp. rev., comb. n.**
sella atacta (Meyrick, 1927), **stat. n., comb. n.**
***sella californica* subsp. n.**
glandiferella (Zeller, 1873), **comb. n.**

flavocincta-group
***flavocincta* sp. n.**
***duplicata* sp. n.**
***lanceella* sp. n.**
***caymana* sp. n.**
***minuta* sp. n.**
***suffusella* sp. n.**

The *peltosema*-group

GENITALIA ♂. Uncus hook simple. Valva distally dilated, with ventral point. Sacculus well developed, separated from valva by deep incision. Juxta absent. Ductus ejaculatorius without sclerotized lamina.

GENITALIA ♀. Posterior margin of seventh abdominal segment without pleural pits. Antrum sclerotized or membranous. Inner surface of corpus bursae with minute spines. Signum of typical shape: strong hook, concave surface serrate; scobinate base plate branches off basal third.

DISTRIBUTION. Africa; S.W. Asia; Australia.

Deltophora typica sp. n.

(Figs 12, 35, 36, 65, 84)

[*Aristotelia peltosema* (Lower); Meyrick, 1908 : 724 (partim). Misidentification.]
[*Aristotelia peltosema* (Lower); Janse, 1917 : 178. Misidentification.]
[*Deltophora peltosema* (Lower) Janse, 1950 : 119, 122, pl. 51, fig. 12, pl. 55, fig. 5, pl. 56, fig. 2, pl. 57, figs 3, 4, pl. 58, figs 2, 3, 8, pl. 59, fig. 2. Misidentification.]

♂, ♀. 4·5–5·5 mm. Head ochreous, some dark brown scales on margin of eye between bases of proboscis and antenna. Labial palpus pale ochreous; outer surface of basal segment with some dark scales on apex; second segment with incomplete dark brown rings near base and before apex; third segment with dark apex and dark brown ring around middle. Antenna brown, with lighter rings above. Thorax ochreous, posterior half to varying degree dark brown. Tegula ochreous, with dark brown base. Fore wing ochreous, with dark brown markings: series of fine markings on costa; some dark scales near base of dorsal margin; plical spot at one-quarter, triangularly extended to dorsal margin; discal spot extended to dorsal margin; small spot at end of cell. Apex of fore wing sometimes with darker scales.

GENITALIA ♂ (Fig. 65). Uncus hook simple, as long as tegumen. Anterior margin of tegumen medially with deep tapered emargination. Valva distally dilated; costal margin with obtuse angle at one-third, distal two-thirds straight; distal margin slightly convex, at right angles to costa; distal part of valva extended ventrad to form broad apex. Sacculus separated from valva by deep emargination, broad, subtriangular, ventral margin straight, setose. Saccus rounded, about one-third size of tegumen. Basal two-

thirds of aedeagus inflated, sclerotized; apical third narrower, membranous, supported by narrow lateral sclerotization; apex with small ventral projection. Ductus ejaculatorius without sclerotized lamina.

GENITALIA ♀ (Fig. 84). Apophysis posterior about 1·5 times length of apophysis anterior. Eighth sternite membranous, densely set with minute spines, narrow zone on anterior margin sclerotized; anterior margin convex. Ostium bursae near anterior end of eighth sternite, about one-third width of sternite, ventral margin slightly concave. Antrum a short sclerotized pouch, anteriorly rounded. Narrow colliculum touches antrum. Ductus bursae about twice length of apophysis posterior, at entrance of corpus bursae twice as wide as at colliculum. Corpus bursae spherical, inner surface with minute spines which extend into extreme anterior portion of ductus bursae. Signum in anterior part of corpus bursae, a strong hook, concave surface of apical portion serrate; base plate elongate, scobinate.

REMARKS. *D. typica* is externally similar to *diversella* which sometimes occurs in the same areas. In *typica* the dark dorsal spot at the basal quarter of the fore wing is more strongly developed than in *diversella*; the latter has a distinct dark mark at the third quarter of the costa, whereas in *typica* there is at best a weak shadow. The genitalia of *typica* differ from those of *diversella* by the shorter uncus, the broad valva and sacculus and the simple apex of the aedeagus of the ♂ and by the simple structure of the ostium in the ♀.

The ♂ and ♀ genitalia are similar to those of *peltosema*, *distinctella* and *fasciella*. In the *peltosema* ♂ the valva is much narrower, the ventral margin of the sacculus is convex and the apex of the aedeagus bears a distinct ventral spine; in the ♀ the ostium bursae is about as wide as the eighth sternite and has a distinct median emargination. In the *distinctella* ♂ the distal part of the valva is twice as wide as its narrowest part near the middle (only about 1·5 times in *typica*), the sacculus is distally rounded or truncate (not pointed) and the aedeagus bears a big ventral thorn below the apex; in the ♀ the ostium bursae is as wide as the eighth sternite and leads into a large antrum. In the *fasciella* ♂ the ventro-distal corner of the valva is extended into a short robust point, the sacculus is distally rounded and the apex of the aedeagus bears a strong ventral point; in the ♀ the antrum is membranous, the signum is big and arises in the posterior part of the corpus bursae.

In Nigeria *typica* was first found by Medler in 1970 and 1973 and subsequently by Deeming in 1975. The absence of this species in their earlier collections could indicate that it is a recent accidental introduction in that country. However, after completion of this manuscript I have seen a specimen of another, as yet unidentified, species from Ghana, so that in all probability the genus *Deltophora* occurs naturally in the West African fauna.

The collecting sites of the British Museum (Natural History) Southern African Expedition are identified by a number on the data labels of the specimens. Photographic records and detailed information on these sites are available in the diaries of the members of the expedition. The site number is recorded below under 'Material examined'.

I was unable to trace some of the localities on the data labels of specimens in the Transvaal Museum. Most of them may be the names of farms in the Transvaal.

BIOLOGY. Host-plant unknown. In southern Africa the moths appear to fly throughout the year. In Nigeria moths have been collected in January and October.

DISTRIBUTION. Nigeria; South West Africa; South Africa; Rhodesia; Mozambique.

MATERIAL EXAMINED.

Holotype ♂, **South Africa**: Natal, Weenen, Eastcourt, Kimbolton, 1892 (*Hutchinson*) (genitalia slide no. 14 849; BMNH).

Paratypes. **Nigeria**: 1 ♀, N. Nigeria, Zaria, Samaru, 17.x.1975 (*Deeming*) (IAR, Samaru); 1 ♂, 1 ♀, Western State, Ile-Ife, 15.i.1970, 27.i.1973 (*Medler*) (BMNH). **South West Africa**: 13 ♂, 5 ♀, Abachaus, [260 km N. of Windhoek,] xii.1942, i-vii.1943, ii, xii.1944 (*Hobohm*) (TM, Pretoria; BMNH); 2 ♀, Kahn River, 8 km ('5 miles') N. of Usakos, at light, 30–31.i.1972 (*BMNH Sth. Afr. Exped.*, no. 29) (BMNH). **South Africa**: 1 ♂, Eastern Cape Province, Kei River Bridge, 5–6.ii.1955 (*Janse*) (TM, Pretoria); 2 ♂, Natal, Weenen, Eastcourt, 1892, 1895 (*Hutchinson*) (BMNH); 1 ♂, Natal, near Ladysmith, xii.1931 (*Janse*) (TM, Pretoria); 1 ♂, Natal, Colenso, 27.iii.1902 (collector unknown) (TM, Pretoria); 4 ♂, Transvaal, Pietersburg, Naawport, 22, 27.xi.1927 (*van Son*) (TM, Pretoria); 2 ♂, Transvaal, [N. Pretoria,] Naboomspruit, 8, 10.i.1927 (*van Son*) (TM, Pretoria); 30 ♂, 5 ♀, Transvaal, North Pretoria, 12.ii.1914–

4.ii.1918 (*Swierstra*) (TM, Pretoria; BMNH); 17 ♂, 6 ♀, Transvaal, Pretoria, 21.viii.1906–20.v.1924, 2.ix.1948, 5.iv.1949 (*Burger*; *J.G.*; *Janse*; *Swierstra*; *van Son*; *Vári*) (TM, Pretoria); 4 ♂, Transvaal, Pretoria, Zoutpan, 4–10.ii.1929 (*van Son*) (TM, Pretoria); 2 ♂, Transvaal, [Pilgrims Rest:] Marieps Mnt., 7.xii.1925 (*van Son*) (TM, Pretoria); 1 ♀, Transvaal, Pilgrims Rest, 12.xii.1920 (*Skea*); 3 ♂, 1 ♀, Transvaal, [Kruger National Park,] Satara, 27.iii.1952 (*Janse & Vári*) (TM, Pretoria); 1 ♂, [? Transvaal,] Tweefontein, 31.i.1907 (collector unknown) (TM, Pretoria); 2 ♂, [? Transvaal,] Modderpoort, 18.xii.1924 (*Janse*) (TM, Pretoria); 1 ♂, [? Transvaal,] Buffelspoort, 15.xii.1924 (*Janse*) (TM, Pretoria); 2 ♂, [? Transvaal,] Blauwkop, 30.i.1925 (*Janse*) (TM, Pretoria). **Rhodesia**: 2 ♂, Bulawayo, 15–23.xii.1919 (*Janse*) (TM, Pretoria); 1 ♂, Victoria Falls Road, 61 km ('38 miles') from Bulawayo, 25–26.iv.1954 (*Janse*) (TM, Pretoria); 1 ♂ 6·5 km ('4 miles') NE. of Beit Bridge, 29–30.iii.1954 (*Janse*) (TM, Pretoria). **Mozambique**: 1 ♂, Bela Vista, xi.1916 (*Swierstra*) (TM, Pretoria).

Deltophora diversella sp. n.

(Figs 37, 66, 85, 86)

♂, ♀. 5·0–6.5 mm. Head light brown or ochreous, some dark brown scales on margin of eye between base of antenna and proboscis. Labial palpus whitish with brown markings: outer surface of basal segment with dark scales on apex; second segment with dark scales on outer surface near base and dark ring around apical third; third segment with dark apex and broad ring around middle. Antenna dark brown with lighter rings above. Thorax as head, middle darker brown, mesoscutellum with pair of lateral spots and dark apex. Tegula light brown or ochreous, with dark base. Fore wing grey-brown to ochreous, with dark brown markings: some fine markings along proximal half, a dark shadow in third quarter of costa; plical spot at one-fifth, extended to dorsal margin, extension sometimes indistinct; discal spot triangularly extended to dorsal margin; small spot at end of cell, sometimes with shadow to tornus. Apical portion of wing speckled with darker scales.

Genitalia ♂ (Fig. 66). Uncus hook longer than tegumen, simple, slender. Anterior margin of tegumen with wide emargination. Costal margin of valva with obtuse angle at about one-half; distal half of valva narrow, widest at about three-quarters; distal margin straight, at obtuse angle to costa. Sacculus separated from valva by wide emargination, broad at base, tapered, almost as long as valva; ventral margin straight, setose. Saccus broad, as large as tegumen. Basal half of aedeagus inflated, apical half membranous, supported by narrow lateral sclerotization, with broad ventral projection. Ductus ejaculatorius without sclerotized lamina.

Genitalia ♀ (Figs 85, 86). Apophysis posterior nearly 3 times length of apophysis anterior. Middle and posterior part of eighth sternite membranous, with minute spines, anterior part sclerotized, anterior margin strongly convex in middle. Sclerotized fold around ventral margin of ostium bursae with deep median emargination. Posterior part of ductus bursae not dilated to antrum. Colliculum close to ostium bursae. Ductus bursae about 1·5 times length of apophysis posterior, at entrance of corpus bursae about twice as wide as at colliculum. Corpus bursae elongate, anterior two-thirds with minute spines. Signum a sturdy hook, inner surface serrate, base plate elongate, scobinate.

Remarks. The scales on the head and thorax of the available specimens are more or less rubbed, the above description is therefore incomplete. A ♀ from Uganda is slightly larger (6·0 mm) than the specimens from Kenya; its head shows a dark longitudinal line on vertex and frons.

The ♂ genitalia of *diversella* share with those of *angulella* the long uncus, narrow valva and long tapered sacculus; however, *angulella* differs by the distinct costal hump and truncate apex of the valva and the absence of a ventral projection on the apex of the aedeagus. Externally *diversella* differs from *angulella* by the smaller size and the fore wing markings, particularly the shape of the discal spot. *D. diversella* is externally very similar to *typica* with which its distribution overlaps; determinations based on external characters alone are not always reliable. For differences between *diversella* and *typica* see p. 277.

Biology. Host-plant unknown. Moths have been collected in January, May, September and October.

Distribution. South Africa (N. Transvaal); S. Mozambique; Kenya; Uganda.

Material examined.

Holotype ♂, **Kenya**: Kikuyu, Ibea, Escarpment, 2300–2600 m ('7500–8500 feet'), ix–x.1900 (*Doherty*) (genitalia slide no. 14 838; BMNH).

Paratypes. **South Africa**: 1 ♀, N. Transvaal, Wyl[l]ie's Poort, 31.i.1925 (*Janse*) (TM, Pretoria). **Mozambique**: 1 ♀, S. Mozambique, Magude, x.1910 (*Swierstra*) (TM, Pretoria). **Kenya**: 9 ♂, 1 ♀, Kikuyu, Ibea, Escarpment, 2300–2600 m ('7500–8500 feet'), ix–x.1900 (*Doherty*) (BMNH). **Uganda**: 1 ♀, Kampala, 22.v.1934 (*Hargreaves*) (BMNH).

Deltophora angulella sp. n.

(Figs 38, 67)

♂. 7·0 mm. Antenna brown, with lighter rings above. Fore wing grey-brown with dark brown markings: dark shadow on second third of costa; small plical spot at about one-fifth; discal spot extended to dorsal margin, triangular, proximal margin of spot meets dorsal margin of wing at right angles; small spot at end of cell.

GENITALIA ♂ (Fig. 67). Uncus hook longer than tegumen, simple, slender, apex blunt. Anterior margin of tegumen emarginate to one-half. Valva narrow, apical portion slightly dilated, truncate; costa with rounded projection at three-quarters. Sacculus triangular, almost as long as valva. Raised group of setae near place where valva and sacculus separate. Saccus almost as large as tegumen. Aedeagus as long as uncus plus tegumen; basal third inflated, sclerotized; apical two-thirds membranous, supported by narrow, lateral, sclerotized rod; apex slightly curved ventrad.

GENITALIA ♀. Unknown.

REMARKS. The head and thorax of the only specimen are rubbed, some dark scales are visible on the margin of the eyes, between the base of the antenna and the proboscis. The second and third segments of the labial palpi are missing; there are some dark scales on the outer surface of the basal segment.

D. angulella is distinguished from *diversella*, which occurs in the same area, by its larger size, the costal hump and the dilated apex of the valva and the long, membranous, apical portion of the aedeagus which lacks a ventral projection below the apex.

BIOLOGY. Host-plant unknown. The only moth has been collected by Doherty in September–October.

DISTRIBUTION. Kenya.

MATERIAL EXAMINED.
Holotype ♂, **Kenya**: Kikuyu, Ibea, Escarpment, 2300–2600 m ('7500–8500 feet'), ix–x.1900 (*Doherty*) (genitalia slide no. 14 828; BMNH).

Deltophora peltosema (Lower, 1900)

(Figs 15, 39, 68, 87)

Xenolechia peltosema Lower, 1900, *Proc. Linn. Soc. N.S.W.* **25** : 50. Holotype ♀, AUSTRALIA: New South Wales, Broken Hill, 15.x.1898 (*Lower*) (SAM, Adelaide) [not examined].
Aristotelia peltosema (Lower) Meyrick, 1904 : 291.
Aristotelia peltosema (Lower); Meyrick, 1906 : 138.
Gelechia pyramidophora Turner, 1919, *Proc. R. Soc. Qd* **31** : 123. Holotype ♂, AUSTRALIA: Queensland, Adavale, iv.1904 (*Turner*) (genitalia slide no. 615c, Sattler; ANIC, Canberra) [examined]. [Synonymized by Meyrick, 1925 : 47.]
Gelechia pyramidophora Turner; Turner, 1921 : 47.
Aristotelia peltosema (Lower); Meyrick, 1925 : 47 (partim).

♂, ♀. 5·0–5·5 mm. Head ochreous, speckled with brown, particularly on vertex. Labial palpus pale ochreous with brown markings: basal segment brown on outer surface; second segment mostly brown, light at base, before middle and at apex; third segment with dark ring below middle and dark apex. Antenna brown with lighter rings above. Thorax ochreous or light brown, with pair of dark lateral spots and dark apex of mesoscutellum; sometimes anterior part of thorax speckled with dark brown. Tegula ochreous with dark brown base. Fore wing grey-brown to ochreous, with mostly indistinct dark brown markings; costa with some weak markings in basal half and dark shadow in third quarter; plical spot indistinct, extended to dorsal margin; discal spot more distinct, lined with ochreous, extended to dorsal

margin; spot at end of cell small or absent; indistinct dark shadow between tornus and end of cell; apical quarter of wing sometimes with darker scales.

GENITALIA ♂ (Figs 15, 68). Uncus hook simple, as long as tegumen. Anterior margin of tegumen evenly concave, without median emargination. Valva distally dilated; costal margin gently curved near base, distal three-quarters straight; distal margin at right angles to costa; distal part of valva extended ventrad to form strong apex. Sacculus separated from valva by deep emargination, subtriangular, ventral margin curved, setose. Saccus rounded, about half size of tegumen. Basal half of aedeagus inflated, sclerotized; apical half narrower, membranous, supported by narrow lateral sclerotization; sharp ventral thorn below apex. Ductus ejaculatorius without sclerotized lamina.

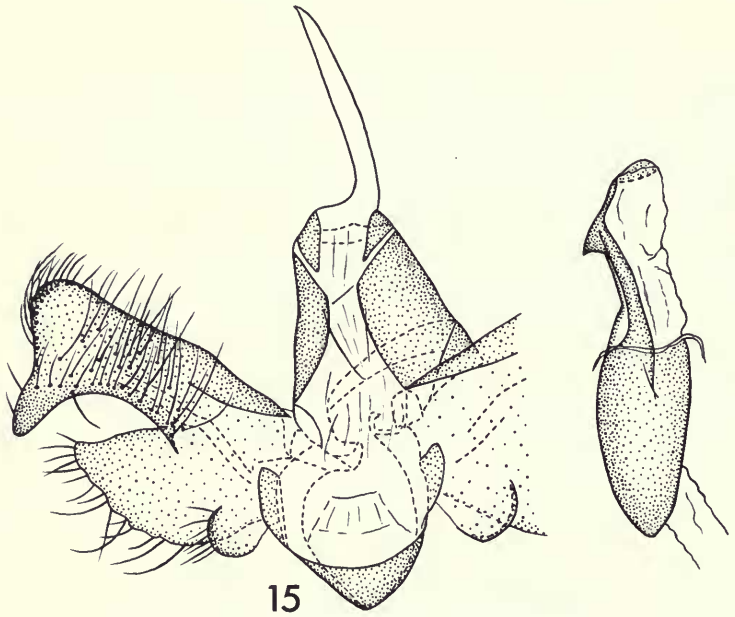


Fig. 15 *Deltophora peltosema* (Lower), ♂. Genitalia of synonym *Gelechia pyramidophora* Turner, holotype (genitalia slide no. 415d, Sattler; ANIC, Canberra).

GENITALIA ♀ (Fig. 87). Apophysis posterior about twice length of apophysis anterior. Eighth sternite membranous, anterior margin in front of ostium bursae weakly sclerotized, convex. Antrum a broad funnel, ventral margin medially emarginate. Colliculum touches antrum. Ductus bursae twice length of apophysis posterior, at entrance of corpus bursae about twice as wide as at colliculum. Corpus bursae oval, inner surface with minute spines which extend into extreme anterior portion of ductus bursae. Signum near middle of corpus bursae, a strong hook, concave surface of apical half serrate; base plate elongate, scobinate.

REMARKS. *D. peltosema* is externally similar to the African *typica* and *diversella*; however, their ranges of distribution do not overlap. *D. distinctella* from India differs by the more distinct dark markings of the fore wing, particularly the large spot at the end of the cell. The ♂ genitalia of *peltosema* resemble those of *typica*, *distinctella* and *fasciella* but differ by the distinct ventral spine on the apex of the aedeagus (for further differences see *typica*, p. 277). The ♀ genitalia differ from those of the above species by the wide ostium bursae and the median emargination of its ventral margin.

X. peltosema Lower was described from a single ♀. The holotype is partly damaged and has lost its head and abdomen. A photograph of the holotype, received together with additional information on the specimen from Mr A. N. MacFarland of the South Australian Museum, has satisfied me that this species is correctly identified.

BIOLOGY. Host-plant unknown. Meyrick's suggestion that *peltosema* might have been dispersed by man with some cultivated plant was based on the erroneous assumption that it is a widely distributed species (Australia, India, Africa, South America) (Meyrick, 1908 : 724; 1931 : 278). Moths have been collected in September–April.

DISTRIBUTION. India; Ceylon; Australia (Western Australia, Queensland, New South Wales).

Several authors have erroneously recorded *peltosema* from South Africa and South America. Re-examination of the material concerned has revealed the following misidentifications: South Africa (Meyrick, 1908 : 724; 1925 : 47; Janse, 1917 : 178; 1950 : 122; Gaede, 1937 : 69) – *typica* sp. n.; South America (Meyrick, 1925 : 47; 1931 : 278; Gaede, 1937 : 69) – *lanceella* sp. n., *minuta* sp. n., *suffusella* sp. n.

MATERIAL EXAMINED.

India: 1 ♂, Hoshangabad, 17.ii.1912 (*Fletcher*) (BMNH); 1 ♂, Bihar, Pusa, 27.iv.1929 (*Sontakay*) (BMNH); 1 ♀, Kanara, Dharwar, 13.iii.1916 (*Maxwell*) (BMNH). **Ceylon**: 1 ♂, 1 ♀, Puttalam, 189[?] (*Pole*) (BMNH); 3 ♂, 2 ♀, Puttalam, ix, x, xii.1904 (*Pole*) (BMNH); 1 ♀, Weligama, 16.i.1908 (*Fletcher*) (BMNH). **Australia**: 1 ♂, 1 ♀, Western Australia, Geraldton, 8, 11.xi.1886 (*Meyrick*) (BMNH); 1 ♂, N. Queensland, Townsville, 25.vi.1900 (*Dodd*) (BMNH).

Deltophora distinctella sp. n.

(Figs 40, 69, 88, 89)

♂, ♀. 5·5–6·5 mm. Head light brown or ochreous, speckled with darker brown. Labial palpus whitish, with brown markings: outer surface of basal segment brown; second segment with broad rings at base and behind middle; third segment with ring before middle and dark apex. Antenna dark brown with paler rings above. Thorax as head, mesoscutellum with pair of lateral spots and dark apex. Tegula ochreous or light brown, with dark base. Fore wing light grey-brown with distinct dark brown markings: costa with dark markings at base, one-quarter, one-third and dark shadow in distal half, interrupted by whitish mark at three-quarters; plical spot at one-quarter, extended to dorsal margin, sometimes small spot on fold separate; discal spot extended to dorsal margin, widest at fold; spot at end of cell extended to tornus.

GENITALIA ♂ (Fig. 69). Uncus hook simple, as long as tegumen. Anterior margin of tegumen medially with deep emargination which nearly reaches base of uncus. Emargination constricted near middle of tegumen, posterior part expanded, round. Valva distally dilated; costal margin straight; distal margin straight, at acute angle to costa; distal part of valva extended ventrad to form broad, triangular apex. Sacculus separated from valva by deep emargination, broad, apex rounded, ventral margin straight, setose. Saccus rounded, about three-quarters size of tegumen. Basal half of aedeagus inflated, sclerotized; apical half slightly narrower, membranous, supported by narrow lateral sclerotization; big blunt ventral thorn below apex. Ductus ejaculatorius without sclerotized lamina.

GENITALIA ♀ (Figs 88, 89). Apophysis posterior twice length of apophysis anterior. Eighth sternite membranous, with minute spines which extend into antrum. Sclerotized ventral branch of apophysis anterior extends along anterior margin of eighth sternite. Antrum a wide pouch with gently curved ventral margin, laterally supported by ventral branch of apophysis anterior, anterior margin convex. Colliculum touches antrum. Ductus bursae about length of apophysis posterior, at entrance of corpus bursae about twice as wide as at colliculum. Corpus bursae oval, inner surface with minute spines. Signum a strong hook, concave surface of apical half serrate, base plate elongate, scobinate.

REMARKS. *D. distinctella* differs from *peltosema* by the distinct dark markings of the fore wing, particularly the large spot between the tornus and the end of the cell. In the ♂ genitalia *distinctella* differs from *peltosema* by the deep emargination of the anterior margin of the tegumen, the much broader distal portion of the valva, the rounded sacculus and the stronger ventral thorn below the apex of the aedeagus. The ♀ genitalia of *distinctella* differ from those of *peltosema* by the larger antrum and the ventral margin of the ostium bursae which lacks the distinct median emargination. For differences between *distinctella* and *typica* see p. 277.

The holotype specimen of *distinctella* was sent by the collector, the late Sir Reginald M. Maxwell, to Meyrick who labelled it 'Dharwar, Kanara'. However, a second specimen collected on the same day is labelled 'Hebsur', and this agrees with the dates and localities in an itinerary which was very kindly made available to me by Lady L. Maxwell.

BIOLOGY. Host-plant unknown. Moths have been collected in January–March and September–November.

DISTRIBUTION. India.

MATERIAL EXAMINED.

Holotype ♂, **India**: Dharwar, Hebsur [15°28′ N, 75°18′ E], 28.i.1916 (*Maxwell*) (genitalia slide no. 14 856; BMNH).

Paratypes. **India**: 2 ♂, 1 ♀, Bombay, Bassein Fort, x.1909 (*A.M.*) (BMNH); 1 ♀, East Khandesh, Chopda, 27.xi.1917 (*Maxwell*) (BMNH); 1 ♀, [Central Prov.,] Nagpur, 10.ix.1931 (*Dult*) (BMNH); 1 ♀, Dharwar, Hebsur, 28.i.1916 (*Maxwell*) (BMNH); 1 ♀, Dharwar, Kolivad, 6.ii.1916 (*Maxwell*) (BMNH); 1 ♂, S. India, [Madras,] Coimbatore, 5.iii.1913 (*Fletcher*) (BMNH).

Deltophora fasciella sp. n.

(Figs 41, 42, 70, 90)

[*Teleia maculata* Staudinger; Amsel, 1935 : 263 (partim). Misidentification.]
[*Teleia maculata* Staudinger; Amsel, 1961 : 59 (partim). Misidentification.]

♂, ♀. 5·0–6·5 mm. Head pale whitish brown, speckled with darker brown. Labial palpus whitish with brown markings: outer surface of basal segment dark; outer surface of second segment with dark scales near base and before apex; third segment with narrow ring around middle and some dark scales on apex. Antenna dark brown with lighter rings above. Thorax as head, speckled to varying degree with darker brown, with pair of dark lateral spots and dark apex of mesoscutellum. Tegula whitish brown with dark base. Fore wing pale whitish brown with dark markings: several fine spots on costa; discal spot extended to costa and dorsal margin to form distinct transverse band; small spot at end of cell; some darker scales in apical portion of wing.

GENITALIA ♂ (Fig. 70). Uncus hook simple, shorter than tegumen. Anterior margin of tegumen with wide emargination. Valva distally dilated; costal margin straight or very gently curved; distal margin convex; distal part of valva extended ventrad to form strong beak-like apex. Sacculus separated from valva by deep emargination, broad, rounded, margin setose. Saccus rounded, about half size of tegumen. Basal three-quarters of aedeagus inflated, sclerotized; apical quarter membranous, supported by narrow lateral sclerotization; strong ventral thorn below apex. Ductus ejaculatorius without sclerotized lamina.

GENITALIA ♀ (Fig. 90). Apophysis posterior 1·5 times length of apophysis anterior. Eighth sternite membranous, with gently curved sclerotized band along anterior margin. Antrum a very short membranous funnel. Colliculum touches antrum. Ductus bursae about 3 times length of apophysis posterior, at entrance of corpus bursae about 3 times as wide as at colliculum. Corpus bursae spherical, inner surface with minute spines which extend short distance into extreme anterior portion of ductus bursae. Signum a strong hook, concave surface serrate, base plate elongate, scobinate.

REMARKS. The ground colour of the fore wing is variable; in two ♀ from Israel (Fig. 42) and Afghanistan it is almost white. In the ♂ genitalia the anterior emargination of the tegumen is variable; it is broad, angular or somewhat tapered, and reaches the middle or the anterior third of the tegumen.

D. fasciella is externally similar to *maculata*, with which it has been confused and which may occur in the same area. It differs from *maculata* by the complete transverse fascia of the fore wing. The ♂ genitalia resemble those of *typica*, *peltosema* and *distinctella* but differ by the short apical portion of the aedeagus with a strong ventral thorn. The ♀ genitalia are closest to those of *typica*; they differ by the membranous antrum (sclerotized in *typica*) and the stronger signum which is situated in the posterior part of the corpus bursae (anterior part in *typica*). For further differences see *typica*, p. 277.

A single ♂ from the Sudan agrees with *fasciella* in the genitalia; however, the discal spot of the fore wing is not extended to the costal margin. This specimen is excluded from the type-series of *fasciella*.

I was unable to trace the exact location of Shaib Ghurban, the locality of the holotype; however, several other localities in which Philby collected at the same time are situated in south-western Saudi Arabia (Najrān oasis–Wadi Habawnāh area) on the border of Yemen (Scott, 1957).

BIOLOGY. Host-plant unknown. Moths have been collected in April, May and November.

DISTRIBUTION. [? Sudan (Kassala Prov.)]; Israel (Jordan west bank territories); S.W. Saudi Arabia; S. Iran (Luristan); E. Afghanistan.

MATERIAL EXAMINED.

Holotype ♂, **Saudi Arabia**: [Najrān oasis–Wadi Habawnāh area] Shaib Ghurban, 15.xi.1936 (*Philby*) (genitalia slide no. 14 830; BMNH).

Paratypes. **Israel**: 1 ♀, [Jordan west bank territories,] Wadi el Kelt, Georgskloster, 15.iv.1930 (*Amsel*) (LN, Karlsruhe). **Iran**: 3 ♂, 2 ♀, S. Iran, [Luristan,] Abad-Geno, 40 km N. of Bandar-Abbas, 27.iv, 6.v.1974 (*Exped. Mus. Vindob.*) (NM, Vienna; BMNH); 1 ♂, S. Iran, [Luristan,] 22 km N. of Bandar-Abbas, 22.iv.1974 (*Exped. Mus. Vindob.*) (NM, Vienna). **Afghanistan**: 1 ♀, E. Afghanistan, Sarobi, 1100 m, 9.vi.1957 (*Wegner*) (LN, Karlsruhe).

Material excluded from the type-series. **Sudan**: 1 ♂, Kassala Prov., Erkowit, 1000–1300 m, 20.iv.1962 (*Remane*) (BMNH).

The *maculata*-group

GENITALIA ♂. Uncus strongly dilated. Sacculus separated from valva, pointed or digitate. Sclerotized juxta present. Ductus ejaculatorius with sclerotized lamina.

GENITALIA ♀. Posterior margin of seventh segment with pair of pleural pits. Ventral margin of ostium bursae posteriorly convex or concave. Antrum sclerotized or membranous. Inner surface of corpus bursae without spines. Signum reduced: sclerotized plate with one or two longitudinal serrated crests.

DISTRIBUTION. S.E. Europe; W. Asia; India.

Deltophora maculata (Staudinger, 1879) **comb. n.**

(Figs 1, 2, 5, 6, 16–27, 43, 44, 60, 63, 71, 91–94)

Teleia maculata Staudinger, 1879, *Horae Soc. ent. ross.* **15** : 314. LECTOTYPE ♀, TURKEY: Amasya, Kerasdere, vii–viii.1875 (*Staudinger*) (genitalia slide no. 617b, Sattler; MNHU, Berlin), here designated [examined].
Teleia maculata Staudinger; Seebold, 1898 : 30.
Gelechia (*Teleia*) *maculata* (Staudinger) Rebel, 1901 : 151.
[? Genus] *maculata* (Staudinger) Spuler, 1910 : 359.
Teleia maculata Staudinger; Rebel, 1915 : (54).
Teleia maculata Staudinger; Caradja, 1920 : 105 (partim).
Aristotelia maculata (Staudinger) Meyrick, 1925 : 47.
Teleia maculata Staudinger; Rebel, 1929 : 204.
Teleia maculata Staudinger; Amsel, 1933 : 125.
Teleia maculata Staudinger; Amsel, 1935 : 263 (partim).
Aristotelia maculata (Staudinger); Gaede, 1937 : 64.
Teleia maculata Staudinger; Amsel, 1953 : 415.
Teleia maculata Staudinger; Kuznetzov, 1960 : 34.

♂, ♀. 5·0–7.0 mm. Head whitish grey to grey-brown, vertex speckled with brown. Labial palpus as head; outer surface of basal segment brown; outer surface of second segment with dark scales near base and apex; third segment with dark apex and ring below middle. Antenna dark brown with lighter rings above. Thorax as head, speckled with darker brown, with lateral pair of dark spots and dark apex of mesoscutellum. Tegula as head and thorax, with dark base. Fore wing whitish grey to grey-brown, with dark brown markings: small spots on costa at base, one-fifth and three-fifths, sometimes several small spots in between, in second and third fifth of costa; plical spot at one-fifth; discal spot extended to dorsal margin, sometimes nearly reaching costa as well; spot at end of cell often extended to tornus. Apical portion of wing darker than basal four-fifths, sometimes completely dark brown (Fig. 43). Dark fore wing markings sometimes lined with ochreous scales.

GENITALIA ♂ (Figs 16–26, 71). Length of individual scales of posterior pair of coremata about 8 times their greatest width. Uncus medially strongly dilated, about as long as tegumen. Anterior margin of tegumen with wide triangular or arcuate emargination. Costal margin of valva curved, sometimes with small process on distal part. Apex of valva rounded. Sacculus much shorter than valva, apex with strong point. Juxta large, subtriangular, strongly sclerotized. Saccus as large as tegumen. Basal half of aedeagus inflated, sclerotized; apical half membranous, supported by narrow ventro-lateral sclerotization which

bears strong thorn near middle of aedeagus. Ductus ejaculatorius with large sclerotized lamina of about half length of aedeagus.

GENITALIA ♀ (Figs 27, 91–94). Posterior margin of seventh abdominal segment with pair of strongly sclerotized pleural pits (Fig. 63). Membranous intersegmental region between eighth segment and papillae anales with deep ventral invagination (Figs 91–94). Apophysis posterior about twice length of apophysis anterior. Ostium bursae in or slightly behind middle of eighth sternite. Ventral margin of ostium with subtriangular posterior extension. Anterior margin of eighth sternite weakly concave. No sclerotized antrum. Colliculum close to ostium bursae. Length and size of ductus and corpus bursae variable. Corpus bursae without spines. Signum variable, typically an irregularly shaped sclerotized plate, scobinate, with serrated longitudinal ridge.

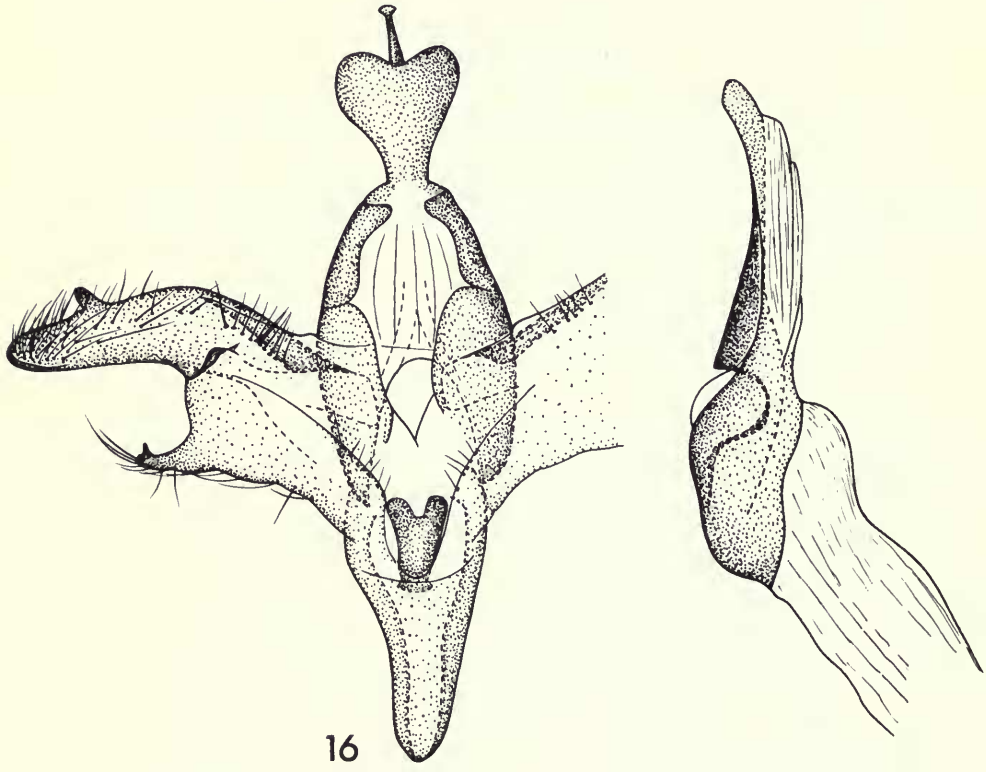
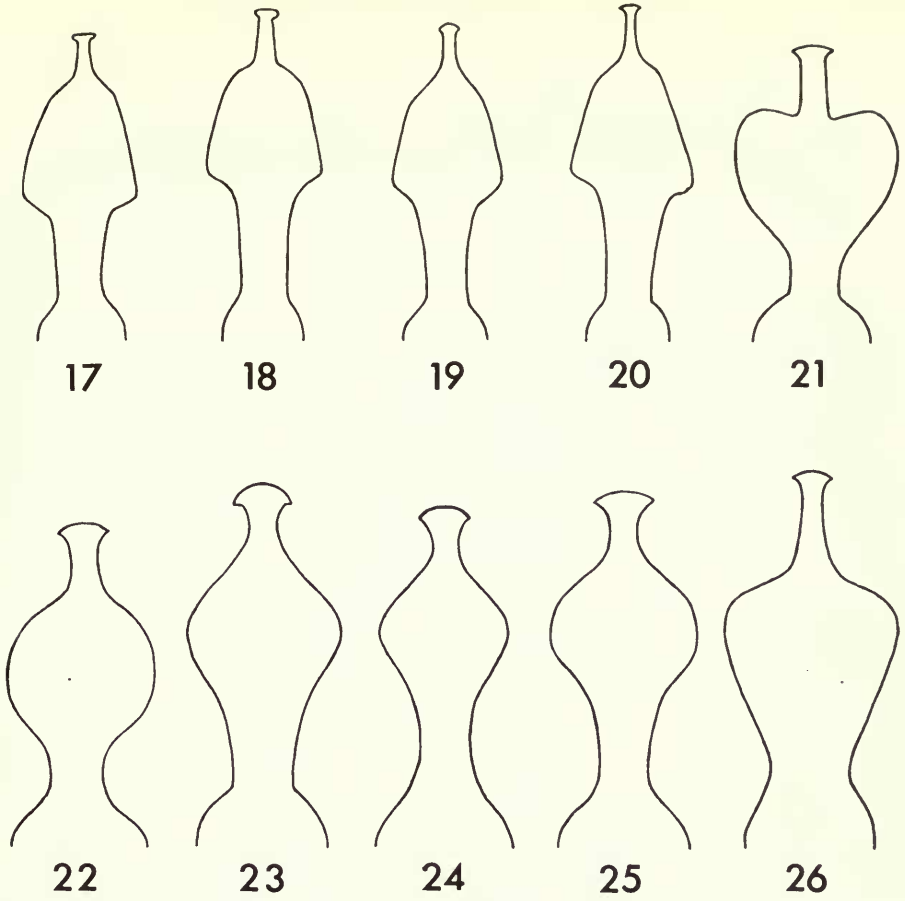


Fig. 16 *Deltophora maculata* (Staudinger), ♂ genitalia. Turkey, Anatolia (slide no. 400; ZSBS, Munich).

REMARKS. *D. maculata* exhibits considerable individual and geographic variation, externally and in the genitalia. The second segment of the labial palpus varies from almost completely dark with only a light ring at the apex and a few light patches on the inner surface to light with a few dark scales at the base and apex. On the fore wing the apex can be dark brown or as light as the rest of the wing; the shape and size of the dark markings are also variable. In the ♂ genitalia the shape of uncus, valva and juxta and the length of the apex of the sacculus vary. As an example the uncus shapes of several specimens are illustrated (Figs 17–26). In specimens from northern Turkey (Pontus) and the Lebanon the dilated posterior portion of the uncus resembles an arrowhead; in specimens from northern Syria and central Anatolia (Akşehir) it is heart-shaped and in specimens from Georgia and Afghanistan rounded or ovoid. In a specimen from the Lebanon (Fig. 26), which was collected together with the specimen illustrated in Fig. 19, it approaches the shape of the uncus of Syrian specimens. In the ♀ the eighth sternite is sclerotized to a varying



Figs 17–26 *Deltophora maculata* (Staudinger), ♂ genitalia. Outlines of uncus. 17, Turkey, Pontus (slide no. 15 423; BMNH). 18, Turkey, Pontus (slide no. 15 421; BMNH). 19, Lebanon (slide no. 16 392; BMNH). 20, Lebanon (slide no. 15 406; BMNH). 21, Syria (slide no. 14 832; BMNH). 22, U.S.S.R., Georgia (slide no. 15 434; BMNH). 23, Afghanistan (slide no. 15 411; BMNH). 24, Afghanistan (slide no. 14 783; BMNH). 25, Afghanistan (slide no. 3471; NM, Vienna). 26, Lebanon (slide no. 6470, Jäckh; coll. Jäckh, Bidingen).

degree and the subtriangular sclerotization on the ventral margin of the ostium bursae varies in size and shape. The signum is usually reduced and bears one or two serrated ridges; the anterior end of the stronger ridge is sometimes developed into a robust spine. Length and size of ductus and corpus bursae are also variable. There is usually a clear division into ductus and corpus; however, the former is sometimes strongly dilated from the colliculum so that no distinction of the two parts is possible.

D. maculata is externally similar to *fasciella*; it differs by the discal spot which never reaches the costal margin of the fore wing. *D. beatrix* which belongs to the same species-group differs externally by the cream colour and the broad transverse band of the fore wing. In the ♂ genitalia the uncus of *maculata* is narrow at the base and distally dilated, whereas in *beatrix* it is widest near the base and gently tapered towards the apex; *beatrix* also differs by the distally dilated valva and the long digitate process of the sacculus. In the ♀ genitalia *maculata* differs from all other species by the subtriangular posterior plate on the ventral margin of the ostium bursae.

Spuler (1910 : 359) noticed the presence of ocelli and therefore excluded *maculata* from *Teleia* without, however, assigning it to another genus. Meyrick (1925 : 47) transferred *maculata* to

Aristotelia which was a more logical place for it. Meyrick (l.c.) placed *korbi* Caradja as a possible synonym of *maculata*; this is incorrect, as *korbi* is a separate species.

The date of publication was erroneously cited as 1880 by several authors. The correct date (1879, November 1st) was taken from 'Repartition des livraisons', issued with the 'Tables des matières' of *Horae Soc. ent. ross.* **15.**

D. maculata was described from an unspecified number of specimens collected by Staudinger at light near Amasya from the beginning of July to the beginning of August, 1875. In coll. Staudinger (MNHU, Berlin) there are 1 ♂, 3 ♀, bearing Staudinger's pink printed label 'Origin.'.

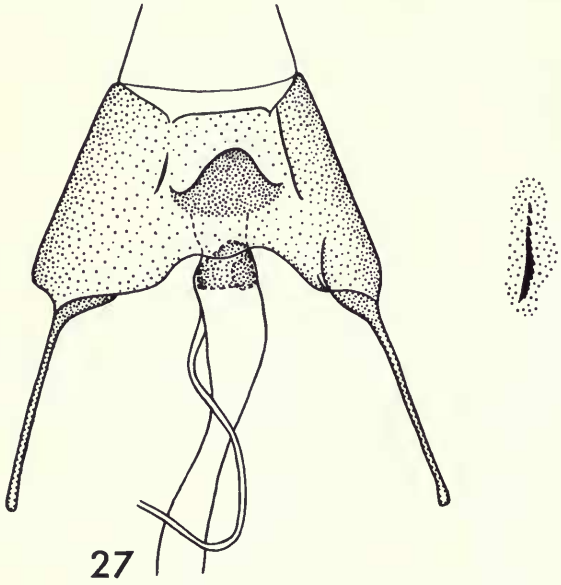


Fig. 27 *Deltophora maculata* (Staudinger), ♀ genitalia. Turkey, Pontus (slide no. 12 549; BMNH).

The first specimen in the series, a ♀ with the locality label 'Amasia m[ihi].', is here designated as the lectotype. The other three specimens, now labelled as paralectotypes, bear no locality labels; however, two of them bear small labels with their date of capture. For detailed information on the type-locality 'Kerasdere' [=valley of the cherries] see Staudinger (1878 : 206).

Some information, including ecological data, on the collecting sites of Amsel (Afghanistan, 1956) and Kasy and Vartian (Syria and Lebanon, 1961; Iran and Afghanistan, 1963) was published by Amsel (1957) and Kasy (1964; 1965) respectively.

I was unable to trace 'Shar Deresy' which must be somewhere north or south of the present Turkish–Syrian border. Material from this locality was obtained in the 1890s by a native collector for J. H. Leech through whom it reached Lord Walsingham and finally the BMNH. Specimens in the BMNH collection are labelled 'Syria, Haleb, Shar Devesy'. 'Devesy' is an error for 'Deresy' and probably originated from someone misreading a handwritten label. The old Ottoman province of Haleb comprised parts of Syria and Turkey. In Walsingham's notebook on the Leech collection 'Syria' was subsequently replaced by 'Asiatic Turkey'; however, it is unknown by whom and on what evidence.

Material examined from the Jordan west bank territories is recorded under Israel.

BIOLOGY. Host-plant unknown. Moths have been collected in April–September and November. According to Kuznetzov (1960 : 34) *maculata* is common in the arid higher altitudes of the western Kopet Dag, where it occurs in one generation from May till August.

DISTRIBUTION. U.S.S.R. (Georgia; Armeniya; Azerbaydzhan); Turkey; Syria; Lebanon; Israel (including Jordan west bank territories); Iran; Afghanistan. According to the literature also

found in Greece (Parnassos) (Rebel, 1915 : 54) and U.S.S.R. (Turkmeniya) (Kuznetzov, 1960 : 34); according to Klimesch (personal communication) in Crete.

Several authors have erroneously recorded *maculata* from S. France, Israel and S.W. Arabia. Re-examination of the material concerned has revealed the following misidentifications: S. France (Caradja, 1920 : 105; Gaede, 1937 : 64; Lhomme, [1946] : 561; Amsel, 1961 : 59) – *stictella*; Israel (Amsel, 1935 : 263, partim), S.W. Arabia (Amsel, 1961 : 59) – *fasciella*.

MATERIAL EXAMINED.

U.S.S.R.: 1 ♂, Georgia, Borshom, [near Tbilisi,] 2.vi.1880 (*Christoph*) (BMNH); 1 ♂, 3 ♀, Armeniya (collectors unknown) (BMNH; MNHN, Paris; MINGA, Bucharest); 1 ♂, Azerbaydzhan, Lenkoran, 20.vi.1884 (*Christoph*) (BMNH). **Turkey**: 4 ♂, Anatolia, Kizilcahamam, 700 m, 31.vii–1.viii.1963 (*Arenberger*) (coll. Arenberger, Vienna); 5 ♂, 5 ♀, Pontus (*Staudinger*) (BMNH); 1 ♂, 2 ♀, Amasya, 22.vii, 2.viii.1875 (*Staudinger*) (MNHU, Berlin) (paralectotypes); 2 ♂, 2 ♀, Amasya (collectors unknown) (BMNH; MINGA, Bucharest); 1 ♂, 5 km N.W. of Gümüşane, 1050 m, 12.vi.1969 (*Arenberger*) (coll. Arenberger, Vienna); 1 ♂, 1 ♀, Central Anatolia, Akşehir, 1200 m, 16–30.ix.1934 (*Osthelder*) (ZSBS, Munich); 2 ♂, Akşehir (collector unknown) (MINGA, Bucharest); 1 ♂, Dim Çay valley, 500 m, 14.ix.1968 (collector unknown) (coll. Burmann, Innsbruck); 1 ♀, Taurus, 1906 (*J.*) (BMNH); 1 ♀, Maraş (collector unknown) (MINGA, Bucharest); 1 ♂, 1 ♀, Central Taurus, Maraş, 600–900, 1200 m, 19.v.1928, v.1930 (native collector) (ZSBS, Munich); 1 ♀, Northern Amanus mts, Yüksek Dağ, Jeşil dere, vii.1932 (native collector) (ZSBS, Munich). **Syria**: 2 ♂, 4 ♀, Haleb, Shar Deresy ('Shar Devesy'), 1893 (native collector) (BMNH); 1 ♀, 60 km N.E. of Latakia, 6–7.vi.1961 (*Kasy & Vartian*) (NM, Vienna). **Lebanon**: 1 ♀, 15 km E. of Batroun, 12.v.1961 (*Kasy & Vartian*) (NM, Vienna); 1 ♀, Beirut (collector unknown) (MINGA, Bucharest); 3 ♂, 3 ♀, 25 km N. of Beirut, 11.v.1961, 12.v.1963 (*Kasy & Vartian*) (BMNH; NM, Vienna; coll. Glaser, Vienna; coll. Jäckh, Bidingen); 2 ♂, 1 ♀, E. of Saida, 9–16.v.1963 (*Kasy & Vartian*) (NM, Vienna) [first record for Lebanon]. **Israel**: 1 ♂, Tel-Aviv, 26–27.xi.1925 (*Bodenheimer*) (NM, Vienna); 1 ♀, Jerusalem (collector unknown) (MINGA, Bucharest); 1 ♂, Ain Karim, 10 km W. of Jerusalem, 1.vi.1930 (*Amsel*) (LN, Karlsruhe); 1 ♂, Jerusalem, Ramallah, 21.iv.1930 (*Amsel*) (LN, Karlsruhe). **Iran**: 1 ♀, Prov. Tehran, Ab–Ali, 2550 m ('8250 feet'), 25.vi.1973 (*Cottrill & Tremewan*) (BMNH); 1 ♀, Vanak, 15 km N. of Tehran, 1600 m, 1–10.vii.1962 (*Vartian*) (NM, Vienna); 2 ♀, Derbend, 25 km N. of Tehran, 2000 m, 28–30.v, 7–15.vi.1963 (*Kasy & Vartian*) (BMNH; NM, Vienna); 1 ♀, N.E. Iran, 20 km E. of Sabzevar, 20.vi.1963 (*Kasy & Vartian*) (NM, Vienna); 1 ♀, N.E. Iran, W. of Mashad, 21.vi.1963 (*Kasy & Vartian*) (NM, Vienna) [first record for Iran]. **Afghanistan**: 3 ♂, 4 ♀, N. Afghanistan, Herat, 970 m, 5.v.1956 (*Amsel*) (LN, Karlsruhe); 15 ♂, 31 ♀, N. Afghanistan, Pul-i-Khumri ('Polichomri'), 700 m, 5.vi.1956 (*Amsel*) (BMNH; LN, Karlsruhe); 6 ♂, 1 ♀, Khurd-Kabul, S.E. of Kabul, 1900 m, 5.vii.1963, 20.v–5.vii.1965 (*Kasy & Vartian*) (NM, Vienna); 1 ♂, 1 ♀, 10 km N.W. of Kabul, 1900 m, 1, 25.vi.1965 (*Kasy & Vartian*) (NM, Vienna); 2 ♂, 2 ♀, Nuristan, Bashgul valley, 1100–1200 m, 6–19.v.1953 (*Klapperich*) (LN, Karlsruhe) [first record for Afghanistan].

Deltophora beatrix sp. n.

(Figs 45, 72)

♂. 6·0 mm. Head cream. Labial palpus as head, outer surface of first segment brown; third segment with some scattered brown scales. Antenna light, with dark brown rings above. Thorax slightly darker than head, mesoscutellum laterally with pair of dark spots. Tegula as thorax, base dark brown. Fore wing cream, with black markings: costa with dark base and small spot at one-quarter, small spot on base of dorsal margin, broad band across middle of wing, narrow band across third quarter of wing connected along termen with dark apex.

GENITALIA ♂ (Fig. 72). Length of individual scales of posterior pair of coremata about 5 times their greatest width. Uncus about as long as tegumen, base inserted on dorsal surface of latter; distal portion of uncus long, arising on dorsal surface of basal portion, forming dorsally open trough; basal portion short, narrowing posteriorly; distal portion evenly dilated from base, widest at basal quarter, tapering posteriorly; apex broad, convex. Posterior margin of tegumen truncate, slightly concave, anterior margin with triangular emargination. Valva distally dilated, narrowest near middle, widest at four-fifths; costal margin gently curved, distal margin strongly convex. Sacculus three-quarters length of valva, with long digitate process; ventral margin set with long setae. Juxta small, strongly sclerotized, posteriorly with V-shaped emargination. Saccus as long as tegumen but much narrower. Base of aedeagus slightly inflated, sclerotized; apical portion longer than base, supported by narrow ventral sclerotization, with strong thorn near base. Ductus ejaculatorius with large sclerotized lamina of nearly half length of aedeagus.

GENITALIA ♀. Unknown.

REMARKS. *D. beatrix* differs from all other *Deltophora* species by the wing colour and the wide band across the middle of the fore wing. The ♂ genitalia do not resemble closely those of other species; the differences between *beatrix* and *maculata* are discussed on p. 285.

BIOLOGY. Host-plant unknown. Moths have been collected in early May.

DISTRIBUTION. S. Iran (Luristan).

MATERIAL EXAMINED.
Holotype ♂, **Iran**: S. Iran, [Luristan,] Abad-Geno, 40 km N. of Bandar-Abbas, 6.v.1974 (*Exped. Mus. Vind.*) (NM, Vienna).
Paratype. 1 ♂, same data as holotype (NM, Vienna).

Deltophora pauperella sp. n.

(Figs 46, 95)

♀. 6·5 mm. Labial palpus whitish, outer surface of second segment with some scattered brown scales; third segment without dark scales. Antenna dark brown, with lighter rings above. Thorax light ochreous, speckled with brown. Tegula light ochreous, with dark brown base. Fore wing light ochreous, with dark brown markings: plical spot at one-fifth, oblique, extended across fold but not reaching dorsal margin; discal spot extended to dorsal margin; small spot at end of cell. Apical portion of wing speckled with brown.

GENITALIA ♂. Unknown.

GENITALIA ♀ (Fig. 95). Posterior margin of seventh abdominal segment with lateral pair of sclerotized pits. Apophysis posterior 3 times length of apophysis anterior, with distinct node at posterior third. Eighth segment nearly twice length of apophysis anterior. Ostium bursae at anterior third of eighth sternite. Ventral portion of antrum strongly sclerotized, anterior margin triangularly extended. Colliculum narrow, very close to antrum. Bursa copulatrix not clearly differentiated into ductus and corpus bursae, ductus bursae gradually and evenly widened into corpus bursae. Signum an almost circular plate with somewhat irregular margin; strong ridge on anterior two-thirds extended into corpus bursae.

REMARKS. The only specimen is rubbed; the head is almost completely denuded. In fresh specimens the ground-colour of head, thorax and fore wings is probably much darker.

D. pauperella is closest to *maculata* and shares with it the sclerotized pleural pits on the posterior margin of the seventh abdominal segment. It differs in the ♀ genitalia by the much longer apophyses posteriores and the absence of a subtriangular extension on the ventral margin of the ostium bursae.

BIOLOGY. Unknown.

DISTRIBUTION. India (Punjab).

MATERIAL EXAMINED.
Holotype ♀, **India**: Punjab, Dharmsala (*Hocking*) (genitalia slide no. 14 825; BMNH).

The *stictella*-group

GENITALIA ♂. Uncus hook simple. Valva distally dilated, with short process. Sacculus short, rounded, not separated from valva. Sclerotized juxta present. Ductus ejaculatorius without sclerotized lamina.

GENITALIA ♀. Posterior margin of seventh segment without pleural pits. Ventral margin of ostium bursae posteriorly convex. Antrum with subtriangular sclerotization. Inner surface of corpus bursae without spines. Signum a big invagination at entrance of corpus bursae.

DISTRIBUTION. Spain; S. France; N.W. Italy.

Deltophora stictella (Rebel, 1927) **comb. n.**

(Figs 8–11, 28, 29, 47, 48, 73, 96, 97)

Teleia stictella Rebel, 1927, *Z. öst. EntVer.* **12** : 118. LECTOTYPE ♂, SPAIN: Andalucía, Prov. Granada, Sierra de Alfacar, vii.1926 (*Bubacek*) (NM, Vienna), here designated [examined].
[*Teleia maculata* Staudinger; Caradja, 1920 : 105 (partim). Misidentification.]
[*Aristotelia maculata* (Staudinger); Gaede, 1937 : 64 (partim). Misidentification.]
Telphusa stictella (Rebel) Gaede, 1937 : 138.
[*Aristotelia maculata* (Staudinger); Lhomme, [1946] : 561. Misidentification.]
[*Teleia maculata* Staudinger; Amsel, 1961 : 59 (partim). Misidentification.]
Teleiodes stictella (Rebel) Agenjo, 1968 : [3].

♂, ♀. 6·0–7·5 mm. Head, base of proboscis, maxillary palpus and labial palpus ochreous. Vertex sometimes with broad, longitudinal, grey-brown band. Labial palpus with scattered brown scales on outer surface of first and second segment; third segment with scattered brown scales in apical half but without ring around middle. Antenna dark brown, with lighter rings above. Thorax grey with pair of indistinct dark spots on lateral margin of mesoscutellum. Tegula with dark base and lighter apex. Fore wing grey or grey-brown, apical portion beyond end of cell sometimes darker than basal two-thirds of wing. Wing markings dark brown or black, delicately lined with ochreous or light brown scales. Basal fascia incomplete; dark spot on costa, bigger spot in fold and small spot on dorsal margin; discal spot sometimes extended to dorsal margin; distinct spot at end of cell. Usually large light spot on costa at three-quarters and weaker spot on tornus, sometimes connected by indistinct light transverse line. Base of fringes with series of light dots from costa to tornus.

GENITALIA ♂ (Figs 28, 73). Uncus hook simple, shorter than or about as long as tegumen. Anterior margin of tegumen arcuate, without deep median emargination. Valva distally dilated, narrowest near middle; costal margin curved, concave; distal margin convex, with short apical process. Sacculus not separated from valva, short, margin rounded, setose. Sclerotized juxta present. Saccus smaller than tegumen. Basal half of aedeagus strongly inflated, sclerotized; dorsal portion of apical half membranous, ventral portion sclerotized, with strong thorn directed towards base of aedeagus. Ductus ejaculatorius without sclerotized lamina.

GENITALIA ♀ (Figs 29, 96, 97). Apophysis posterior about 2·5 times length of apophysis anterior. Middle and posterior part of eighth sternite membranous, with minute spines; anterior part sclerotized, anterior margin convex. Ostium bursae at anterior third of eighth sternite, ventral margin slightly extended posteriorly, convex. Ventral wall of antrum with triangular sclerotization. Colliculum near antrum. Ductus bursae about 3 times length of apophysis posterior, at entrance of corpus bursae 3 times as wide as at colliculum. Corpus bursae oval, without spines. Big signum at entrance of corpus bursae, scobinate, composed of two deep folds, which extend into corpus bursae, and narrow tongue which extends into anterior portion of ductus bursae.

REMARKS. The fore wing colour of *stictella* varies from very light to dark grey, the wing markings, particularly the discal spot, vary in size. In a ♀ from southern Spain, collected together with a series of normal specimens, the discal spot and that at the end of the cell are enlarged and fused (Fig. 48).

D. stictella has in the past been confused with *maculata*; however, in *stictella* the ochreous head contrasts more with the grey fore wing than in the overall brown *maculata*. In the fore wing the dark spot at the end of the cell is well defined in *stictella* whereas in *maculata* it is frequently extended to the tornus. The third segment of the labial palpus bears in *maculata* a sometimes incomplete dark brown ring around the middle; in *stictella* it lacks such a ring. The ♂ genitalia of *stictella* differ from those of *maculata* by the simple uncus, distally dilated valva, poorly developed sacculus (which lacks an apical point), shorter and wider saccus and plumper aedeagus (which resembles more that of the North American *glandiferella*). In the ♀ genitalia *stictella* differs from *maculata* by the ventral margin of the ostium bursae which is posteriorly convex but lacks the subtriangular extension; *stictella* is also distinguished by the large specialized signum. The distribution areas of *stictella* and *maculata* do not appear to overlap.

D. stictella was described from 1 ♂, 3 ♀, collected by Bubacek and Reisser at the beginning of July, 1926, in the Sierra de Alfacar near Granada (Spain). The ♂ is here designated as the lectotype.

BIOLOGY. Host-plant unknown. The moths are readily attracted to light and have been collected from the last third of June till the middle of August, at altitudes between 700 m and 2000 m. There appears to be only one generation a year.

DISTRIBUTION. Spain (Cataluña, Andalucía); S. France (Basses-Alpes, Alpes-Maritimes); Italy (Piemonte, Liguria).

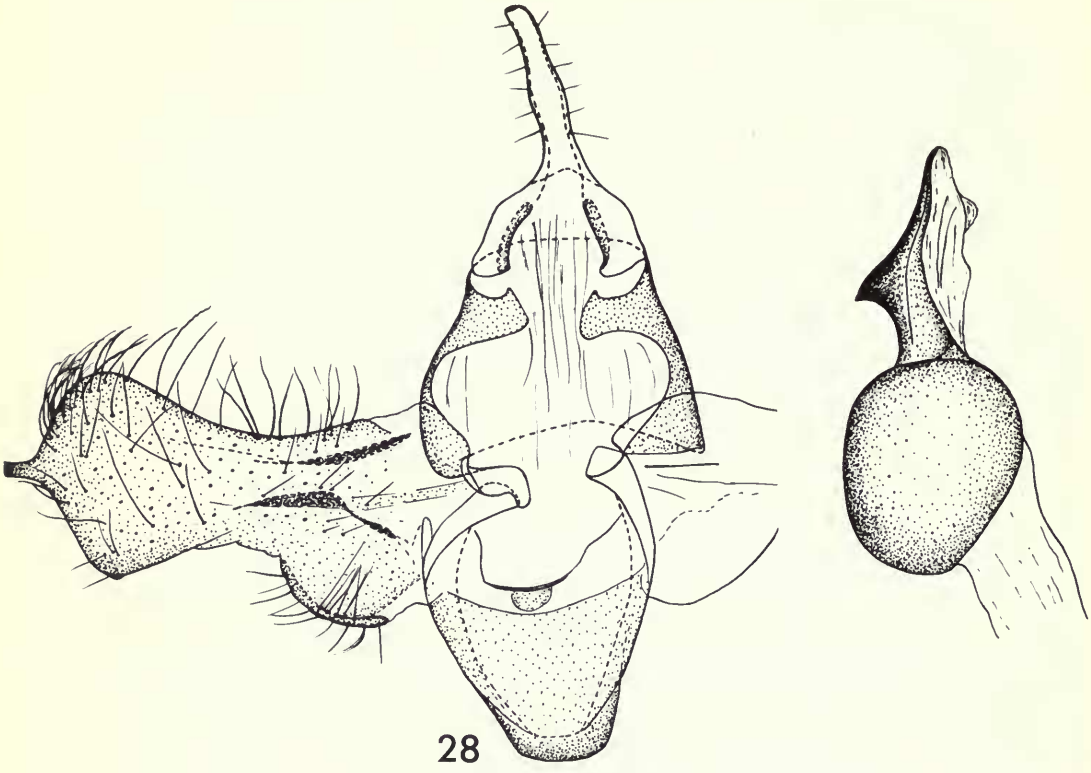


Fig. 28 *Deltophora stictella* (Rebel), ♂ genitalia. Spain, Cataluña (slide no. 443c, Sattler; MZ, Barcelona).

MATERIAL EXAMINED.

Spain: 1 ♂, Cataluña, Balenya, 28.vi.1940 (*Vilarrubia*) (MZ, Barcelona); 1 ♀, Andalucía, Prov. Granada, Sierra de Alfacar, 1500 m, 6.vii.1926 (*Reisser*) (LN, Karlsruhe) (paralectotype); 1 ♂, 2 ♀, Sierra de Alfacar, 8–14.vii.1960 (*Vartian*) (NM, Vienna; coll. Burmann, Innsbruck); 2 ♀, Sierra de Alfacar, 1200 m, 26.vi–8.vii.1962 (*Glaser*) (NM, Vienna); 3 ♂, 8 ♀, Sierra de Alfacar, 1300 m, 3–9.vii.1962 (*Sattler*) (BMNH); 3 ♀, Prov. Granada, Puerto de la Mora, 1400 m, 30.vii.1969 (*Sattler & Carter*) (BMNH); 9 ♂, 21 ♀, Prov. Granada, valley of Rio Fardes, W. of Diezma, 1250 m, 14–20.vii.1962, 22.vi.1968 (*Sattler; Sattler & Carter*) (BMNH); 1 ♂, Prov. Granada, Sierra Nevada, road to Veleta, 2000 m, 27.vii.1969 (*Sattler & Carter*) (BMNH). **France**: 2 ♂, 3 ♀, Basses-Alpes, Digne, vii, 18.vii.1903 (*Chrétien*) (MNHN, Paris); 1 ♂, 3 ♀, [? Basses-Alpes,] Molières, 6.viii.1903 ([*Chrétien*]) (MINGA, Bucharest); 5 ♂, 2 ♀, Basses-Alpes, Digne, Mt Courbons, 16, 18.vii.1969 (*Jäckh*) (coll. Jäckh, Bidingen); 1 ♂, Digne, Vallée Miraux, 15.vii.1969 (*Jäckh*) (coll. Jäckh, Bidingen); 2 ♂, 3 ♀, Digne, Vallée Miraux, Les Dourbes, 17.vii.1969 (*Jäckh*) (coll. Jäckh, Bidingen); 1 ♀, Digne, Les Dourbes, 700 m, 9–11.vii.1962 (*Arenberger*) (coll. Arenberger, Vienna); 4 ♂, Basses-Alpes, St-André-les-Alpes, 31.vii.1915, 2, 4.viii.1917 (*Viard*) (MNHN, Paris); 5 ♂, Basses-Alpes, Annôt, 700 m ('2300 feet'), 1.viii.1913 (*Walsingham*) (BMNH); 2 ♀, Alpes-Maritimes, Belvédère, 2, 8.viii.1920 (*Lhomme*) (MNHN, Paris); 1 ♂, 1 ♀, Alpes-Maritimes, Peira Cava, 1500 m ('4800 feet'), 14, 15.viii.1911 (*Walsingham*) (BMNH) [first record for France]. **Italy**: 4 ♀, Piemonte, Val Susa, Rocciamelone, 1000 m, 22.vi.1959, 18.vii.1965, 23.vii.1966 (*Jäckh*) (coll. Jäckh, Bidingen); 1 ♂, 1 ♀, Liguria, Passo di Teglia, 1100 m, 15.viii.1968 (*Jäckh*) (coll. Jäckh, Bidingen) [first record for Italy].

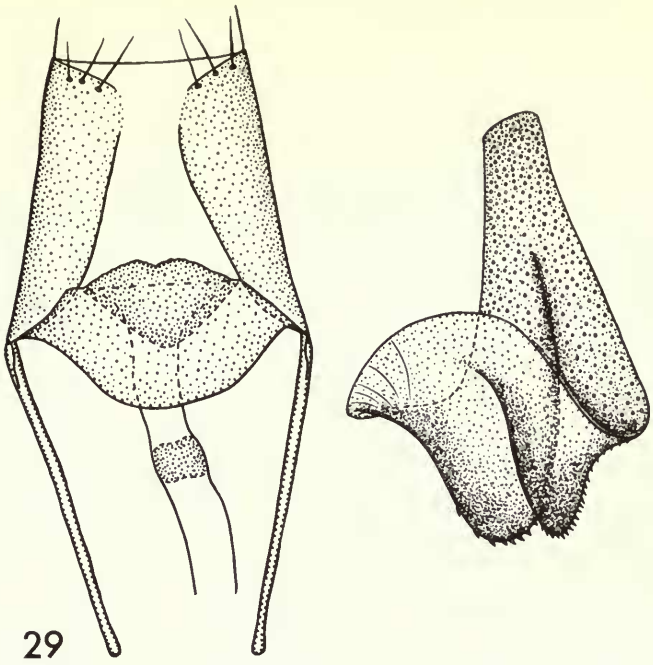


Fig. 29 *Deltophora stictella* (Rebel), ♀ genitalia. Spain, Andalucía (slide no. 12 730; BMNH).

The *korbi*-group

GENITALIA ♂. Uncus hook simple. Valva broad, distally not dilated. Sacculus small, not separated from valva. Juxta absent. Ductus ejaculatorius without sclerotized lamina.

GENITALIA ♀. Unknown.

DISTRIBUTION. E. Asia.

Deltophora korbi (Caradja, 1920) **comb. n.**

(Figs 30, 49, 74)

Teleia korbi Caradja, 1920, *Dt. ent. Z. Iris* **34** : 105. Holotype ♂, U.S.S.R.: Khabarovsk, Kazakevicha ('Kasakewitsch'), [1907 (*Korb*)] (genitalia slide no. 1075; MINGA, Bucharest) [examined].
[*Aristotelia maculata* (Staudinger); Meyrick, 1925 : 47 (partim). Misidentification.]
Aristotelia korbi (Caradja) Gaede, 1937 : 62.

♂. 5·5 mm. Head ochreous. Labial palpus as head; second segment unmarked; third segment with apex and broad ring around middle brown. Antenna dark brown, with light rings above. Thorax dark brown. Tegula with brown base and lighter apex. Fore wing greyish brown with dark markings: small spots on costa at base, one-fifth and three-fifths; plical spot at one-fifth, not extended to dorsal margin; discal spot big, round, not extended to dorsal margin; spot at end of cell distinct, not extended to tornus. Apical portion of wing dark.

GENITALIA ♂ (Figs 30, 74). Uncus hook simple, as long as tegumen. Anterior margin of tegumen with wide triangular emargination. Valva broad, margins almost parallel; costal margin with obtuse angle near base, distal four-fifths almost straight; distal margin concave between apex and rounded projection at ventro-distal angle of valva. Sacculus not separated from valva, reduced to narrow setose fold on basal third of valva. Sacculus smaller than tegumen. Basal two-thirds of aedeagus inflated, sclerotized; dorsal portion of apical third membranous, ventral portion sclerotized, with strong thorn. Ductus ejaculatorius without sclerotized lamina.

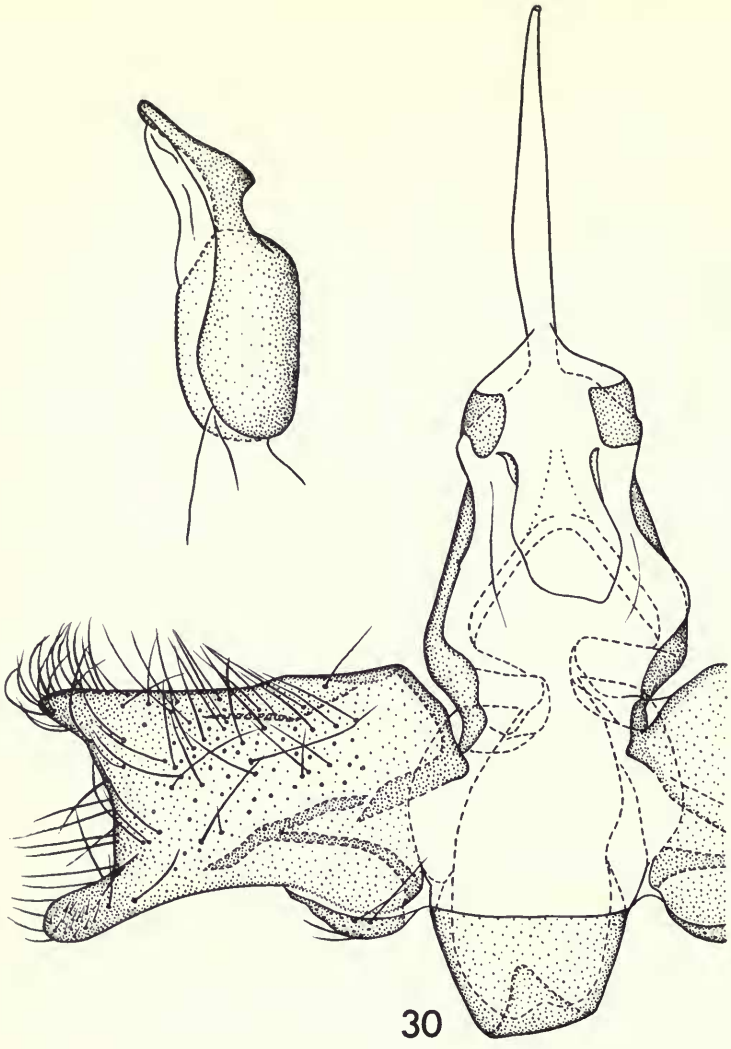


Fig. 30 *Deltophora korbi* (Caradja), ♂ genitalia. Holotype. U.S.S.R., Khabarovsk (slide no. 1075; MINGA, Bucharest).

GENITALIA ♀. Unknown.

REMARKS. In the left hind wing the veins *RR* and M_1 are separate whereas they sit on a short common stalk in the right wing.

D. korbi differs externally from *maculata* by the broader wings and the fore wing markings. The big, rounded discal spot does not reach the dorsal margin; the smaller spot at the end of the cell is isolated (as in *stictella*) and not extended to the tornus. As in *stictella*, the ochreous head contrasts with the brown thorax and greyish brown fore wings, thereby differing from *maculata*. The apex of the hind wing is shorter than in *maculata*; however, the hind wing of the holotype is slightly folded below the apex, which therefore appears a little shorter in Fig. 49 than it is in reality. The ♂ genitalia do not resemble closely those of any other *Deltophora* species.

The type-locality is situated 40 km south-west of Khabarovsk, at the head of the two branches by which the Ussuri river joins the Amur river. According to Caradja (1910 : 106) the holotype was collected by M. Korb in 1907.

Caradja described *korbi* as 'nov. sp. aut var. [of *maculata*]'; Meyrick (1925 : 47) placed it as a doubtful synonym of *maculata*; Gaede (1937 : 62) recorded it correctly as a separate species.

BIOLOGY. Host-plant unknown. No date of capture is recorded for the holotype.

DISTRIBUTION. U.S.S.R. (Khabarovsk).

The *glandiferella*-group

GENITALIA ♂. Uncus hook simple. Valva subtriangular, with angled ventral margin. Sacculus composed of two weak lobes. Juxta absent. Ductus ejaculatorius without sclerotized lamina.

GENITALIA ♀. Posterior margin of seventh abdominal segment with or without pair of pleural pits. Apophyses anteriores inserted medially on anterior margin of eighth sternite near ostium bursae. Inner surface of corpus bursae without spines. Signum of typical shape: strongly curved or almost straight hook.

DISTRIBUTION. N. America.

Deltophora sella (Chambers, 1874) comb. n., sp. rev.

(Figs 33, 50–52, 61, 75–77, 98–100, Map 1)

Gelechia sella Chambers, 1874 : 238.

♂, ♀. 5·0–7·0 mm. Head grey-brown, sometimes light brown or ochreous, speckled; dark brown along margin of eye between base of proboscis and antenna. Labial palpus densely speckled with dark brown scales on outer and sometimes ventral surface of first and second segments; second segment with light ring at apex; third segment light, apex and irregular ring around middle brown. Antenna brown, with paler rings above. Thorax grey with pair of dark spots on lateral margin of mesoscutellum; sometimes also with dark longitudinal line on anterior half of thorax. Tegula grey with dark brown base. Fore wing grey or brownish grey, with or without dark markings.

GENITALIA ♂ (Figs 33, 61, 75–77). Length of individual scales of posterior pair of coremata about 35 times their greatest width. Uncus hook simple, narrow at base, widest in posterior half near middle. Anterior margin of tegumen with wide emargination. Valva broad, distally rounded, ventral margin extended in middle to form angle which terminates in short spine. Sacculus divided into two weak lobes; dorsal lobe large, rounded, not clearly separated from valva; ventral lobe much smaller. Saccus broad, rounded. Apical portion of aedeagus as long as its bulbous base, narrow, with strong ventral thorn.

GENITALIA ♀ (Figs 98–100). Posterior margin of seventh abdominal segment without pair of pleural pits. Apophysis anterior one-third to one-half length of apophysis posterior, inserted medially near ostium bursae, pointing outwards. Eighth sternite sclerotized around most of ostium bursae, narrow zone between ostium bursae and posterior margin of sternite membranous. No sclerotized antrum. Posterior part of ductus bursae with sclerotized ring near ostium bursae. Ductus bursae with narrow posterior portion; anterior section gradually widened into elongate corpus bursae. Signum in anterior part of corpus bursae; composed of long, slender, gently and evenly curved spine which arises from narrow sclerotization of bursa wall.

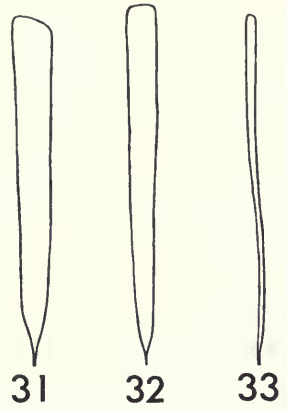
REMARKS. *D. sella* is similar to *glandiferella* and consistently has been synonymized with it.

The ♂ genitalia resemble those of *glandiferella* but in *sella* the scales of the posterior pair of coremata are narrower, hair-like, the base of the uncus is narrow, the valva is longer and more ovoid and its apical margin never bears a small sclerotized thorn; the ventral angle of the valva bears a short spine, whereas in *glandiferella* there is a rectangular or quadrangular sclerotization on the distal side of the ventral angle. In dorso-ventral view the apical portion of the aedeagus is narrower in *sella*, with only one strong ventral thorn, whereas in *glandiferella* it is wider and bears a pair of ventral thorns.

The ♀ genitalia of *sella* are similar to those of *glandiferella* in the medially inserted apophyses anteriores which are directed outwardly. The bases of the apophyses anteriores are not as close as in *glandiferella* and never bent. In *sella* there is no sclerotized antrum developed and the ostium bursae is not completely sclerotized; a wide membranous zone extends between ostium bursae and posterior margin of the eighth sternite. The spine of the signum is gently curved and longer, whereas in *glandiferella* it is strongly curved and stouter. In *glandiferella* the spine of the

signum is connected to a scobinate sclerotization of the bursa wall, which runs parallel to the longitudinal axis of the corpus bursae, whereas in *sella* the spine is connected to a narrow sclerotization which is not scobinate and lies at right angles to the longitudinal axis of the corpus bursae.

The Californian subspecies *californica* differs from the nominate form of *sella* by the discal spot which is extended to the dorsal margin of the fore wing. The subspecies *atacta* differs from the nominate form by the absence or near absence of dark wing markings.



Figs 31–33 Scales of posterior pair of coremata. 31, 32, *Deltophora glandiferella* (Zeller). 33, *D. sella* (Chambers).

Chambers (1877 : 14) synonymized *sella* with *glandiferella* and it has remained in synonymy, although Busck (1903 : 789) believed it to be a distinct species. Most literature records of *glandiferella* apply, at least in part, to *sella*, which is the more widespread species in the U.S.A. It seems likely that the records of *glandiferella* from Massachusetts (Jones & Kimball, 1943 : 171) and Connecticut to Kansas (Forbes, 1923 : 293) refer to *sella*.

Biology. Host-plant unknown. Moths have been collected in March–September and November.

Distribution. U.S.A. (North Carolina, Florida, Arkansas, Texas, California).

Deltophora sella sella (Chambers, 1874) **comb. n.**

(Figs 50, 75, 98, 99, Map 1)

Gelechia sella Chambers, 1874, *Can. Ent.* **6** : 238. LECTOTYPE ♂, U.S.A.: Texas (*Chambers*) (genitalia slide no. 712, Sattler; MCZ, Cambridge, Mass.), here designated [examined].

[*Gelechia glandifuella* Zeller; Chambers, 1877 : 14. Incorrect subsequent spelling of *glandiferella* Zeller. Misidentification.]

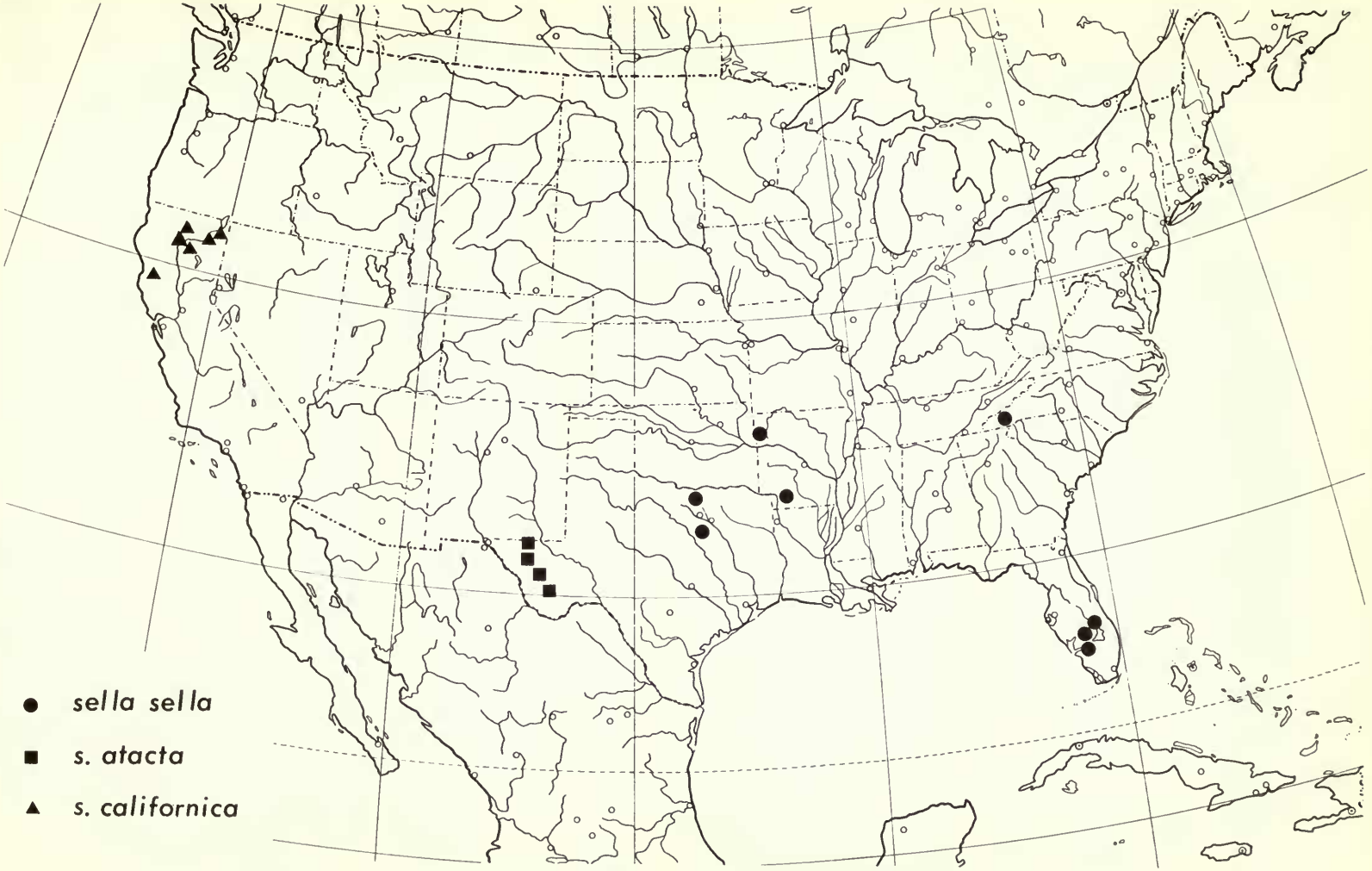
♂, ♀. 5·0–6·0 mm. Fore wing grey with black markings: black spot in fold near base; large discal spot in middle of wing not extended to dorsal margin; small spot at end of cell. Indistinct light spot on costa at three-quarters, rarely extended across wing to tornus. Apex of wing sometimes darker grey.

Genitalia ♂ (Fig. 75). As described on p. 293.

Genitalia ♀ (Figs 98, 99). As described on p. 293.

Remarks. In *sella sella* the discal spot of the fore wing is isolated, whereas in *glandiferella* and *sella californica* it is extended to the dorsal margin.

G. sella was described from an unspecified number of specimens (sex not stated in the original description), which were collected by Chambers during the months of July and September in Texas. It is clear from the original description that Chambers had a mixed series of two species,



Map 1 Distribution of *Deltophora sella* (Chambers) and its subspecies (based on examined specimens).

viz *sella* s. str. and *glandiferella* Zeller: ' . . . a dark brown dorsal streak, extending more than half across the wing, perpendicular to the margin, placed before the middle [*glandiferella*], but sometimes it is represented only by a triangular spot on the fold, and which does not touch the margin [*sella*]; . . .'. In the Chambers coll. (MCZ, Cambridge, Mass.) there are five original specimens, bearing the following labels: 'Type 1481', 'Chambers, Texas', '*Gelechia sella* Chamb.'. A ♂ without head (genitalia slide no. 712, Sattler) is here designated as the lectotype. The remaining four specimens have been labelled as paralectotypes; however, they are not conspecific with the lectotype but belong to *glandiferella* Zeller. A sixth specimen in the Chambers coll., also labelled 'Type 1481', is excluded from the type-series on account of its date of capture '10/8'. This specimen is conspecific with the lectotype. An original Chambers specimen (♀, without abdomen) in the NMNH, Washington, now also labelled as a paralectotype, belongs to *glandiferella*.

Biology. Host-plant unknown. Moths have been collected in March–September.

Distribution. U.S.A. (North Carolina, Florida, Arkansas, Texas). It seems likely that all records of *glandiferella* from the eastern U.S.A. belong to *sella sella* (see p. 300).

Material examined.
U.S.A.: 1 ♀, North Carolina, 1882 (*Morrison*) (BMNH); 1 ♀, North Carolina, Macon Co., Highlands, 1150 m ('3865 feet'), 6.vii.1958 (*Hodges*) (NMNH, Washington); 2 ♂, 8 ♀, Florida, Lake Placid, Archbold Biological Station, 28.iii–4.iv.1959, 30.iv–31.v.1964 (*Hodges*) (NMNH, Washington); 1 ♀, Florida, Highlands Co., Parker Island, 26–29.v.1964 (*Hodges*) (NMNH, Washington); 1 ♂, Florida, Fisheating Creek, Palmdale, 7–10.v.1964 (*Hodges*) (NMNH, Washington); 1 ♂, 4 ♀, Arkansas, Washington Co., Devil's Den State Park, 15–18.vi.1966 (*Hodges*) (NMNH, Washington); 2 ♂, Arkansas, Hempstead Co., Hope, vii, ix.1925 (collector unknown) (BMNH); 1 ♂, Texas, 10.viii (*Chambers*) (MCZ, Cambridge, Mass.); 1 ♂, 1 ♀, Texas, [Montague Co.,] Forestburg, vii.1927, viii.1926 (collector unknown) (BMNH); 1 ♀, Texas, Bosque Co., 20.v.1876 (*Belfrage*) (BMNH); 2 ♂, Texas (*Beutenmüller*) (NMNH, Washington).

Deltophora sella atacta (Meyrick, 1927) **comb. n., stat. n.**

(Figs 51, 61, 76, Map 1)

Aristotelia atacta Meyrick, 1927, *Exot. Microlepidopt.* **3** : 343. Lectotype ♂, U.S.A.: Texas, Brewster Co., Alpine, 1550 m ('5000 feet'), iv.1926 (collector unknown) (genitalia slide no. 5665, Clarke; BMNH), designated by Clarke (1969*a* : 277) [examined].
Aristotelia atacta Meyrick; Gaede, 1937 : 46.
Aristotelia atacta Meyrick; Clarke, 1969*a* : 277, pl. 137, figs 4–4c.

♂. 6·5–7·0 mm. No dark spots on mesoscutellum but dark longitudinal line sometimes present on anterior half. Fore wing pure grey, wing markings reduced: no spots at base; plical, discal and spot at end of cell very small, discal spot slightly distad of plical.

Genitalia ♂ (Figs 61, 76). As described on p. 293.

Genitalia ♀. Unknown.

Remarks. In some specimens of *atacta* the three fore wing spots are completely absent. *D. sella atacta* differs from the nominate subspecies by the larger size, the purer grey colour and the strongly reduced wing markings. It differs from *sella californica* by the grey colour and the reduced fore wing markings; however, reduction of wing markings is occasionally also found in specimens of *californica*.

A. atacta was described from 4 ♂ collected in April, 1926, in Texas. All four specimens were available to me for study. The lectotype was labelled and designated by Clarke (1969*a* : 277); the remaining three specimens (one in BMNH, two in NMNH, Washington) have now been labelled as paralectotypes.

Biology. Host-plant unknown. Moths have been collected in April, May, July and November.

Distribution. U.S.A. (south-western Texas).

Material examined.
U.S.A.: 3 ♂, Texas, Brewster Co., 1550 m ('5000 feet'), 2150 m ('7000 feet'), iv.1926 (collector unknown)

(BMNH; NMNH, Washington) (paralectotypes); 1 ♂, Texas, Brewster Co., 2150 m ('7000 feet'), vii.1926 (collector unknown) (BMNH); 1 ♂, Texas, Jeff Davis Co., Fort Davis, 1550 m ('5000 feet'), xi.1927 (collector unknown) (BMNH); 1 ♂, Texas, Culberson Co., Guadalupe mountains, McKittrick Canyon, 1550 m ('5000 feet'), 23.v.1973 (*Hodges*) (NMNH, Washington); 12 ♂, Texas, Culberson Co., Sierra Diablo, 32 km ('20 miles') N.N.W. of Van Horn, 1800 m ('6000 feet'), 26–29.v.1973 (*Hodges*) (NMNH, Washington).

Deltophora sella californica subsp. n.

(Figs 52, 77, 100, Map 1)

[*Telphusa glandiferella* (Zeller); Walsingham, 1911 : 58 (partim). Misidentification.]

♂, ♀. 6·0–7.0 mm. Wing colour brownish grey, fore wing markings dark brown with fine ochreous border. Dark spot at base of fold, big discal spot extended to dorsal margin of fore wing; minute spot at end of cell.

GENITALIA ♂ (Fig. 77). As described on p. 293.

GENITALIA ♀ (Fig. 100). As described on p. 293.

REMARKS. In a number of specimens the fore wing markings are weak and indistinct. In a few specimens the dark spot in the middle of the fore wing is reduced and does not reach the dorsal margin. In one specimen it is divided into a larger plical and a smaller discal spot, thereby resembling the subspecies *atacta*.

D. sella californica differs from the nominate subspecies by the larger size, the more brownish wing colour and the wing markings with the dark spot in the middle of the fore wing reaching the dorsal margin. In this last character *californica* agrees with *glandiferella* and *duplicata*, from both of which it can be separated by the genitalia of both sexes and by the distribution.

Some information on Walsingham's collecting sites in California was published by Essig (1941).

BIOLOGY. Host-plant unknown. Moths have been collected by Walsingham in June–September.

DISTRIBUTION. U.S.A. (California).

Kiefer (1933 : 358) recorded *glandiferella* from California. I was unable to locate his specimens; however, it seems likely that they are *sella californica*.

MATERIAL EXAMINED.

Holotype ♂, **U.S.A.**: California, Shasta Co., Pit River, 21–26.vii.1871 (*Walsingham*) (genitalia slide no. 16 377; BMNH).

Paratypes. **U.S.A.**: 2 ♂, 3 ♀, California, Siskiyou Co., Mt Shasta, 2.viii–1.ix.1871 (*Walsingham*) (BMNH); 1 ♂, California, Siskiyou Co., McCloud's Creek, 29–30.vii.1871 (*Walsingham*) (BMNH); 1 ♂, California, Modoc Co., Davis Creek, 18.viii.1930 (collector unknown) (BMNH); 1 ♀, California, Shasta Co., Pit River, 21–26.vii.1871 (*Walsingham*) (BMNH); 1 ♂, California, Shasta Co., Hatchet Creek, 14–17.vii.1871 (*Walsingham*) (BMNH); 2 ♂, 5 ♀, California, Mendocino Co., Head of Noyo River, 8–11.vi.1871 (*Walsingham*) (BMNH).

Deltophora glandiferella (Zeller, 1873) comb. n.

(Figs 31, 32, 34, 53, 64, 78, 101, 102)

Gelechia (*Anacampsis*) *glandiferella* Zeller, 1873, *Verh. zool.-bot. Ges. Wien* **23** : 275, pl. 4, fig. 25. LECTOTYPE ♂, U.S.A.: Texas, Dallas Co., [1870] (*Boll*) (genitalia side no. 7356; BMNH), here designated [examined].

[*Gelechia sella* Chambers, 1874 : 238 (partim). Misidentification.]

Gelechia glandifuella Zeller; Chambers, 1877*a* : 14 (partim). Incorrect subsequent spelling of *glandiferella* Zeller.

Gelechia glandifera Zeller; Chambers, 1877*b* : 24. Incorrect subsequent spelling of *glandiferella* Zeller.

Gelechia glandiferella Zeller; Chambers, 1878 : 144 (partim).

Gelechia glandiferella Zeller; Hagen, 1884 : 99.

Gelechia glandiferella Zeller; Frey, 1884 : 99 (partim).

Gelechia glandiferella Zeller; Riley, 1891 : 101 (partim).

[*Gelechia*] *glandiferella* Zeller; Busck, 1902 : 93 (partim).

Telphusa glandiferella (Zeller) Busck, 1903 : 788 (partim).
Telphusa glandiferella (Zeller); Busck, [1903] : 497 (partim).
Telphusa glandiferella (Zeller); Kearfott, 1903 : 109 (partim).
Telphusa glandiferella (Zeller); Barnes & McDunnough, 1917 : 154 (partim).
Telphusa glandiferella (Zeller); Forbes, 1923 : 292, 293 (partim).
Telphusa glandiferella (Zeller); Meyrick, 1925 : 70 (partim).
Telphusa glandiferella (Zeller); Gaede, 1937 : 125 (partim).
Telphusa glandiferella (Zeller); McDunnough, 1939 : 68 (partim).

♂, ♀. 5·0–7·0 mm. Head grey-brown to ochreous, speckled with dark brown; some dark brown scales along margin of eye between base of proboscis and antenna. Labial palpus grey-brown to ochreous, outer surface of first and second segments dark brown; second segment with light ring at apex; third segment light, apex and ring around middle dark brown. Antenna grey-brown, with paler rings above. Thorax grey-brown, apex of mesoscutellum and pair of spots on lateral margin dark brown. Tegula grey-brown or ochreous, basal half dark brown. Fore wing grey or grey-brown, with black markings: black spot in fold near base; large discal spot in middle of wing extended to dorsal margin; small spot at end of cell. Dark markings sometimes lined with ochreous. Sometimes very small indistinct dark spots on costa.

Genitalia ♂ (Figs 31, 32, 34, 78). Length of individual scales of posterior pair of coremata about 10 times their greatest width. Uncus hook simple, narrow, widest at base, tapered posteriorly. Anterior margin of tegumen with wide emargination. Valva broad, apex evenly rounded, often with short sclerotized thorn. Ventral margin of valva extended to form obtuse angle; small angular sclerotization on distal side of angle. Sacculus divided into two weak, irregularly shaped lobes; dorsal lobe clearly separated from valva, usually larger than ventral lobe. Saccus broad, rounded. Apical portion of aedeagus as long as its bulbous base, with pair of strong ventral thorns.

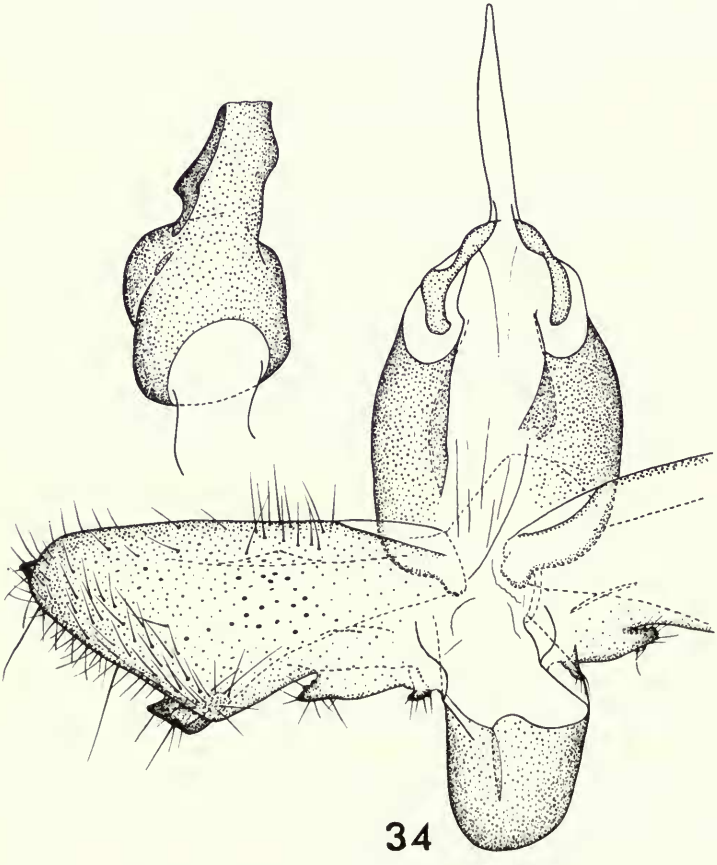


Fig. 34 *Deltophora glandiferella* (Zeller), ♂ genitalia. Lectotype. U.S.A., Texas (slide no. 7356; BMNH).

GENITALIA ♀ (Figs 101, 102). Posterior margin of seventh abdominal segment with pair of shallow pleural pits. Apophysis anterior one-third to one-half length of apophysis posterior, inserted medially on anterior margin of eighth sternite, close to ostium bursae. Inner basal branch of apophysis anterior extended as narrow fold behind ostium bursae; outer basal branch sometimes extended in gentle arc to centre of eighth sternite. Apophysis anterior strongly bent outwards near base. Sclerotized antrum short, rounded, posterior margin of ventral antrum wall with deep emargination. Posterior part of ductus bursae with sclerotized ring near antrum. Ductus bursae with narrow posterior portion; anterior portion gradually widened into elongate corpus bursae. Signum in posterior part of corpus bursae, composed of curved, stout spine which arises from scobinate longitudinal sclerotization of bursa wall.

REMARKS. The distal portion of the valva is variable. The apical margin is usually, but not always, evenly rounded and sometimes bears a small tooth or other sclerotization. Seen laterally the two ventral thorns on the apical portion of the aedeagus may appear as one.

The ♀ genitalia share with those of *sella* the medially inserted and outwardly directed apophyses anteriores. For differences see *sella* (p. 293). The apophyses anteriores are bent near their base to a varying degree; rarely they are straight as in *sella*. The inner basal branches of the apophyses anteriores extend behind the ostium bursae but do not quite meet medially, leaving a narrow membranous gap. There is usually no outer basal branch visible; however, sometimes a gently curved stronger sclerotization extends from the base of the apophyses anteriores to the centre of the eighth sternite. The sclerotization of the eighth sternite is often weak and the membranous and sclerotized areas are usually not clearly separated. Sometimes there is a large, transverse, membranous area behind the ostium bursae, followed by a narrow, longitudinal, membranous zone which extends to the posterior margin of the sternite.

D. glandiferella was described from an unspecified number of specimens of both sexes, collected in Texas by Boll and Belfrage. Zeller specifically mentioned four ♀ collected on 27.vii, 7 and 27.viii. Material collected by Boll in Dallas Co. in 1870, usually without recorded dates of capture, was made available to Zeller by Hagen. The above lectotype bears Zeller's green label [green labels were Zeller's code for the American fauna] '*Gelechia glandiferella*, Texas, H[a]g[en]. [18]71.', indicating that Zeller had received the specimen from Hagen in 1871. Material collected by Belfrage in Texas, usually with recorded dates of capture, was made available to Zeller by Stainton and Loew. In coll. Zeller (BMNH) there are two ♀ from Texas with dates 7.viii and 27.viii respectively. They bear Zeller's green label '*glandiferella*, Texas, L[oe]w. [18]71.'. A ♀ in NMNH, Washington, bears an identical Zeller label and was captured on 25.vii. It also bears a printed label 'From Boll Texas'; this is incorrect as the other labels indicate that the specimen was collected by Belfrage. Although the date does not agree with those cited in the original description, it is probably one of the original specimens. I have now labelled it as '? Paralectotype'. All three specimens lack the abdomens. For information on the origin of Zeller's material see Zeller (1872 : 449–450).

Riley (1891 : 101, no. 5382) erroneously placed *pallidochrella* Chambers as a synonym of *glandiferella*, but at the same time (loc.cit. : 102, no. 5439) recorded it as a valid species. This error was corrected and discussed in detail by Busck (1902 : 93).

D. glandiferella is externally very similar to *sella californica* and *duplicata* but can be distinguished by the genitalia. The differences to *sella* and its subspecies *californica* are discussed on p. 293. In the *duplicata* ♂ the valva is rectangular rather than triangular and bears a pair of finger-like sclerotized processes. In the *duplicata* ♀ the apophyses anteriores are not inserted medially on the margin of the eighth sternite, the ductus bursae is shorter and much wider and bears a large sclerotization in its posterior part just before the colliculum. The spine of the signum is thinner and much longer than in *glandiferella*.

BIOLOGY. Host-plant unknown. Moths have been collected in April–August and October.

DISTRIBUTION. U.S.A. (Texas); Mexico (Coahuila, Nuevo Leon, Tamaulipas).

Walsingham, followed by several authors, recorded *glandiferella* from California, Mexico and the West Indies. Re-examination of the material concerned has revealed the following misidentifications: California (Walsingham, 1911 : 58) – *sella californica*; Mexico (Walsingham, 1911 : 58)

– *flavocincta* [it should, however, be noted that *glandiferella* is now known to occur in Mexico.]; West Indies (Walsingham, 1897 : 72; 1911 : 58) – *lanceella*.

I was unable to locate the specimens recorded from California by Keifer (1933 : 358); it seems likely that they also belong to *sella californica*.

In the U.S.A. *glandiferella* is only known with certainty from Texas; it seems likely that all records for the eastern U.S.A., e.g. Massachusetts (Jones & Kimball, 1943 : 171) and Connecticut to Kansas (Forbes, 1923 : 293) refer to *sella* (see p. 296).

Material Examined.

U.S.A.: 3 ♂, 2 ♀, Texas (*Chambers*) (MCZ, Cambridge, Mass.; NMNH, Washington) (paralectotypes of *G. sella* Chambers); 1 ♀, Texas, [Montague Co.,] Forestburg, viii.1927 (collector unknown) (BMNH); 1 ♀, Texas, Bosque Co., 25.x.1876 (*Belfrage*) (BMNH); 13 ♂, 5 ♀, Texas, Brewster Co., 1550, 2150, 2450 m ('5000 feet', '7000 feet', '8000 feet'), iv, v, vii.1926 (collector unknown) (BMNH); 2 ♂, Texas, Brewster Co., Chisos mountains, Panther Pass, 1800 m ('6000 feet'), 2.vi.1973 (*Hodges*) (NMNH, Washington); 1 ♂, 1 ♀, Texas, Brewster Co., Chisos mountains, K-Bar Ranch, 1000 m ('3400 feet'), 5.vi.1973 (*Hodges*) (NMNH, Washington); 1 ♂, Texas, Culberson Co., Sierra Diablo, 32 km ('20 miles') N.N.W. of Van Horn, 1800 m ('6000 feet'), 29.v.1973 (*Hodges*) (NMNH, Washington); 1 ♂, Texas, [Kerr Co.,] Kerrville (collector unknown) (NMNH, Washington); 1 ♂, Texas (*Beutenmüller*) (NMNH, Washington). **Mexico**: 1 ♂, Coahuila, 16 km ('10 miles') N. of Monclova, 450 m ('1500 feet'), 7.vii.1963 (*Duckworth & Davis*) (NMNH, Washington); 3 ♂, 1 ♀, Nuevo Leon, Anegade Arroya, 26 km ('16 miles') S. of Linares, 400 m ('1250 feet'), 9.vii.1963 (*Duckworth & Davis*) (NMNH, Washington); 1 ♀, Tamaulipas, 3 km ('2 miles') N. of Tamazunchale, 120 m ('400 feet'), 16–18.vii.1963 (*Duckworth & Davis*) (NMNH, Washington); 1 ♀, Tamaulipas, 9·5 km ('6 miles') S. of Ciudad Victoria, 300 m ('1050 feet'), 6.viii.1963 (*Duckworth & Davis*) (NMNH, Washington).

The *flavocincta*-group

Genitalia ♂. Eighth tergite sometimes specialized (see also p. 271). Uncus simple or dilated. Sometimes a weakly sclerotized subscaphium present. Valva of various shape, with or without digitate processes near base. Sacculus small, not clearly separated from valva. Sclerotized juxta usually present. Ductus ejaculatorius without sclerotized lamina.

Genitalia ♀. Posterior margin of seventh abdominal segment with or without pleural pits. Ventral branch of apophysis anterior extended into ostium bursae. Ductus bursae sometimes with sclerotization anterior to colliculum. Corpus bursae with or without minute spines. Signum usually a large hook with compressed apical portion.

Distribution. N. America (Florida); Central America; northern parts of S. America.

Deltophora flavocincta sp. n.

(Figs 54, 79, 103, 104)

[*Telphusa glandiferella* (Zeller); Walsingham, 1911 : 58 (partim). Misidentification.]

♂, ♀. 5·0–6·0 mm. Head ochreous, speckled with dark brown, particularly on vertex, along margin of eye and at base of antenna. Labial palpus ochreous, outer surface of first and second segments dark brown; second segment with light ring at apex; third segment with dark apex and broad, dark ring around middle. Antenna brown with paler rings above. Thorax ochreous with broad, dark, longitudinal band, pair of dark lateral spots and dark apex of mesoscutellum. Tegula ochreous, basal half dark brown. Fore wing ochreous, paler than head, with black markings: small spot in fold, near base, extended towards dorsal margin; large discal spot extended to dorsal margin, widest on margin; sometimes minute spot at end of cell; dark shadow on third quarter of costa. Dark markings sometimes lined with ochreous scales. Apical portion of wing light, not darker than basal area.

Genitalia ♂ (Fig. 79). Uncus hook as long as tegumen, medially slightly dilated, apical quarter thin. Anterior margin of tegumen medially with wide emargination. Anal tube with long, narrow subscaphium. Valva distally dilated; costal margin strongly convex, ventral margin straight; band along costal and distal margin set with long setae, nose-like apex free of setae. Sacculus only about one-third length of valva, set with very long setae. Base of sacculus extends as more strongly sclerotized fold across basal third of valva and nearly reaches costal margin. Juxta almost rectangular, strongly sclerotized. Basal

two-thirds of aedeagus inflated, sclerotized; dorsal portion of apical third membranous, ventral portion sclerotized, with pair of strong ventral thorns. Ductus ejaculatorius without sclerotized lamina.

GENITALIA ♀ (Figs 103, 104). Apophysis posterior 3 times length of apophysis anterior. Eighth sternite membranous, between anterior margin and ostium bursae weakly sclerotized, anterior margin strongly convex. Ostium bursae at anterior third of eighth sternite. Antrum a large, anteriorly rounded pouch; posterior margin with V-shaped emargination. Ventral branch from base of apophysis anterior reaches posterior edge of antrum. Colliculum close to antrum. Ductus bursae about 3 times length of apophysis posterior, with one loop; at entrance of corpus bursae about 4 to 5 times as wide as at colliculum. Corpus bursae oval, inner surface with minute spines in posterior part extending into extreme anterior portion of ductus bursae. Signum composed of flat blade with serrated edge and narrower basal arm which branches off at right angles.

REMARKS. *D. flavocincta* is lighter and more ochreous than its related species. The ♂ genitalia differ from those of *lanceella*, *caymana* and *minuta* by the narrow uncus, from *duplicata* by the absence of the digitate processes of the valva. The ♀ genitalia are closest to those of *lanceella* but differ by the shorter apophyses anteriores, the much longer ductus bursae with one loop, and the shorter, more robust signum.

BIOLOGY. Host-plant unknown. Moths have been collected in February and June–August at altitudes of 300–600 m.

DISTRIBUTION. Mexico (Tamaulipas, Tabasco); Colombia (Magdalena).

MATERIAL EXAMINED.

Holotype ♂, **Colombia**: Magdalena, Sierra Nevada de Santa Marta, Minca, 600 m ('2000 feet'), vi.1899 (*Smith*) (genitalia slide no. 14 816; BMNH).

Paratypes. **Mexico**: 2 ♂, Tamaulipas, 9·5 km ('6 miles') S. of Ciudad Victoria, 300 m ('1050 feet'), 6.viii.1963 (*Duckworth & Davis*) (NMNH, Washington); 1 ♂, 6·5 km ('4 miles') S.W. of Ciudad Victoria, 350 m ('1100 feet'), 10.vii.1963 (*Duckworth & Davis*) (NMNH, Washington); 1 ♀, Tabasco, Teapa, ii.18 [??] (*Smith*) (BMNH). **Colombia**: 1 ♂, 2 ♀, Magdalena, Sierra Nevada de Santa Marta, Minca, 600 m ('2000 feet'), vi.1899 (*Smith*) (BMNH).

Deltophora duplicata sp. n.

(Figs 13, 58, 62, 80, 105, 106)

♂, ♀. 4·5–5·5 mm. Head grey-brown, speckled with darker brown, particularly on vertex; dark brown scales along margin of eye. Labial palpus whitish grey or ochreous, outer surface of first and second segments dark brown; second segment with light ring at apex; third segment with dark apex and irregular dark ring around middle. Antenna dark brown, with lighter rings above. Thorax grey-brown, middle sometimes darker, pair of dark lateral spots sometimes indistinct, apex of mesoscutellum dark. Tegula grey-brown, basal two-thirds dark brown. Fore wing grey, grey-brown or pale ochreous, with black markings: plical spot and discal spot both extended to dorsal margin; minute spot at end of cell, not extended to tornus. Base of costa dark, small dark spot on basal fifth, sometimes indistinct dark shadow on third quarter of costa. Dark wing markings sometimes lined with ochreous scales.

GENITALIA ♂ (Figs 13, 62, 80). Eighth tergite specialized, scale bases concentrated medially in posterior two-thirds. Anterior pair of coremata short, about length of two abdominal segments (twice length of posterior pair), composed of tuft of long, hair-like scales and group of strong, heavily sclerotized scales, one of which exceeds others in length and is characteristically curled below apex (Fig. 13). Posterior pair of coremata composed of broad scales; length of individual scale about 3 times its greatest width. Uncus hook simple, as long as tegumen. Anterior margin of tegumen medially with wide trapezoidal emargination. Valva about twice as long as wide, margins almost straight, parallel; costal and distal margins meet at obtuse angle; ventro-distal corner extended to short, nose-like apex. Short digitate process near centre of valva; longer, slightly curved process on ventral margin, near base. Valva almost entirely covered with long setae. Sacculus much reduced, divided; dorsal part more strongly sclerotized, margin slightly convex, with group of long setae; ventral part smaller, weakly sclerotized, margin with three shorter setae. Small sclerotized juxta present. Saccus as large as tegumen. Basal third of aedeagus inflated; apical two-thirds membranous, supported by ventral sclerotization which bears pair of short teeth near middle. Ductus ejaculatorius without sclerotized lamina.

Genitalia ♀ (Figs 105, 106). Apophysis posterior twice length of apophysis anterior. Posterior part of eighth sternite membranous, anterior part sclerotized, anterior margin medially strongly convex. Ventral branch from base of apophysis anterior strongly recurved at ostium bursae and extended into antrum. Ostium bursae in middle of eighth sternite, ventral margin convex. Ventral surface of antrum with tapered sclerotization. Colliculum very close to antrum. Ductus bursae about as long as apophysis posterior, at entrance of corpus bursae 3 to 4 times as wide as at colliculum, with lateral sclerotization in posterior half. Corpus bursae spherical or oval. Signum strongly curved, pointed, with small base plate branching off at right angles; basal half tubular, apical half compressed, strongly curved; one edge serrate.

Remarks. *D. duplicata* is characterized externally by the strong plical spot which reaches the dorsal margin of the fore wing. The ♂ genitalia differ from those of all other species by the two digitate processes of the valva; the ♀ genitalia differ by the sclerotization of the ductus bursae anterior to the colliculum. The only other species with a similar sclerotization, *minuta*, differs from *duplicata* by the straight apical portion of the signum.

Biology. Host-plant unknown. Moths have been collected in February, May, July and August.

Distribution. U.S.A. (Florida); Cayman Islands; Mexico (Tamaulipas); El Salvador.

Material examined.

Holotype ♂, **Cayman Islands**: Grand Cayman, West end of Georgetown, 3.viii.1938 (*Lewis & Thompson*) (genitalia slide no. 14 829; BMNH).

Paratypes. **U.S.A.**: 1 ♂, 2 ♀, Florida, Lake Placid, Archbold Biological Station, 1–7, 16–22.v.1964 (*Hodges*) (NMNH, Washington). **Mexico**: 1 ♂, Tamaulipas, 3 km ('2 miles') N. of Tamazunchale, 120 m ('400 feet'), 16–18.vii.1963 (*Duckworth & Davis*) (NMNH, Washington); 1 ♀, Tamaulipas, El Salto Falls, 42 km ('26 miles') W. of Antiguo Morelos, 600 m ('2000 feet'), 11–14.vii.1963 (*Duckworth & Davis*) (NMNH, Washington). **El Salvador**: 1 ♀, Quezaltepeque, 11.ii.1965 (*Duckworth*) (NMNH, Washington).

Deltophora lanceella sp. n.

(Figs 55, 81, 107, 108)

[*Xenolechia glandiferella* (Zeller) Walsingham, 1897 : 72. Misidentification.]
[*Telphusa glandiferella* (Zeller); Walsingham, 1911 : 58 (partim). Misidentification.]
[*Aristotelia peltosema* (Lower); Meyrick, 1925 : 47 (partim). Misidentification.]
[*Telphusa glandiferella* (Zeller); Meyrick, 1925 : 70 (partim). Misidentification.]
[*Aristotelia peltosema* (Lower); Gaede, 1937 : 69 (partim). Misidentification.]
[*Tephusa glandiferella* (Zeller); Gaede, 1937 : 125 (partim). Misidentification.]

♂, ♀. 5·0–5·5 mm. Head light brown or ochreous, speckled with darker brown; some dark scales on margin of eye. Labial palpus ochreous, outer surface of first and second segments dark brown; second segment with light ring at apex; third segment with dark apex and ring around middle. Antenna dark brown, with lighter rings above. Thorax light brown or ochreous, sometimes middle darker brown. Tegula ochreous with dark brown base. Fore wing grey-brown with black markings: spot in fold near base extended towards dorsal margin but normally not reaching it; large discal spot extended to dorsal margin; minute spot at end of cell; sometimes faint shadow on tornus; small spot at basal quarter and larger shadow on third quarter of costa. Wing with extended areas of ochreous scales, particularly around dark markings. Apical portion of wing not darker than basal area.

Genitalia ♂ (Fig. 81). Uncus broadly lanceolate with short sharp point, about as long as tegumen. Anterior margin of tegumen with wide triangular emargination which reaches middle. Valva pointed; costal margin straight between base and hump at two-thirds; apical third of valva tapered; ventral margin very gently curved with digitate process at base. Sacculus much reduced, composed of triangular sclerotized fold, which is joined to base of valva, and irregularly shaped membranous lobe. Juxta a narrow plate, twice as wide as long. Aedeagus sclerotized except for dorsal part, base inflated, ventral thorn or transverse ridge at apical third. Ductus ejaculatorius without sclerotized lamina.

Genitalia ♀ (Figs 107, 108). Apophysis posterior twice length of apophysis anterior. Posterior part of eighth sternite membranous, anterior part sclerotized, anterior margin convex. Ventral branch from base of apophysis anterior strongly recurved at ostium bursae and extended into antrum. Ostium bursae near middle of eighth sternite, ventral margin concave. Ventral surface of antrum with tapered or rounded sclerotization. Colliculum very close to antrum. Ductus bursae evenly dilated anteriorly, corpus bursae

not clearly separated. Signum strongly curved, pointed, small base plate branching off at right angles; basal half tubular, apical half compressed, strongly curved, one edge serrate.

REMARKS. *D. lanceella* differs from *caymana* and *minuta* by the larger size, from *flavocincta* by the grey (not ochreous) fore wings, from *duplicata* by the plical spot which does not reach the dorsal margin of the fore wing, and from *suffusella* by the distinct wing markings. The ♂ genitalia are closest to those of *minuta* but differ by the tapered valva; they differ from those of *caymana* by the shape of the uncus and valva and the presence of a digitate process on the ventral margin of the valva. In the ♀ genitalia the strongly curved signum with the long narrow apex distinguishes *lanceella* from all related species; *duplicata*, with a similar but shorter signum, has an additional sclerotization in the ductus bursae near the colliculum. In *lanceella* the structure of the eighth segment is similar to that of *flavocincta*; however, the latter has a shorter and wider signum and a much longer ductus bursae with one loop.

BIOLOGY. Host-plant unknown. Moths have been collected in January and February.

DISTRIBUTION. West Indies (Grenada); Guyana; Brazil (Pará).

MATERIAL EXAMINED.
Holotype ♂, **Guyana**: Bartica, i.1913 (*Parish*) (genitalia slide no. 13 862; BMNH).
Paratypes. **West Indies**: 2 ♀, Grenada, leeward side, Mount Gay Estate, [100 m ('300 feet'), 25–30.viii] (*Smith*) (BMNH). **Brazil**: 1 ♀, Amazons, Pará, ii.1893 (*Schulz*) (BMNH).

Deltophora caymana sp. n.

(Figs 56, 82)

♂. 3·5–4·0 mm. Head grey-brown, speckled with darker scales. Labial palpus mostly dark brown; second segment with light dorsum and narrow light ring at apex; third segment with light zones at one-third and two-thirds. Antenna dark brown, with lighter rings above. Thorax grey-brown. Tegula grey-brown, with dark brown base. Fore wing grey-brown, with black markings: discal spot narrow, extended to dorsal margin and nearly reaching costa; small spot at end of cell. Dark markings in places lined with ochreous.

GENITALIA ♂ (Fig. 82). Uncus broad, leaf-shaped, slightly longer than tegumen, about 2 to 3 times as long as wide. Anterior margin of tegumen medially with deep arcuate emargination which nearly reaches base of uncus. Valva hardly dilated distally, broad, about twice as long as wide; costal margin slightly curved at basal third, distal two-thirds almost straight; distal margin convex; ventro-distal corner extended ventrad to form strong thorn. Sacculus about half length of valva, not separated from its ventral margin. Juxta reduced to small sclerotization on posterior margin of saccus. Saccus broad, about size of tegumen. Basal half of aedeagus inflated, sclerotized; dorsal portion of apical half membranous, ventral portion sclerotized, with pair of strong thorns near middle. Ductus ejaculatorius without sclerotized lamina.

GENITALIA ♀. Unknown.

REMARKS. *D. caymana* is smaller than most *Deltophora* species; it differs from the equally small *minuta* by the darker wing colour. *D. duplicata*, the only other *Deltophora* known from the Cayman Islands, is bigger and differs by the strongly developed plical spot which reaches the dorsal margin of the fore wing. In the ♂ genitalia *caymana* is characterized by the broad, leaf-shaped uncus which distinguishes it from all other *Deltophora* species.

The four type-specimens are in rather poor condition.

BIOLOGY. Host-plant unknown. Moths have been collected in May and July.

DISTRIBUTION. Cayman Islands.

MATERIAL EXAMINED.
Holotype ♂, **Cayman Islands**: Grand Cayman, N. coast of N. side, hut road, 15.vii.1938 (*Lewis & Thompson*) (genitalia slide no. 20 693; BMNH).
Paratypes. **Cayman Islands**: 2 ♂, same data as holotype (BMNH); 1 ♂, Cayman Brac, W. end of Cotton-tree Land, 20.v.1938 (*Lewis & Thompson*) (BMNH).

Deltophora minuta sp. n.

(Figs 57, 83, 109, 110)

[*Aristotelia peltosema* (Lower); Meyrick, 1925 : 47 (partim). Misidentification.]
[*Aristotelia peltosema* (Lower); Gaede, 1937 : 69 (partim). Misidentification.]

♂, ♀. 3·5–4·0 mm. Head grey-brown, speckled, dark brown along margin of eye. Labial palpus pale ochreous to whitish; second segment mostly dark brown, with light ring at apex; third segment with dark ring around middle and some dark scales at apex. Antenna dark brown, with paler rings above. Thorax grey-brown to light brown. Tegula light brown with dark brown base. Fore wing grey-brown with black or dark brown markings: small spot in fold near base; large discal spot extended to dorsal margin; small spot at end of cell; dark spots on costa at base, one-quarter, shadow at three-quarters. Dark markings lined with ochreous scales. Apical portion of wing not darker than basal area.

Genitalia ♂ (Fig. 83). Uncus as long as tegumen, nearly as broad as valva; basal fifth evenly expanded, following two-fifths with parallel margins, apical two-fifths tapered. Anterior margin of tegumen medially with deep narrow emargination which reaches posterior quarter. Valva slightly narrower than uncus, with parallel margins, distally rounded, apex with strong spine; short hook at base of ventral margin. Sacculus reduced, not clearly separated from valva, composed of sclerotized dorsal and membranous ventral portion. Small sclerite on posterior margin of saccus may represent vestige of juxta. Saccus about as long as tegumen but narrower. Basal half of aedeagus inflated, sclerotized; dorsal portion of apical half membranous, ventral portion sclerotized, with pair of triangular teeth near base. Ductus ejaculatorius without sclerotized lamina.

Genitalia ♀ (Figs 109, 110). Apophysis posterior 3 times length of apophysis anterior. Posterior part of eighth sternite membranous, anterior part weakly sclerotized, raised to broad tongue below ostium bursae; anterior margin straight. Ostium bursae in middle of eighth sternite. Antrum membranous with pair of sclerotized plates. Colliculum at posterior third of ductus bursae; narrow sclerotization extends between colliculum and entrance of corpus bursae. Ductus bursae about length of apophysis posterior, anteriorly not dilated. Corpus bursae pear-shaped, inner surface of anterior half with minute spines. Signum long, straight, with rounded apex, edge with fine serration; large curved base plate branches off at slightly acute angle.

Remarks. *D. minuta* can be distinguished from most allied species by the small size; it differs from the equally small *caymana* by the lighter wing colour. The ♂ genitalia are closest to those of *lanceella* but uncus and valva have parallel margins, the tegumen has a much deeper anterior emargination, the saccus is longer and narrower and the aedeagus is clearly divided into a bulbous base and a narrow apical portion. The ♂ genitalia of *caymana* differ from those of *minuta* by the broad leaf-shaped uncus and the absence of a curved process at the base of the valva. In the ♀ genitalia *minuta* can be distinguished from all other *Deltophora* species by the long sclerotization of the ductus bursae and the long straight apical portion of the signum.

Biology. Host-plant unknown. Moths have been collected in August and September.

Distribution. Brazil (Amazon).

Material examined.
Holotype ♂, **Brazil**: Amazon, Obidos, ix.1919 (*Parish*) (genitalia slide no. 14 833; BMNH).
Paratype. **Brazil**: 1 ♀, Amazon, Santarem, viii.1919 (*Parish*) (BMNH).

Deltophora suffusella sp. n.

(Figs 59, 111–113)

[*Aristotelia peltosema* (Lower); Meyrick, 1931 : 278. Misidentification.]
[*Aristotelia peltosema* (Lower); Gaede, 1937 : 69 (partim). Misidentification.]

♀. 5·0 mm. Head ochreous to light brown. Labial palpus ochreous to whitish, densely mixed with brown; outer surface of first segment brown; second segment with light ring on apex, outer surface brown, inner surface with scattered brown scales; third segment with dark base and brown ring around middle. Antenna brown, with paler rings above. Thorax brown. Tegula brown with lighter apex. Fore wing grey-brown with blurred dark brown markings: base and distal half of costa dark, small spot at first quarter of costa; large discal spot extended to dorsal margin. Apex not darker than rest of wing.

GENITALIA ♂. Unknown.

GENITALIA ♀ (Figs 111–113). Apophysis posterior 1·5 times length of apophysis anterior. Eighth segment with ventro-lateral pair of large ear-like lobes which originate near base of apophysis anterior and extend to posterior margin of segment. Ostium bursae on anterior margin of eighth sternite, almost as wide as sternite. Posterior part of ductus bursae sclerotized to length of apophysis anterior, composed of three sections. Antrum three-quarters length of apophysis anterior, inner wall with large triangular posterior sclerotization. Colliculum touches antrum. Ductus bursae with sclerotization directly anterior to colliculum. No clear separation of ductus and corpus bursae; ductus evenly dilated from antrum. Anterior portion of corpus bursae with minute spines. Signum strongly curved hook with large base, situated in posterior portion of corpus bursae which is not spined.

REMARKS. *D. suffusella* is distinguished externally from all other South American *Deltophora* species by the indistinct wing markings. The ♀ genitalia are characterized by the ear-like lobes of the eighth segment which distinguish *suffusella* from all other *Deltophora* species.

BIOLOGY. Host-plant unknown. Moths have been collected in October and November.

DISTRIBUTION. Paraguay (Chaco).

MATERIAL EXAMINED.

Holotype ♀, **Paraguay**: Chaco, Makthlawaiya, x.1926 (*Carter*) (genitalia slide no. 14 840; BMNH).
Paratype. **Paraguay**: 1 ♀, Chaco, Makthlawaiya, xi.1926 (*Carter*) (BMNH).

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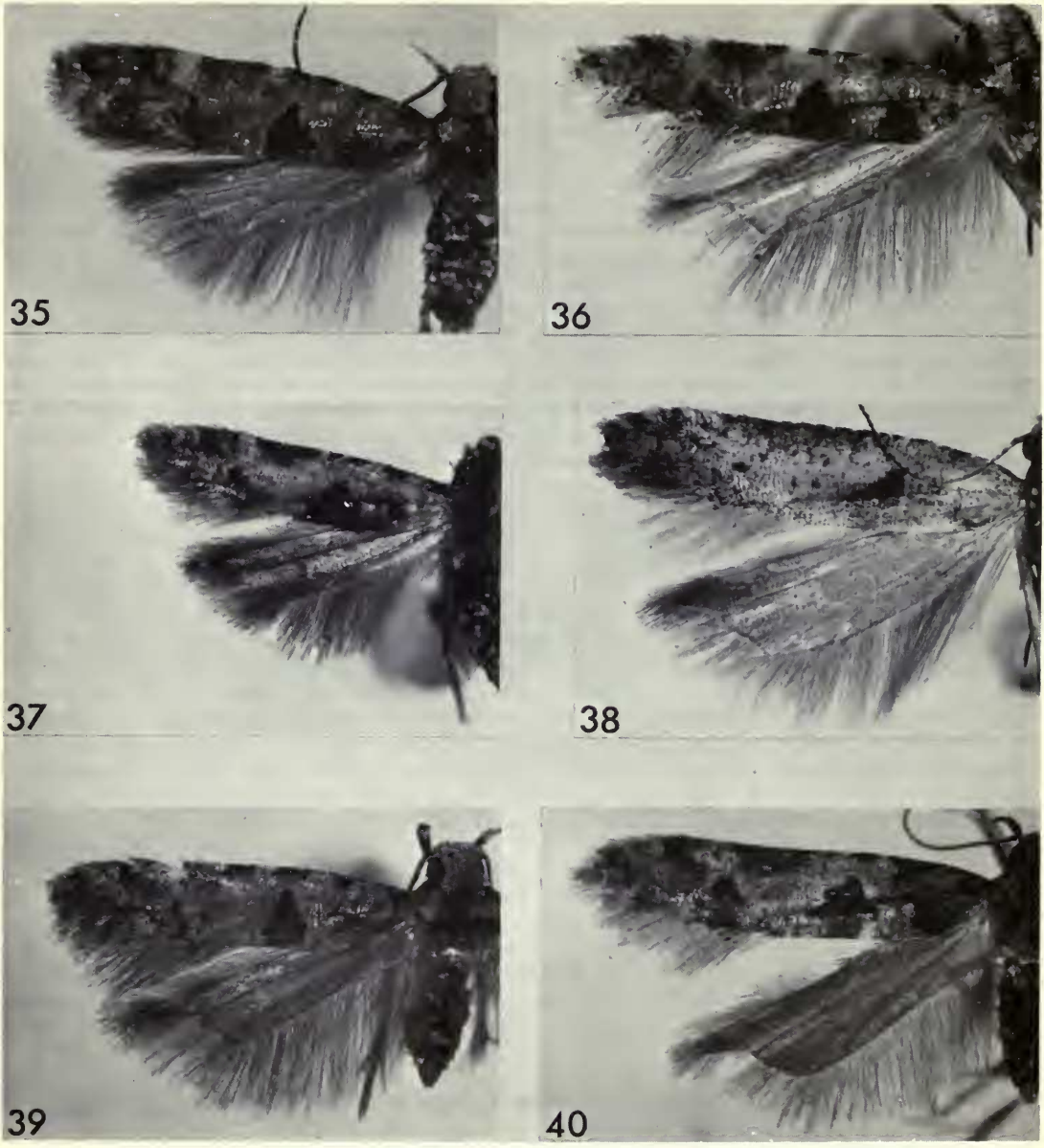
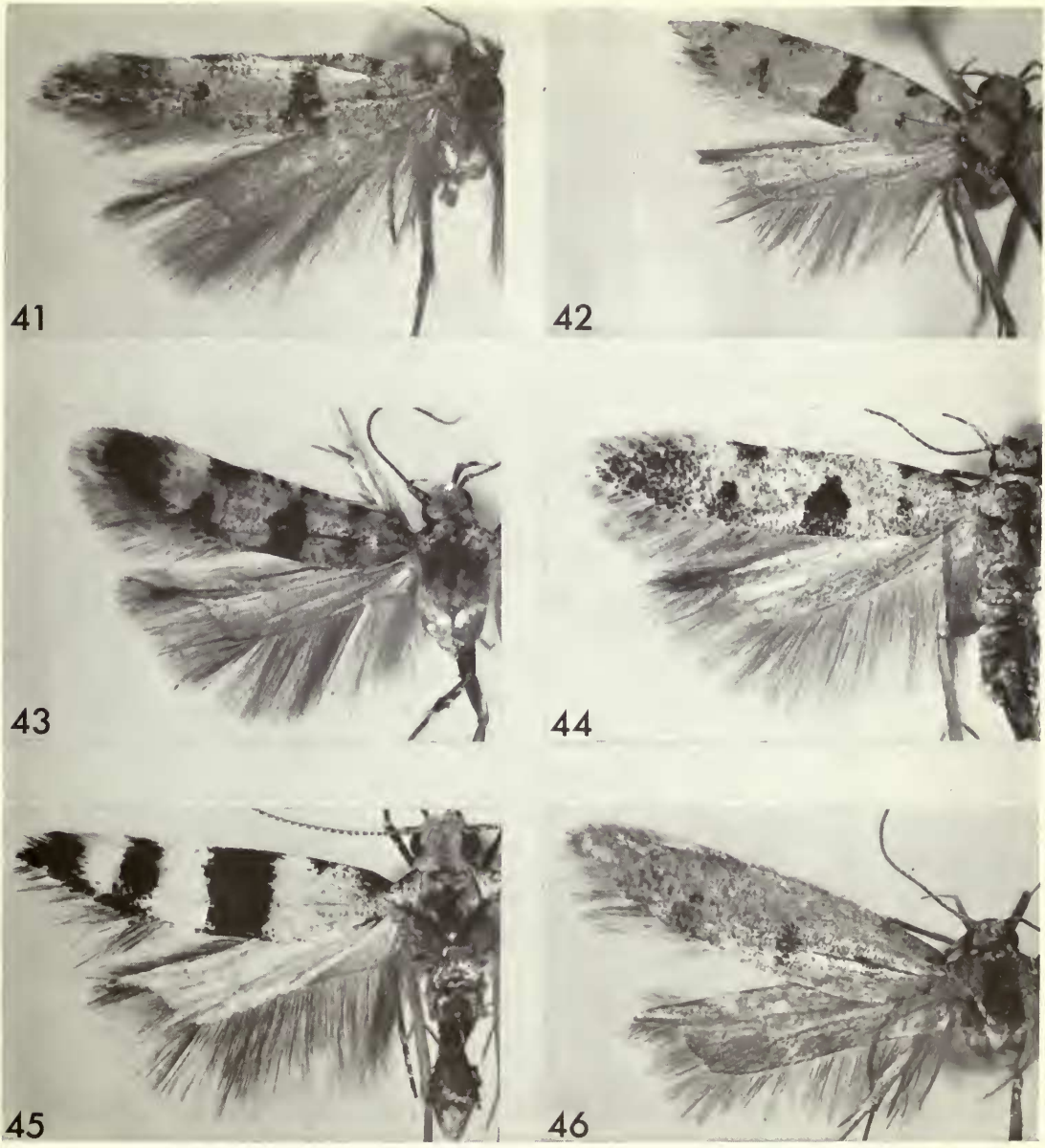


Figs 35–40 Wings of *Deltophora* species. 35, 36, *D. typica* sp. n. (35) ♂, paratype, South Africa (TM, Pretoria). (36) ♀, paratype, Nigeria (BMNH). 37, *D. diversella* sp. n., ♂, paratype, Kenya (BMNH). 38, *D. angulella* sp. n., ♂, holotype, Kenya (BMNH). 39, *D. peltosema* (Lower), ♂, Australia (BMNH). 40, *D. distinctella* sp. n., ♂, holotype, India (BMNH). [Right wing, image reversed.]



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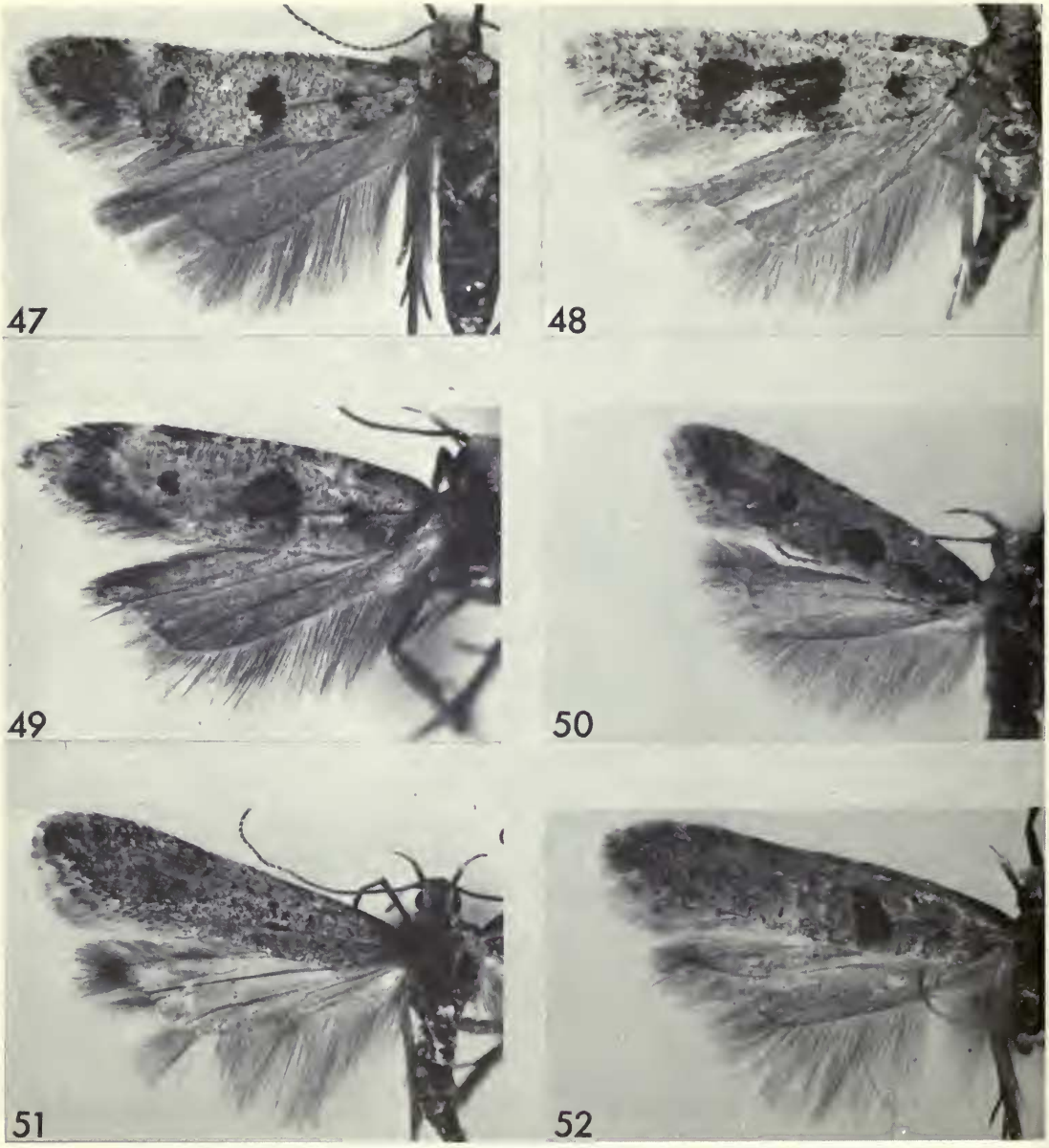

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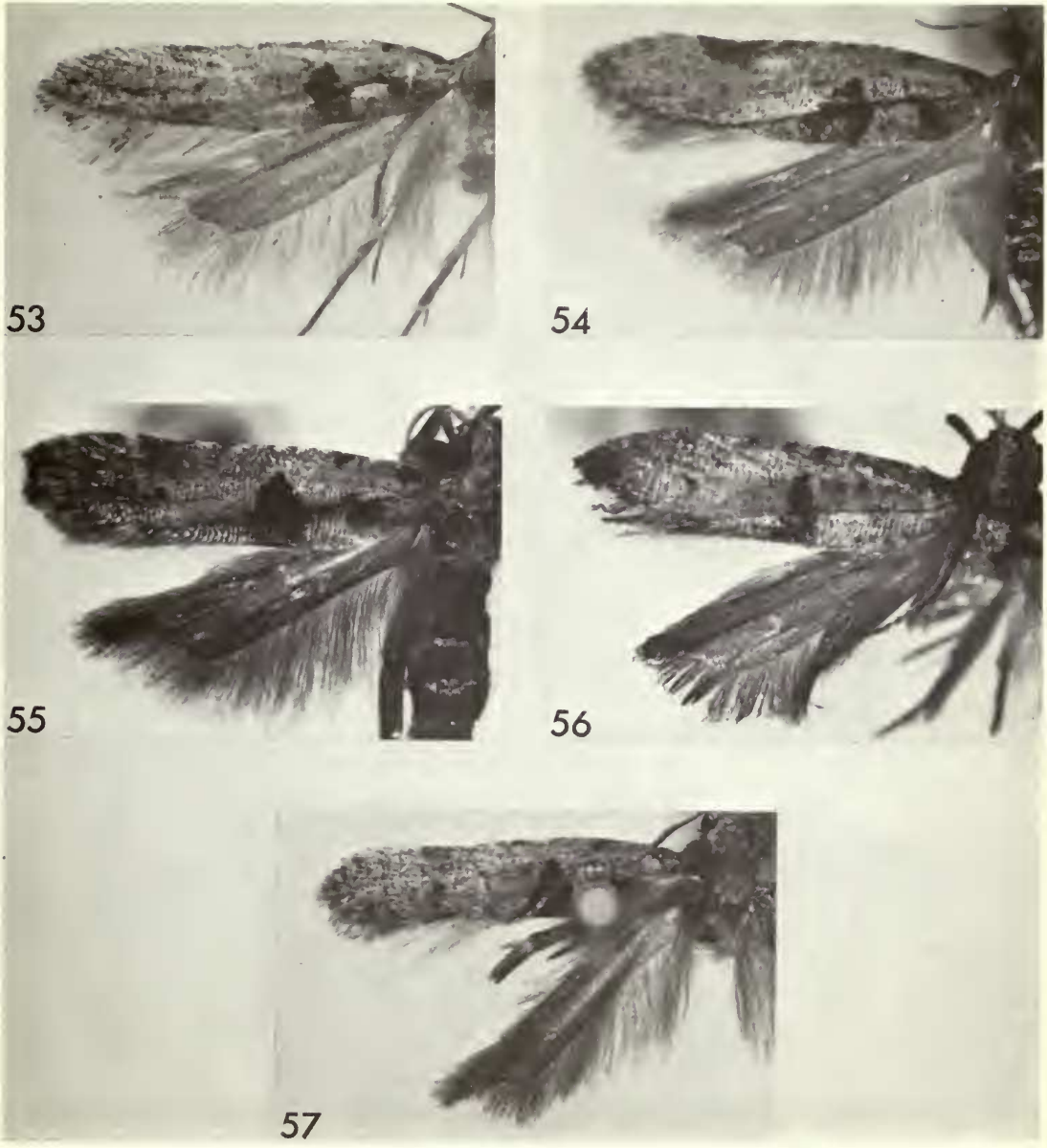

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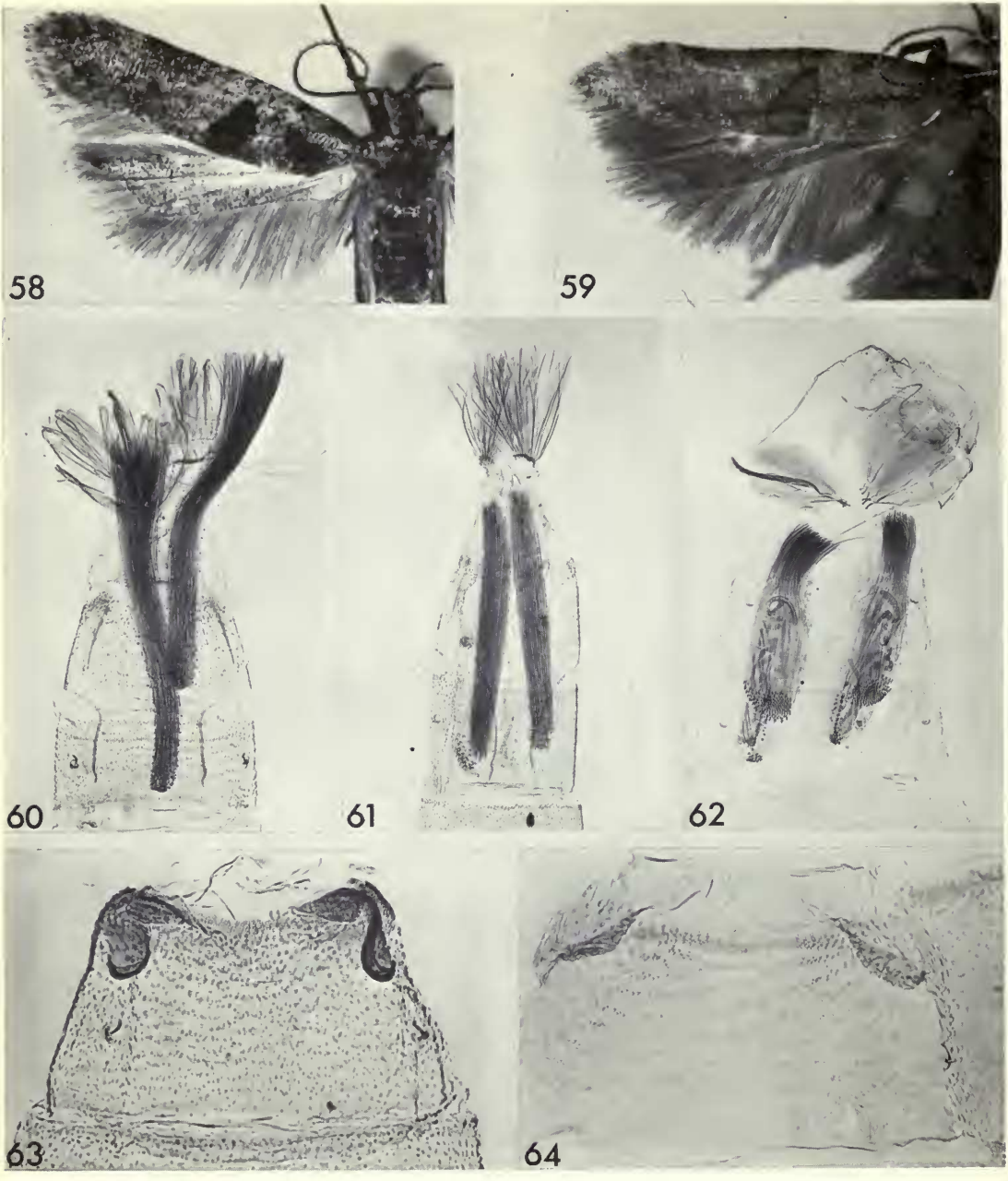

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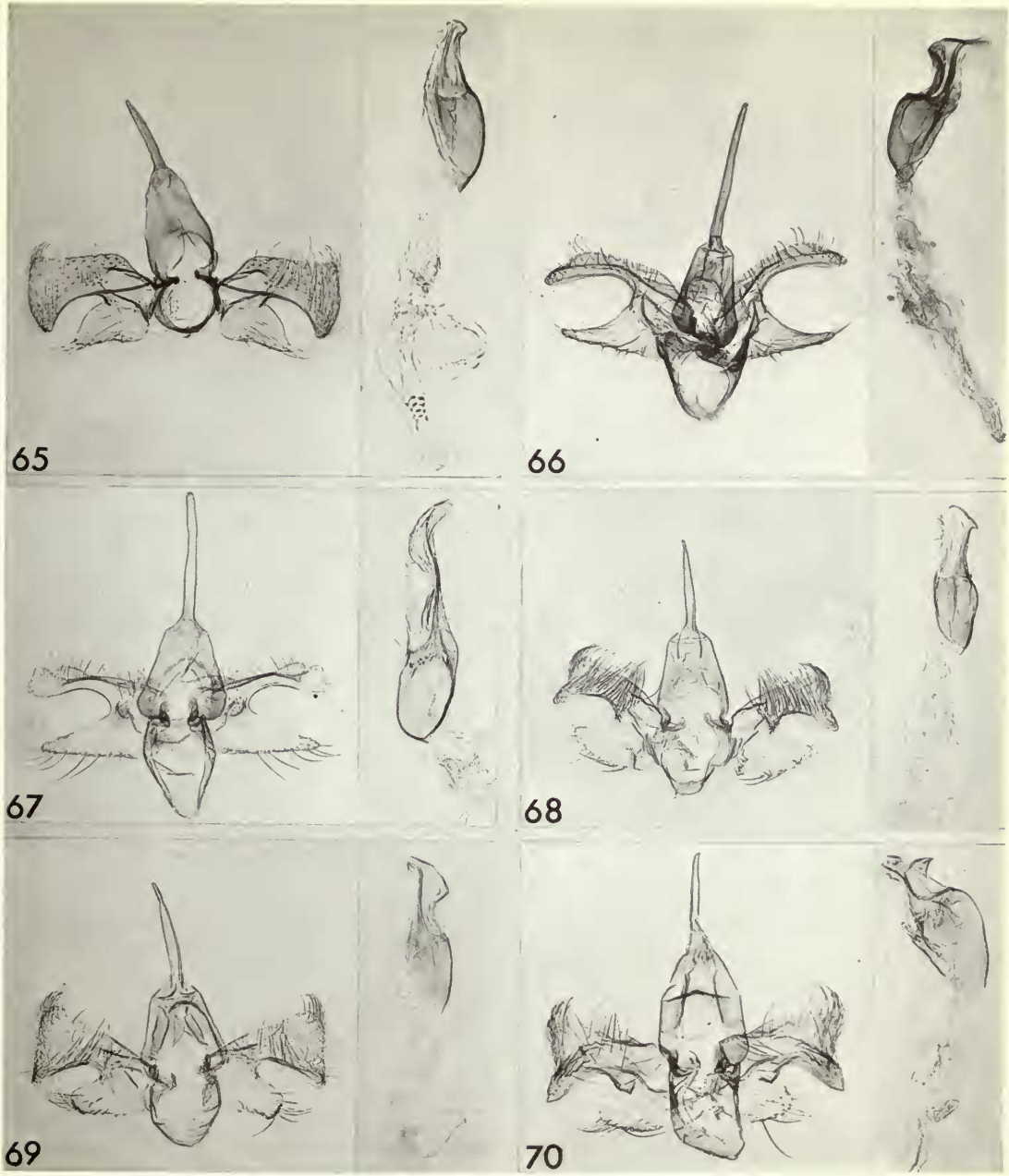

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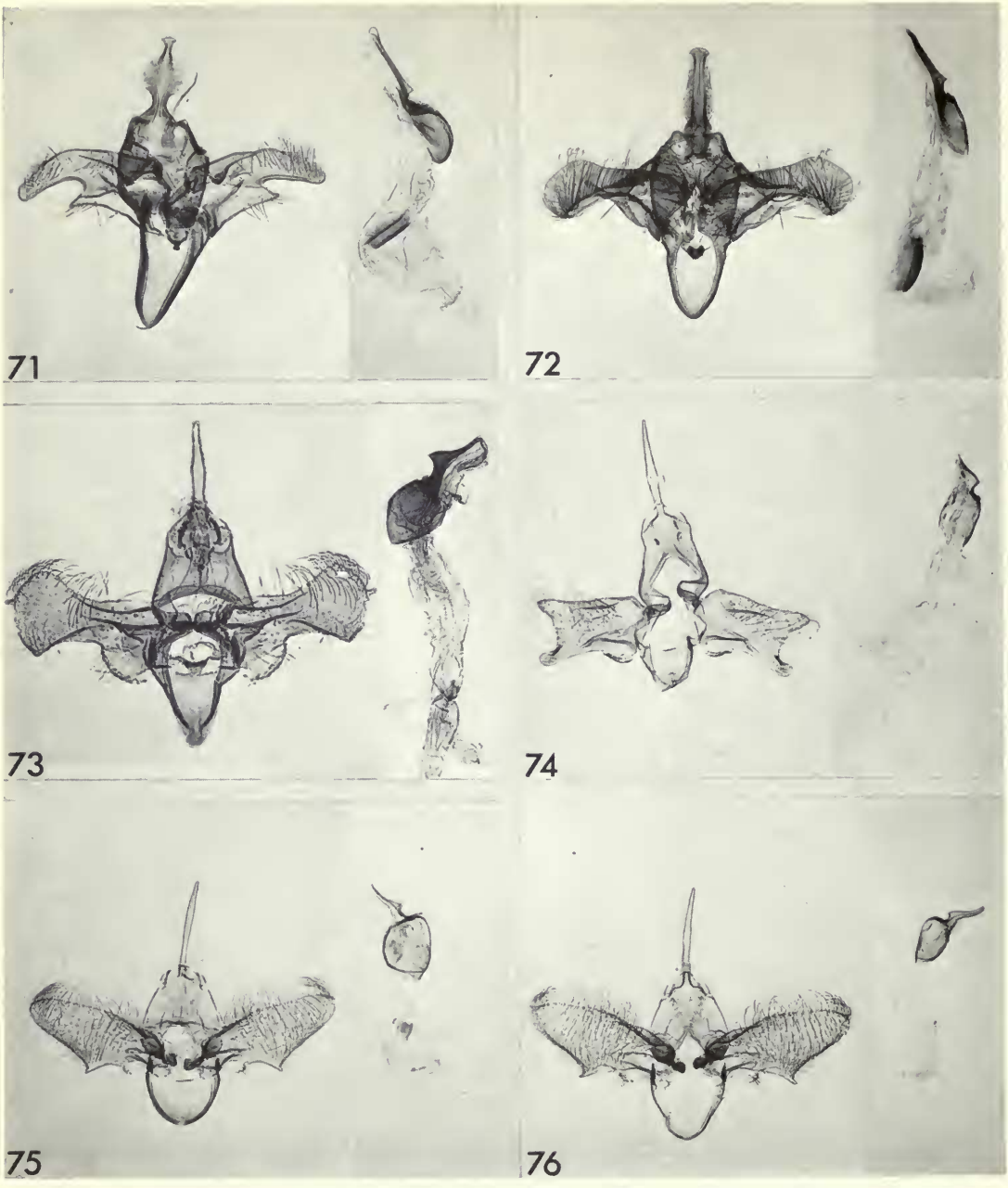

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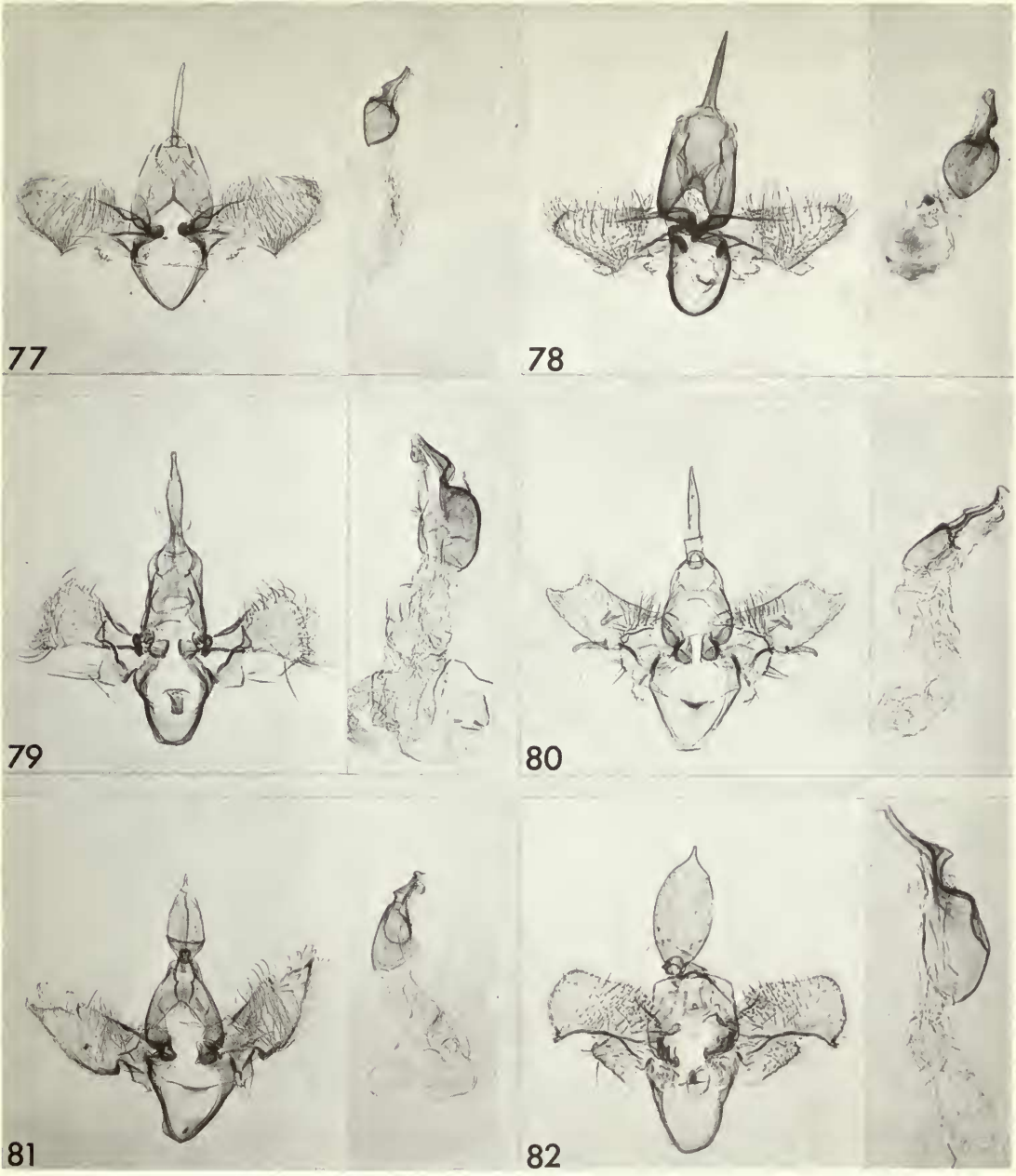

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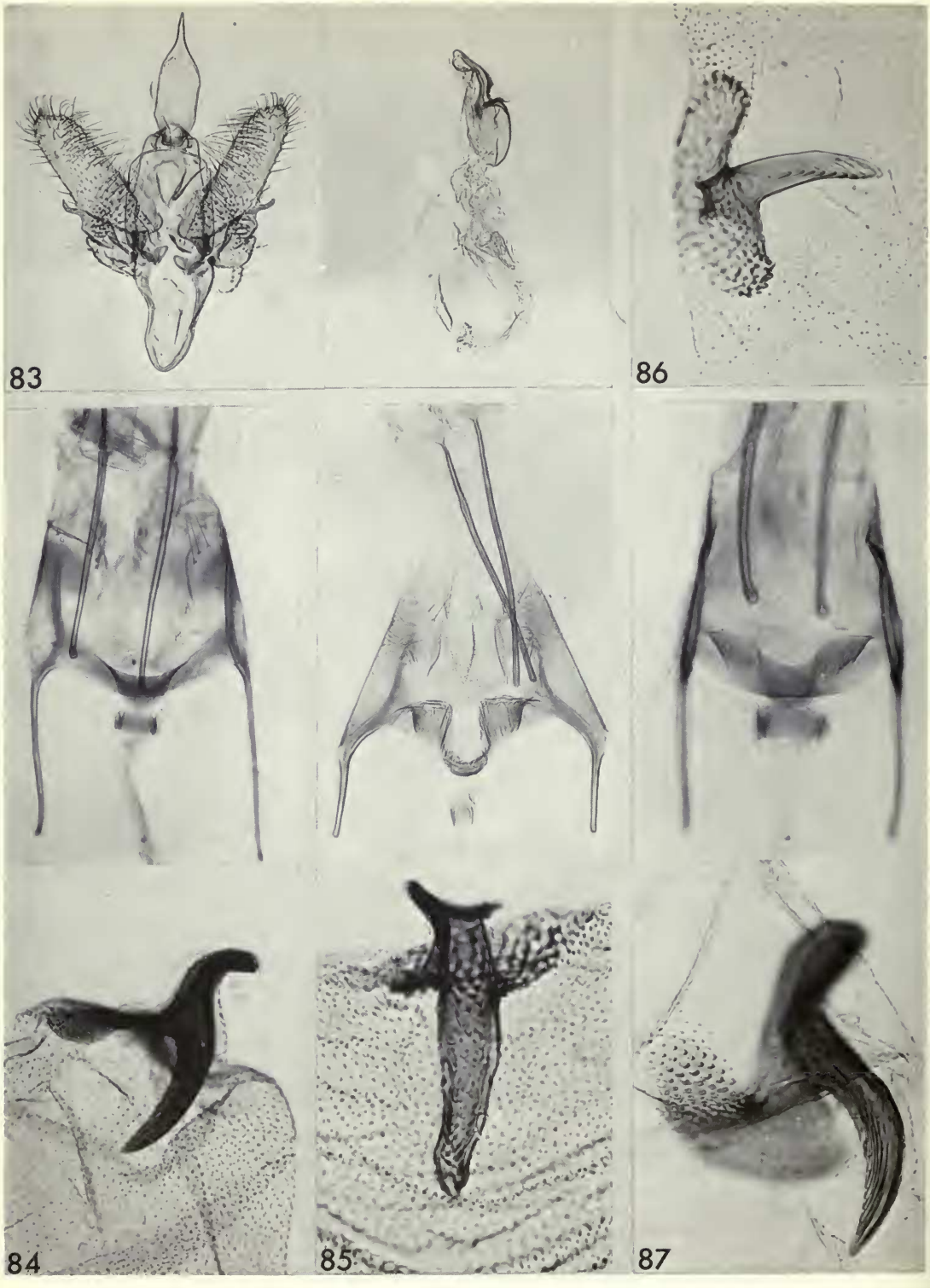

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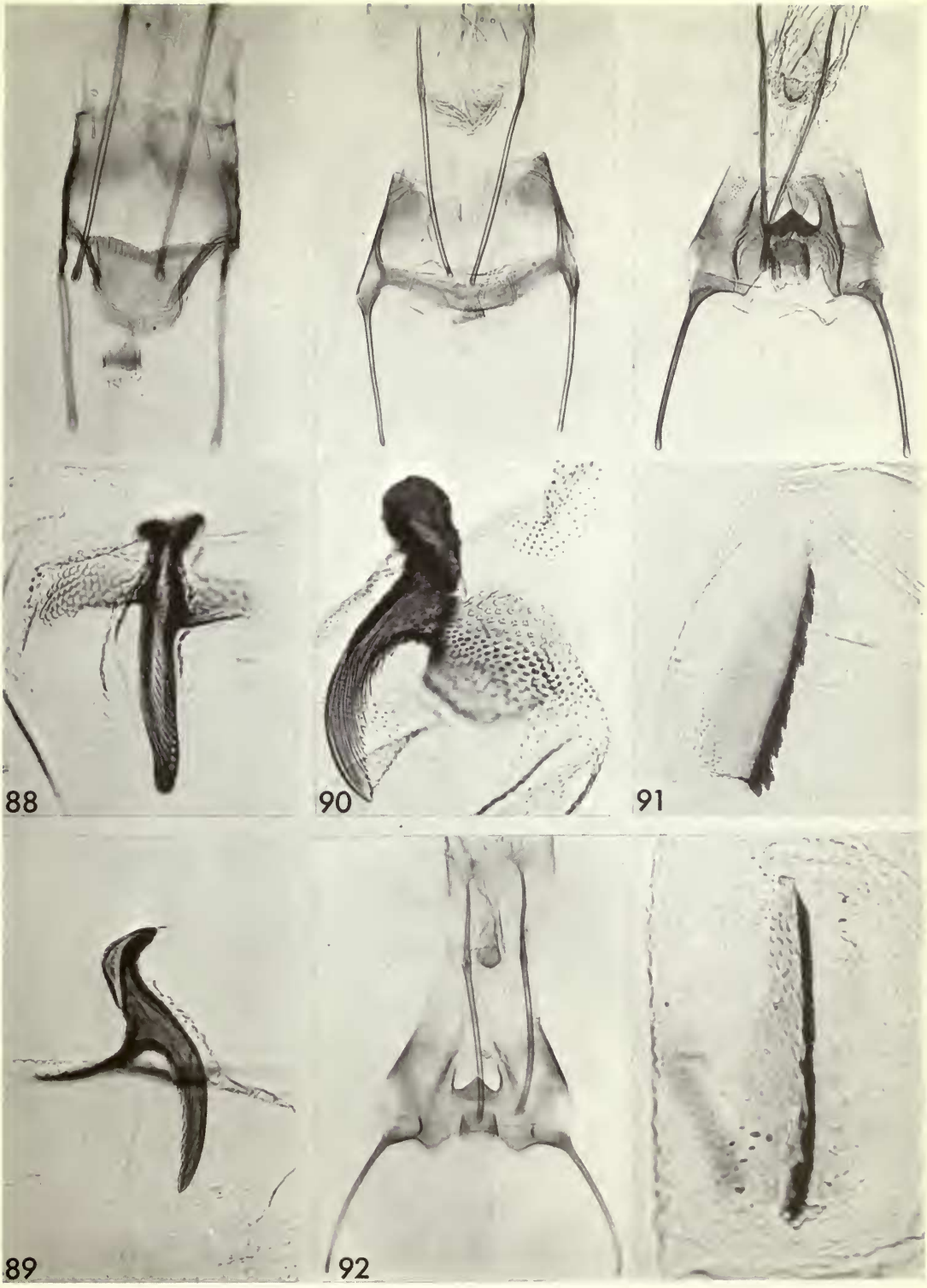

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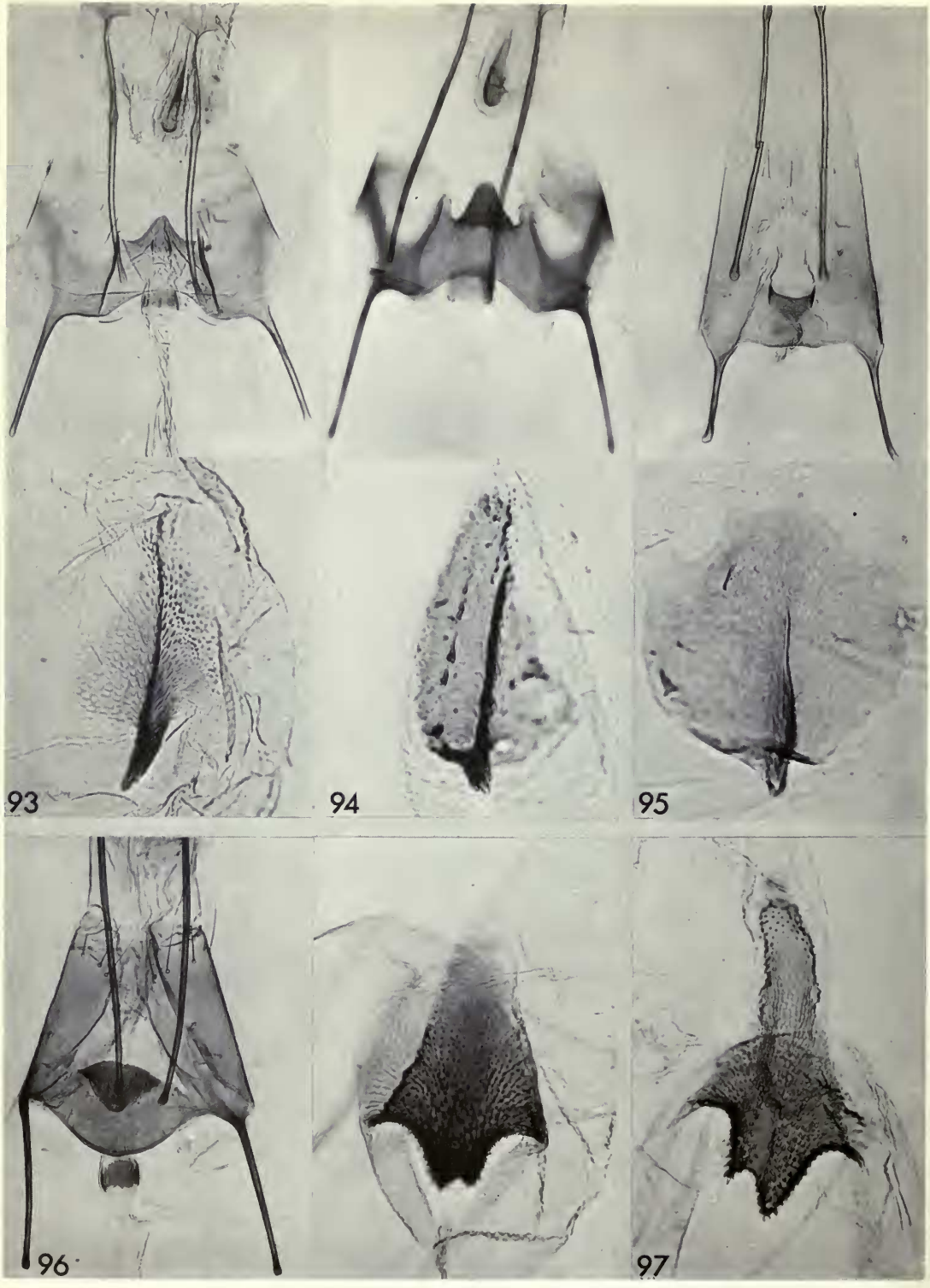

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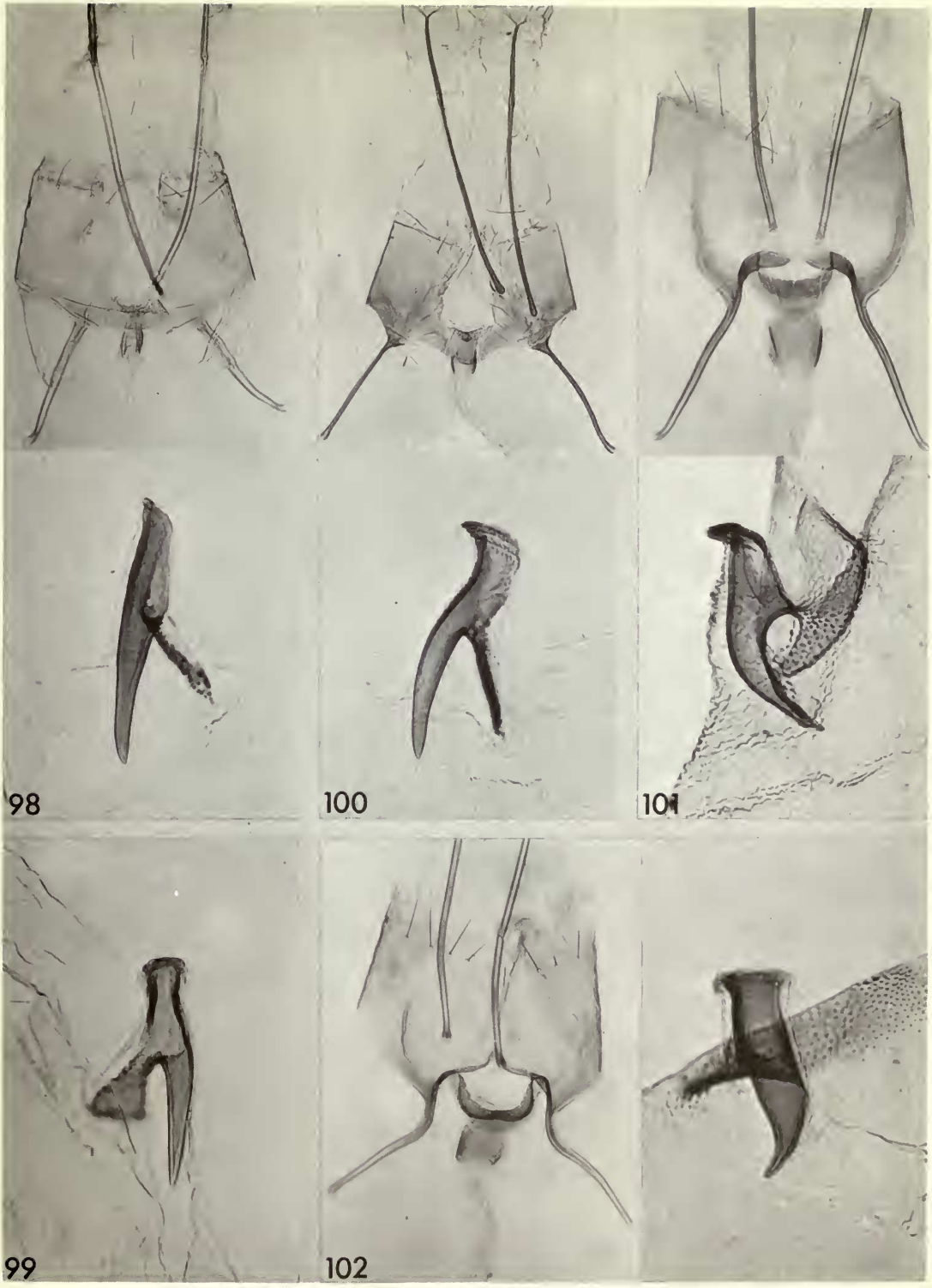

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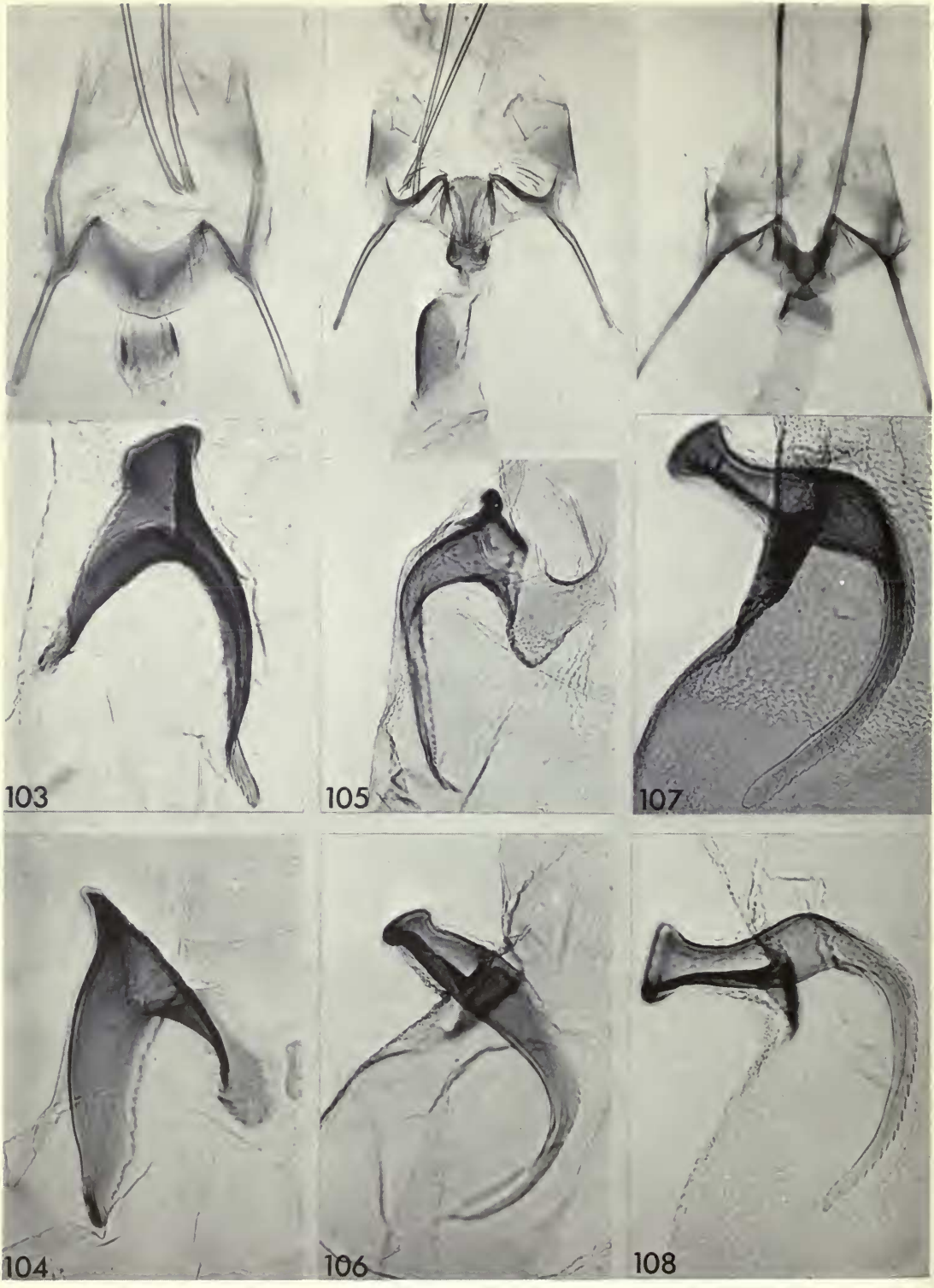

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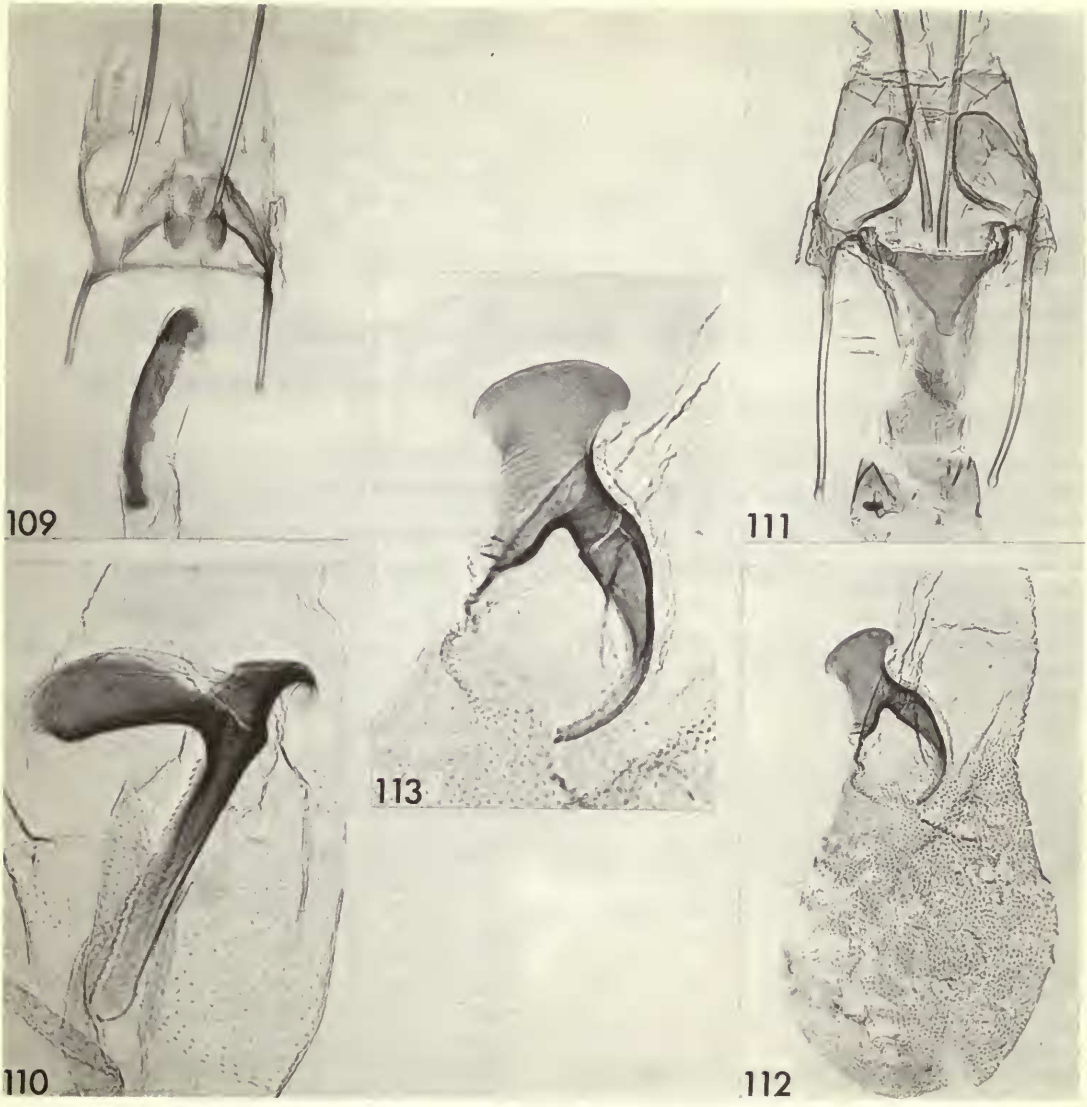

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