A REVISION OF THE ETHIOPIAN SPECIES AND A CHECK LIST OF THE WORLD SPECIES OF *CLEORA* (LEPIDOPTERA: GEOMETRIDAE)

BY

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146 *Text-figs.* ; 14 *Plates* ; 9 *Maps.*

BULLETIN OF
THE BRITISH MUSEUM (NATURAL HISTORY)
ENTOMOLOGY Supplement 8
LONDON : 1967

THE BULLETIN OF THE BRITISH MUSEUM (NATURAL HISTORY), *instituted in* 1949, *is issued in five series corresponding to the Departments of the Museum, and an Historical series.*

Parts will appear at irregular intervals as they become ready. Volumes will contain about three or four hundred pages, and will not necessarily be completed within one calendar year.

In 1965 *a separate supplementary series of longer papers was instituted, numbered serially for each Department.*

This paper is Supplement No. 8 *of the Entomological series. The abbreviated titles of periodicals cited follow those of the World List of Scientific Periodicals.*

World List abbreviation: *Bull. Br. Mus. nat. Hist. Entomology.*

TRUSTEES OF
THE BRITISH MUSEUM (NATURAL HISTORY)

Issued 14*th February,* 1967 *Price* £3 10*s.*

A REVISION OF THE ETHIOPIAN SPECIES AND A CHECK LIST OF THE WORLD SPECIES OF *CLEORA* (LEPIDOPTERA: GEOMETRIDAE)

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CONTENTS

SYNOPSIS

The species of the genus *Cleora* occurring in the Mascarene islands and continental Africa south of the Sahara are described and illustrated. A key to the species based on the male genitalia is included. The 24 species previously known are re-characterized and 22 species and 10 subspecies are described for the first time. A brief history of the genus is given and the affinities of *Cleora* with other Old World genera are discussed. A check list of the world species of *Cleora* is included. Species described originally in the genus, but now known to belong elsewhere, have also been listed ; wherever it has been possible to place these species with precision, the new binomen is given.

MATERIAL EXAMINED

The holotypes or lectotypes of all but three of the Ethiopian species have been studied ; the type of *Cleora acaciaria* (Boisduval) has not been found, but the original illustration is adequate for identification ; *C. quadrimaculata* (Janse) and *C. nigrisparsalis* (Janse) have also been determined from original illustrations.

In addition to the material in the collection of the British Museum (Natural History), which now includes the large and very rich collections of Lord Rothschild, J. J. Joicey, Charles Oberthür and L. B. Prout, material has been loaned by the following :

Muséum national d'Histoire naturelle, Paris ; Monsieur Cl. Herbulot, Paris ; Musée Royal de l'Afrique Centrale, Tervuren, Belgium ; Zoologisches Museum der Humboldt-Universität, Berlin ; Staatliches Museum für Naturkunde, Stuttgart ; National Museum, Nairobi (Coryndon Museum) ; National Museum of Rhodesia, Bulawayo ; Transvaal Museum, Pretoria.

The material has been listed geographically and, unless otherwise stated, specimens are in the British Museum (Natural History).

ACKNOWLEDGEMENTS

I wish to thank the many people who have helped by lending material, who have allowed me to study type specimens, who have answered questions and who have sent genitalia drawings : Dr. C. W. Benson, Dr. L. A. Berger, Mr. R. H. Carcasson, Mr. I. F. B. Common, Dr. A. Diakonoff, Dr. H. J. Hannemann, Monsieur Cl. Herbulot, Dr. H. B. D. Kettlewell, Prof. O. Lindner, Dr. E. C. G. Pinhey and Dr. L. Vari. Mr. Carcasson, with his wide knowledge of the topography and vegetation of continental Africa, has given much valuable help, especially in tracing localities and describing their vegetation.

TREATMENT

Previously known species have been re-characterized in the same style as those species described for the first time. The colour names used in the descriptions are taken from Ridgway (1912, Color Standards and Color Nomenclature).

The wing measurements are those of the smallest and the largest specimens of each sex, the measurement being double that from the apex of the fore wing to the centre of the mesothorax. The genitalia of both sexes, where known, of each species have been described and illustrated. Drawings of the genitalia of a male and a female have been fabricated to illustrate the range of characters referred to in the descriptions (Text-figs. 1–3). The scale placed by each drawing represents one millimetre. The half-tone illustrations have been prepared from photographs supplied by Mr. M. G. Sawyers of the Photographic Section of this Museum.

Bibliographic references appearing in the text and in the synonymy are given in abbreviated form. A full bibliography appears at the end of the paper.

In examining the species previously included in *Cleora*, a number of Old World species have been found to belong to other genera. These are listed separately after the check list of included species to be found at the end of this paper. Wherever it has been possible to place these with precision they have been transferred to appropriate genera and new combinations are indicated, but a number of species will probably need new genera erected to accommodate them.

CLEORA Curtis

Cleora Curtis, 1825 : pl. 88. Type-species : *Geometra cinctaria* Denis & Schiffermüller, 1775, by original designation.

Cerotricha Guenée, 1857 : 284. Type-species : *Cerotricha licornaria* Guenée, by monotypy. **Syn.n.**

Barsine Meyrick, 1883 : 530 *nec* Walker, 1854. Type-species : *Scotosia panagrata* Walker, by subsequent designation ; citation by Meyrick, 1917 : 266. **Syn.n.**

Meyrickia Butler, 1884 : 133, n.n. pro *Barsine* Meyrick, 1883 *nec* Walker, 1854.

Chogada Moore, 1887 : 415. Type-species : *Boarmia alienaria* Walker, 1860, by original designation. [First synonymy by Prout, 1928 : 155.]

Carecomotis Warren, 1896 : 402. Type-species : *Carecomotis perfumaria* Warren, by monotypy. **Syn.n.**

Neocleora Janse, 1932 : 266. Type-species : *Boarmia tulbaghata* Felder, by original designation. **Syn.n.**

Proboscis well developed. Frons and head moderately rough-scaled, with a slight tuft between antennae and another above proboscis, the latter tuft formed by meeting of long scaling from each side. Palpus : first segment long-scaled beneath, scaling equal in length to that of segment ; scaling on second segment one-half as long as that on first ; third segment smooth-scaled, usually depressed. Male antenna bipectinate to about two-thirds of shaft, the longest pectinations about one-eighth as long as shaft, decreasing in length apicad and basad ; the pectinations, arising from the apical margin of each segment, are densely ciliate ventrally and fully scaled dorsally and occasionally tipped with a bristle ; in some species-groups (*cinctaria* Denis & Schiffermüller, *sublunaria* Guenée, *repetita* Butler and *alienaria* Walker) a second, unscaled pair of pectinations, two and one-half times as long as the diameter of the shaft, arises from the basal margin of each segment. In the species *repetita* Butler and *perlepidaria* Warren the second pair of pectinations occurs irregularly. Female antenna shortly bipectinate and ciliate in species groups previously referred to *Carecomotis*, the pectinations shortening in length apicad and basad ; the longest pectinations equal in length to twice the diameter of the shaft, each pair ciliate ventrally and scaled dorsally and arising from the apical margin of each segment ; in remainder of genus, antenna minutely ciliate with a pair of bristles to each segment. Metathorax with a slight crest ; pectus with long hair-scales. In male, first abdominal tergite crested ; third abdominal sternite with a cluster of spines on anterior margin in species in which a hair-pencil is present on the hind tibia. Fore tibia with process extending to tarsal joint ; male hind tibia usually dilate with a hair pencil and two pairs of spurs. Fore wing : termen oblique and very slightly crenulate ; a weak fovea in male ; veins R_1 and R_2 free from radius, rarely from a point or shortly stalked (*munditibia* Prout, *dodonaeae* Prout) ; R_{3-5} on long stalk ; M_2 a little closer to M_1 than to M_3 ; Cu_1 from just before lower angle. Hind wing : termen slightly crenulate ; $Sc + R_1$ approximated to basal half of upper margin of cell ; R_5 from before upper angle. Discal spots on both wings consist of raised scales ringed with fuscous or black. Wing pattern in genus characteristic, varying mainly in degree of emphasis of certain fasciae and suffusion of colour. Fore wing : antemedial fascia from one-third costa, shallowly lunulate, bowed distally in discal area, then inclined to one-fourth inner margin ; medial fascia lunulate from discal spot to one-half inner margin ; postmedial fascia shallowly lunulate from two-thirds costa, bowed distally in discal area, then inclined to five-eighths inner margin ; area distad of postmedial fascia traversed by several ill-defined, lunulate fasciae ; some irroration proximad of antemedial fascia, but medial area often little marked ; a fuscous streak between veins M_1 and M_2 distad of discal spot. Hind wing : lunulate medial fascia from discal spot to one-half anal margin ; postmedial fascia lunulate and parallel to termen from two-thirds costa to two-thirds anal margin ; area distad of postmedial fascia similar to that of fore wing. Terminal interneural spots fuscous on both wings.

Male genitalia. Uncus usually simple and tapered, tip minutely produced (apex spatulate in some subspecies of *onycha* Fletcher and in *sabulata* Fletcher and evenly rounded in *albobrunneata* Fletcher) ; gnathus well developed, usually forming a spiculate plate medially ; dorsal margin valve sclerotized, apex dilate into a membranous pad usually clothed with hair-scales or weak spines, rarely spiculate (*sabulata*, *albobrunneata*) ; ventral margin usually sclerotized and bearing one or more processes ; a tuft of long hair-scales arises from base of valve near base of juxta ; aedeagus variable in shape, but usually tapered apicad ; vesica usually with one or more cornuti.

Female genitalia. Ovipositor long and retractile, greater in length than the distance from the ostium to the anterior tip of the bursa copulatrix. Sterigma sclerotized, specifically diagnostic in form. Bursa copulatrix sometimes wholly membranous, sometimes sclerotized and ribbed anteriorly ; stellate or disc-like signum present in all species with two pairs of pectinations on each segment of male antenna, absent from all African species, present or absent in remaining species.

Taxonomic history.

The genus *Cleora* is richly represented in the tropical regions of the Old World and its range extends into the temperate region of both the Old and New Worlds, being represented in North America by the two species *C. sublunaria* (Guenée) and *C. projectaria* (Walker).

Hitherto, on the grounds of convenience, *Cleora* has been treated taxonomically in a variety of ways. Interpreted strictly, the genus has included only those species in which the male antenna bears two pairs of pectinations on each pectinate segment, one pair very long and densely ciliate, the other shorter and simple, and in which the female antenna is simple.

Carecomotis, occurring in the tropical parts of the Oriental region and in the Australian and Pacific regions, included 29 known species and was separated from *Cleora* on the basis of the antennae; the pectinate segments of the male antenna each bearing one pair of long, densely ciliate pectinations arising from the anterior edge of the segment, the female antenna bearing one pair of similar, but shorter pectinations. In both *Cleora* and *Carecomotis* the male genitalia conform to a similar basic pattern, a well developed but simple and tapered uncus, a well developed gnathus with a scobinate medial plate, a weak juxta, the valve with a well defined but weakly sclerotized dorsal area, a lobe-shaped cucullus without processes and a well developed and sclerotized sacculus displaying specifically diagnostic characters; the aedeagus is usually at least twice as long as broad, usually with one or more cornuti adorning the vesica. The female genitalia bear a well developed and specifically diagnostic sterigma and usually a clearly defined colliculum ; the posterior part of the bursa copulatrix is usually ribbed and sclerotized and the remainder is membranous, with or without a signum ; when present the signum is disc-like or stellate.

The Ethiopian representatives of *Cleora* were separated by Janse (1932 : 266) on the basis of the antennae, which in the male bear only one pair of long, densely ciliate pectinations on each pectinate segment and in the female are simple, and were placed in the genus *Neocleora* which he erected for them. Subsequent examination of the female genitalia of these Ethiopian species has shewn them to lack a signum on the bursa copulatrix. The neuration, male genitalia and habitus of both sexes are, however, closely similar in general pattern to those species that were included separately in *Cleora* and *Carecomotis*.

Whilst the groups of species that were included separately in *Cleora*, *Carecomotis* and *Neocleora* each display certain well defined characters in one sex only and each group has evidently speciated extensively, the more satisfactory treatment groups all these species in one genus under the oldest available name, *Cleora*.

The North American species of *Cleora* were re-described and illustrated by

McDunnough in 1920. The greater part of the Indo-Australian species of *Cleora* were treated by Prout in two revisions, 1929a and 1937. The species previously included in *Carecomotis* were revised by Fletcher in 1953. The Ethiopian species of *Cleora* then known were treated by Janse in 1932 under the name *Neocleora*.

Affinities. *Cleora* is closely related to *Ascotis* Hübner (1825 : 313), which is represented in southern Europe by *A. selenaria selenaria* (Denis & Schiffermüller), by *selenaria reciprocaria* (Walker) in continental Africa and by further subspecies in India, Ceylon, China and Japan. The neuration is almost identical to that of *Cleora*, but R_2 sometimes anastomoses briefly with R_3. In *Ascotis* the male antenna is ciliate and in the male genitalia the uncus is short and shallowly bifurcate ; in the female genitalia the sterigma is weakly developed and the presence of a signum separates it from the Ethiopian species of *Cleora* ; the characteristic shape of the signum (with the anterior edge toothed, often strongly) at each corner, separates it from the remaining species of *Cleora*.

Also closely related to *Cleora* is the genus *Alcis* Curtis (1826 : 113) occurring in the Palaearctic and Indo-Australian regions. Though the neuration is identical with that of *Cleora*, there are a number of other structural differences which clearly separate it. In the males of species examined (except *A. gomphica* Wehrli and *A. flavolinearia* Leech) the pectinations of the male arise from the apical edge of each pectinate segment and are unscaled. In the male genitalia the juxta is two-pronged, the valve has the ventral margin membranous and unadorned, but with a process at mid-valve arising from mid-dorsal margin, and a characteristically halberd-shaped cornutus on the vesica. In those examples of the female genitalia of *Alcis* so far examined, there are two weakly spiculate signa on the bursa copulatrix.

Hypopalpis Guenée (1862 : 29) was erected for *H. terebraria* Guenée and *H. perforaria* Guenée, since shown by Vinson (1938 : 38) to be synonymous ; *terebraria* was placed by Vinson in *Cleora*. *Hypopalpis terebraria* and *H. antemelaria* Mabille (1893), island endemics on Réunion and Mauritius respectively, have male antennae of the *cinctaria* type, with two pairs of scaled pectinations from each pectinate segment, but in the structure of the genitalia of both sexes these species are closely related to *Ascotis selenaria* and they have been transferred to the genus *Ascotis*. *Hypopalpis terebraria* Guenée is here selected for the first time as type-species of *Hypopalpis*, which becomes a junior synonym of *Ascotis*. **Syn. n.**

Prout (1938 : 154) erected the genus *Colocleora* for 32 species from the Ethiopian region, which probably belong to two or more genera. The species agreeing in structure with the type-species of *Colocleora*, *Alcis ansorgei* Warren, show some similarity in habitus to that of *Cleora*, but structurally are closely related to *Ascotis*. In the male the neuration is identical with that of *Cleora*, but the pectinations of the antennae arise from the base of each segment and are unscaled ; in the females of those species of *Colocleora* available for study, veins R_1 and R_2 in the fore wing are long-stalked. In the male genitalia the uncus is usually very short, squat and triangular and the form of the valve in the male and that of the signum in the female of those species available for study are similar to those of *Ascotis*.

The genus *Scotorythra* Butler (1883 : 177), in which Zimmerman (1958 : 1–2) has

listed 37 species, is endemic in the Hawaiian Islands. Structurally the species are related to *Cleora*, possibly deriving from an ancestor of *C. nausori* B.-Baker from Fiji or of *C. cheesmanae* Prout from the New Hebrides ; they differ markedly, however, in habitus, in the narrow and proportionately longer wings and in the unpatterned hind wings.

In the Indo-Australian region the genera *Paradromulia, Catoria, Ophthalmodes, Pseudalcis* and *Cusiala* occur with and approach closely in habitus many species of *Cleora*, but are structurally distinct.

Paradromulia Warren (1896 : 300) has veins R_1 and R_2 of the fore wing long-stalked in both sexes, R_2 anastomosing briefly with R_3. The genitalia differ in both sexes ; in the male, the uncus is bifurcate and in the female the ovipositor is appreciably shorter than that found in *Cleora*.

Catoria Moore (1887 : 414) has veins R_1 and R_2 of the fore wing long-stalked, the stalk anastomosing briefly with *Sc*. The male antenna has two pairs of pectinations to each pectinate segment, as in part of *Cleora*, but the pectinations are equal in length and unscaled ; each pair of pectinations is in part fused basally. The genitalia of both sexes differ in structural pattern from those of *Cleora* ; in the male the valve is produced and the uncus is very short and broad with two dorsal digitate processes recalling those found in *Semiothisa* Hübner ; in the female genitalia the ovipositor is appreciably shorter than that found in *Cleora*. The genus *Catoria* was revised by Prout, 1929c.

Ophthalmodes Guenée (1857 : 283) has neuration similar to that of *Catoria* ; in both sexes the antennae are bipectinate, the pectination in the male being longer than those in the female ; the pectinations in both sexes are unscaled. In the male genitalia the uncus is reduced and bears lateral processes and the eighth sternum is specialized. In the female genitalia the ovipositor is short.

In *Pseudalcis* Warren (1897 : 96) veins R_1 and R_2 in the fore wing are long-stalked, R_1 anastomoses briefly with *Sc* and R_2 with R_3 to form a long, slender areole. The male antennae are bipectinate for the greater part of their length ; the long pectinations are unscaled and arise from the base of the segment. The genitalia of both sexes differ appreciably from the pattern of *Cleora*.

In *Cusiala* Moore (1887 : 407) veins R_1 and R_2 of the fore wing are long-stalked, the male antennae are lamellate and ciliate and the genitalia of both sexes differ in pattern from those of *Cleora*.

Distribution.

The species of *Cleora* in the Ethiopian region, to judge from the limited information on data labels, appear to be forest insects ; of the 38 species known from continental Africa, 25 are recorded from the equatorial forest of West Africa, Congo and Western Uganda ; 12 other species are from areas of montane, lowland, riverine and temperate forests ; *C. oligodranes* differs in having apparently adapted to the drier conditions of open, grassy plains.

Eight species appear to be island endemics, five in the Indian Ocean, *acaciaria* on Réunion, *legrasi* and *macracantha* on Madagascar, *transversaria* and *angustivalvis*

on the Comoro Is., and three species in the Gulf of Guinea, *tamsi* on Principe I., and *viettei* and *prosema* on São Thomé I. *Subcincta subcincta* is an endemic subspecies on São Thomé I. and the most widely distributed species, *rothkirchi*, is represented by an endemic subspecies on the island of Socotra and by another on Madagascar.

The other species occurring on Madagascar, *quadrimaculata*, is distributed also on the coasts of East Cape Province and Natal ; this limited distribution, without any apparent subspeciation, suggests that its arrival in continental Africa is of recent origin.

Biology.

Little is known of the biology of the Ethiopian species of *Cleora* ; *herbuloti* is known to have defoliated introduced timber trees, *Pinus patula* and species of *Eucalyptus*, showing an adaptability comparable with the African forest dwelling species of *Buzura*, *B. abruptaria* Walker and *B. edwardsi* Prout, which extensively damaged introduced softwoods in Western Uganda in 1961 (W. K. Brown, 1962, Uganda Forest Department, Technical Note No. **99** (62) ; 1–8, figs.).

Species-Groups.

Among the Ethiopian species of *Cleora* a number of species-groups are recognizable, but there remain nevertheless several species which appear to be structurally remote and which it has not been possible to place with any certainty.

The *acaciaria* group, which includes *acaciaria*, *transversaria*, *betularia* and *flavivenata*, possesses in common in the male genitalia a smoothly tapered process on the sacculus, partially enclosed in a membranous fold from the ventral margin of the valve. In the female genitalia there is a simple lamella postvaginalis and a well-developed colliculum, tapered anteriorly ; *papillifer* and *cancer* are included on the basis of the male genitalia ; *melanochorda* is included on the basis of habitus and on the form of the process on the sacculus, but differs in not having the membranous fold on the valve developed. The distribution of the *acaciaria* group is shown on Map 1.

Allied to the preceding is the *oculata* group, which includes *oculata*, *anacantha*, *prosema* and *epiclithra*. In the male genitalia the process on the sacculus extends parallel with the ventral margin of the valve and is partially enclosed in a membranous fold ; the apex of the process is incurved and bears a dense cluster of spines. The female of *epiclithra* is unknown, but the genitalia of the other three species are diverse in form. *Carcassoni* is tentatively associated with the *oculata* group ; the ventral fold is present and the aedeagus is similar to that of *anacantha*. The distribution of the group is shown on Map 2.

Species of the *raphis* group, which includes *raphis*, *aculeata* and *panarista*, are recognizable in the male by the presence of a coarsely scobinate area just basad of the cucullus and a stout tapered process on the sacculus ; in the female the series of concentric, medial ridges on the lamella postvaginalis and the form of the ostium bursae are distinctive. *Echinodes* and *boetschi* are placed in the *raphis* group on the basis of the male genitalia. *Quadrimaculata* and *lacrymata* are associated

tentatively with the *raphis* group, principally on the female genitalia ; though the males of these two species lack areas of coarse scobination on the valves, *quadrimaculata* possesses a well developed process on the valve comparable with that of *echinodes* and *lacrymata* has a well sclerotized apex to the aedeagus and the form of the cornuti and the presence of a well-defined, sclerotized band on the vesica are closely similar to those found in *raphis*. The distribution of the group is shown on Map 3.

The *tulbaghata* group is characterized in the male by the form of the larger of two cornuti which is either of even width or dilate apically ; the apex is serrate, the serration extending basad along one side. In the female genitalia the posterior half of the bursa copulatrix is heavily sclerotized and ribbed, with a shoulder-like projection at the left side posteriorly. In addition to *tulbaghata*, the group includes *dargei*, *dactylata*, *thyris*, *nigrisparsalis*, *plax* and *munda*. The distribution of the *tulbaghata* group is shown on Map 4.

The *rostella* group is characterized in the male by the presence on the vesica of two strongly developed, tapered cornuti which are fused basally, by the weakly developed apical process on the sacculus and by the presence near the base of the sacculus of one or more short, setose, digitate processes. The female genitalia are diverse in form ; there is usually a well-defined lamella postvaginalis with a sclerotized lobe medio-dorsally, often mitre-shaped ; the posterior part of the bursa copulatrix is usually well sclerotized and sharply contrasted with the membranous, often globular, anterior part ; the female genitalia of *oligodranes* and *rothkirchi* are weakly sclerotized ; those of *macracantha* are asymmetrical and aberrant. In addition to *rostella*, the species group includes *legrasi*, *angustivalvis*, *serena*, *oligodranes*, *macracantha*, *derogaria*, *pavlitzkiae*, *lima*, *scobina*, *radula* and *rothkirchi*.

The species *toulgoetae* and *lamottei* are tentatively placed in the *rostella* group on the form of the cornuti on the vesica.

The distribution of the *rostella* group is shown on Maps 5–8.

The species *tamsi* and *viettei*, endemics on the islands of Principe and São Thomé respectively, though closely related to each other, have been tentatively placed in the genus ; *herbuloti* and *acerata*, another closely related pair, have also been placed only tentatively ; *subcincta* and *bicornis* appear to be isolated species and each has been placed in *Cleora* arbitrarily. Biological data, when available, may help clarify the affinities of these species. Their distribution is shown on Map 9.

Key to Species based on Male Genitalia

1		Valve with area of dense, coarse scobination ventrally just basad of cucullus, but not extending to dorsal margin 2
–		Valve not so developed 6
2	(1)	Scobinate area in form of a slender, arcuate band from below cucullus reaching ventral margin at one-third ; arm of sacculus curved, spatulate, of even width and scobinate at apex, extending in length to mid-cucullus ; short, setose digitate process medially at one-third valve (Text-fig. 69) . ***boetschi*** (p. 54)
–		Scobinate area and sacculus not so formed 3

3 (2) Scobinate area extending to cucullus ; process from sacculus almost rhomboid, posterior dorsal angle produced in short, digitate form (Text-fig. 54) ***echinodes*** (p. 46)

– Scobinate area separated from cucullus ; process from sacculus aculeate (Text-figs. 57, 61, 64) 4

4 (3) Vesica with three cornuti, but without scobinate band (Text-fig. 65) ***panarista*** (p. 51)

– Vesica with two cornuti and scobinate band (Text-figs. 58, 60) 5

5 (4) Two smooth, tapered cornuti equal in length ; scobinate band equal in length to width of aedeagus ; aculeate arm of sacculus two-thirds as long as dorsal margin of valve (Text-figs. 57, 58) . . . . ***raphis*** (p. 48)

– Two cornuti of unequal length, the longer tipped with four spines ; scobinate band equal in length to shorter cornutus ; aculeate arm of sacculus one-half as long as dorsal margin of valve (Text-figs. 60, 61) . . ***aculeata*** (p. 49)

6 (1) Vesica with single cornutus, shallowly bifurcate at apex ; aculeate arm of sacculus parallel with and extending to cucullus (Text-figs. 16, 17) ***melanchorda*** (p. 24)

– Vesica and sacculus not so formed 7

7 (6) Arm of sacculus three-fourths as long as dorsal margin of valve, apex incurved and densely spined but not covered by a membraneous fold from ventral margin of valve ; aedeagus smooth ; no cornutus (Text-figs. 37, 38) ***anacantha*** (p. 34)

– Sacculus and aedeagus not so formed 8

8 (7) Arm of sacculus partially or entirely covered by a setose, membranous fold from ventral margin of valve ; aedeagus with one or more cornuti . . 9

– Sacculus not so formed 17

9 (8) Arm of sacculus parallel with ventral margin of valve, apex incurved and bearing a cluster of spines 10

– Sacculus not so formed 12

10 (9) Aedeagus smooth ; vesica with one tapered cornutus sub-equal in length to mid-width of aedeagus ; arm of sacculus three-fifths as long as dorsal margin of valve (Text-figs. 39, 40) . . . . . ***epiclithra*** (p. 36)

– Apical third of aedeagus scobinate along left half of dorsal surface ; vesica with two or more cornuti 11

11 (10) Arm of sacculus three-fifths as long as dorsal margin of valve, with a short, semicircular process at base ; vesica with three weakly sclerotized cornuti (Text-figs. 34, 35) . . . . . ***prosema*** (p. 34)

– Arm of sacculus nine-tenths as long as dorsal margin of valve, without basal process ; vesica with two cornuti, broad based and strongly sclerotized (Text-figs. 31, 32) . . . . . ***oculata*** (p. 31)

12 (9) Arm of sacculus with bifurcate, claw-like apex ; aedeagus broadened apicad ; vesica with two tapered cornuti and a longitudinal scobinate band (Text-figs. 22, 23) . . . . . ***cancer*** (p. 28)

– Arm of sacculus with simple, tapered apex ; aedeagus not broadened apicad ; vesica with two or three tapered cornuti 13

13 (12) Arm of sacculus not extended beyond two-thirds ventral margin of valve, tapered and angled through 90° at middle (Text-fig. 4) ; endemic on island of Réunion . . . . . ***acaciaria*** (p. 16)

– Sacculus not so formed, species not occurring on island of Réunion . . 14

14 (13) Arm of sacculus parallel with and extending to four-fifths ventral margin of valve (Text-fig. 19) . . . . . ***papillifer*** (p. 25)

– Arm of sacculus arcuate or sinuous, tip extending to dorsal margin of valve . 15

15 (14) Arm of sacculus bluntly tapered and sinuous (Text-fig. 7) ; wing-span of moth usually 30–35 mm. ; endemic on Comoro Is. . . ***transversaria*** (p. 18)

– Arm of sacculus finely tapered ; wing-span of moth usually 40–45 mm. ; not found on Comoro Is. 16

16 (15) Aedeagus six times as long as broad, one and one-half times as long as dorsal margin of valve (Text-fig. 14) . . . . . ***flavivenata*** (p. 22)

– Aedeagus almost eight times as long as broad, twice as long asdorsal margin of valve (Text-fig. 11) . . . . . ***betularia*** (p. 20)

17 (8) Arm of sacculus of almost even width, slightly spiral and extending parallel with and almost to apex of folded ventral margin of valve ; vesica without cornuti (Text-figs. 41, 42) . . . . . ***carcassoni*** (p. 36)

– Sacculus not so formed 18

18 (17) Arm of sacculus slender and spatulate, dorsal margin partly fused with dorsal margin of valve, ventral margin serrate and parallel with ventral margin of valve ; long, very slender digitate process at base of sacculus (Text-figs. 47, 48) 19

– Sacculus not so formed 20

19 (18) Serrate-edged process on sacculus one and one-half times as long as greatest width of valve (Text-fig. 47) ; endemic on São Thomé I. ***subcincta subcincta*** (p. 43)

– Serrate-edged process on sacculus twice as long as greatest width of valve (Text-fig. 48) ; continental Africa. . . ***subcincta longifibulata*** (p. 43)

20 (18) Arm of sacculus extending parallel with apical half of ventral margin of valve, rasp-like, being densely and coarsely spined for full length of dorsal surface ; a short, blunt digitate process at base of sacculus (Text-fig. 44) . . 21

– Sacculus not so formed 22

21 (20) Vesica with two cornuti (Text-fig. 45) . . . . ***herbuloti*** (p. 38)

– Vesica without cornuti . . . . . ***acerata*** (p. 41)

22 (20) Sacculus with one or more well sclerotized, tapered processes, each as long as, or longer than uncus, the apices curving through 90° 23

– Sacculus not so formed 24

23 (22) Sacculus with two tapered processes, each smooth to tip ; vesica with one cornutus equal in length to width of aedeagus (Text-figs. 72, 73) ***bicornis*** (p. 57)

– Sacculus with one tapered process, the apex serrate-edged ; vesica with two stout, tapered cornuti fused at base, each two-thirds as long as aedeagus (Text-figs. 66, 67) . . . . . ***quadrimaculata*** (p. 53)

24 (22) Cucullus almost circular and projecting beyond ventral margin of valve ; sacculus with a curved, tapered process arising from near mid-valve, with or without additional processes 25

– Cucullus and sacculus not so formed 26

25 (24) Sacculus with a short truncate process at one-third ventral margin of valve ; vesica with one long and one short cornutus (Text-figs. 25, 26) ; endemic on Principe I. . . . . ***tamsi*** (p. 28)

– Sacculus smooth along ventral margin and without additional process ; vesica with one tapered cornutus (Text-figs. 28, 29) ; endemic on São Thomé I. ***viettei*** (p. 30)

26 (24) Scobinate medial plate of gnathus broader than greatest width of cucullus and with two scobinate arms projecting dorsally, one at each side ; process from sacculus extends along mid-valve and is tipped with stout spines, varying in number from 1–13 ; vesica with two cornuti, one scobinate, one tapered and smooth (Text-figs. 51, 52) . . . . ***lacrymata*** (p. 44)

– Genitalia not so formed 27

27 (26) Vesica with two cornuti fused at base, the longer finely or coarsely scobinate for varying distances to and including apex, which may be tapered, truncate or dilate 28

– Vesica with two cornuti fused at base, the longer usually smooth, but if scobinate only lightly so and always smooth in apical eighth 35

28 (27) Longer cornutus coarsely scobinate, scobination extending basad from apex, but not into basal half ; arm of sacculus not scobinate 29

– Longer cornutus of even width, slightly arcuate and finely scobinate in apical two-thirds ; arm of sacculus spatulate and densely but finely scobinate (Text-figs. 141, 142) . . . . . ***radula*** (p. 104)

29 (28) Apex of larger cornutus dilate to one and one-half times width at middle, apical perimeter with 8–10 spines 30

– Apex of larger cornutus of even width or tapered 31

30 (29) Scobinate medial plate of gnathus broad and shallow, equal in width to cucullus; apex of sacculus truncate with a short digitate process inclined towards mid-valve ; larger cornutus slightly sinuous (Text-figs. 90, 91) . . . ***plax*** (p. 71)

– Scobinate medial plate of juxta produced and narrowed, tip equal in width to one-third width of cucullus ; apex of sacculus with short, triangular, membranous projection at two-thirds ventral margin of valve ; larger cornutus straight (Text-figs. 87, 88) . . . . . ***tulbaghata*** (p. 67)

31 (29) Apex of aedeagus produced and narrowed by one-half, irregular in shape ; basal half of shorter cornutus bulbous, apical half slender and curved through 45° (Text-fig. 79) . . . . . ***dactylata*** (p. 60)

– Apex of aedeagus narrowed slightly and evenly rounded. 32

32 (31) Apex of shorter cornutus curved through 45° and usually bearing 2–5 spines varying in size (Text-fig. 76) . . . . . ***dargei*** (p. 58)

– Shorter cornutus straight and tapered 33

33 (32) Sacculus with process developed at two-thirds ventral margin of valve. . 34

– Sacculus without process (Text-fig. 93) . . . . . ***munda*** (p. 71)

34 (33) Scobination of gnathus extending along basal part of subscaphium ; sacculus with curved, spatulate process at two-thirds ventral margin of valve, the surface minutely pustulate and setose ; shorter cornutus one-half as long as longer one (Text-figs. 81, 82) . . . . . ***thyris*** (p. 62)

– Scobination of gnathus not extending along subscaphium ; a short, smooth spatulate process from apex of sacculus at two-thirds ventral margin of valve ; shorter cornutus one-third as long as longer one (Text-figs. 84, 85) ***nigrisparsalis*** (p. 64)

35 (27) Mid-dorsal margin of valve with a heavily spined, semi-circular dilatation extending towards mid-valve, spining continuous with that of cucullus ; apex of sacculus in form of broad, blade-like process (Text-fig. 97) ***lamottei*** (p. 73)

– Valve not so developed 36

36 (35) One or both cornuti spined 42

– Both cornuti quite smooth 37

37 (36) Tip of uncus produced, tapered and depressed ; apical process of sacculus slight, about as long as diameter of mid-uncus ; two groups of setose, digitate processes, one at mid-valve, one nearer ventral margin ; apex of juxta broadly V-shaped and rugose ; gnathus slender (Text-fig. 103) ***rostella*** (p. 77)

– Uncus, valve and gnathus not so formed 38

38 (37) Apical process on sacculus sclerotized and greater in length than diameter of uncus 39

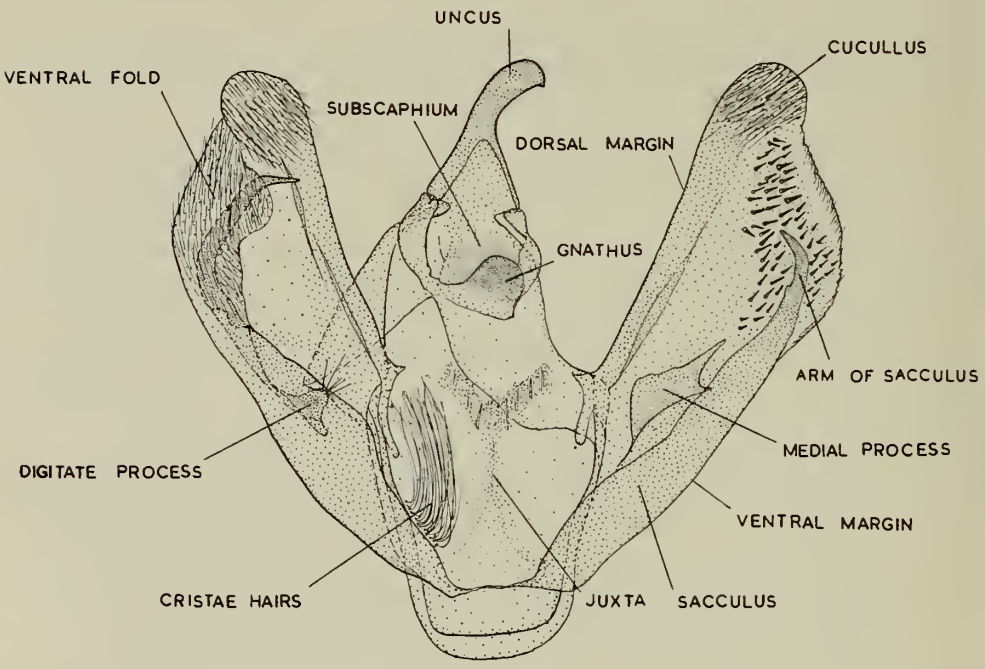
– Apical process on sacculus membranous and shorter than diameter of uncus, or wanting 40

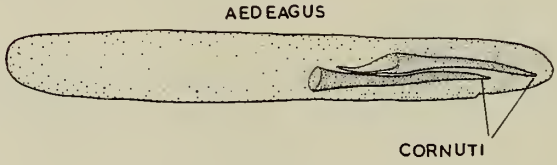
39 (38) Apical process on sacculus strongly sclerotized and extending to seven-eighths ventral margin of valve (Text-fig. 118) ; endemic on Madagascar
macracantha (p. 87)

– Apical process on sacculus sclerotized as above, but extending only to two-thirds ventral margin of valve (Text-fig. 121) ; continental Africa only
derogaria (p. 89)

40 (38) Ventral margin of valve quite smooth ; cucullus and most of dorsal margin of valve densely clothed with very long setae (Text-fig. 105) ; endemic on Madagascar . . . . . ***legrasi*** (p. 80)

– Valve not so developed 41





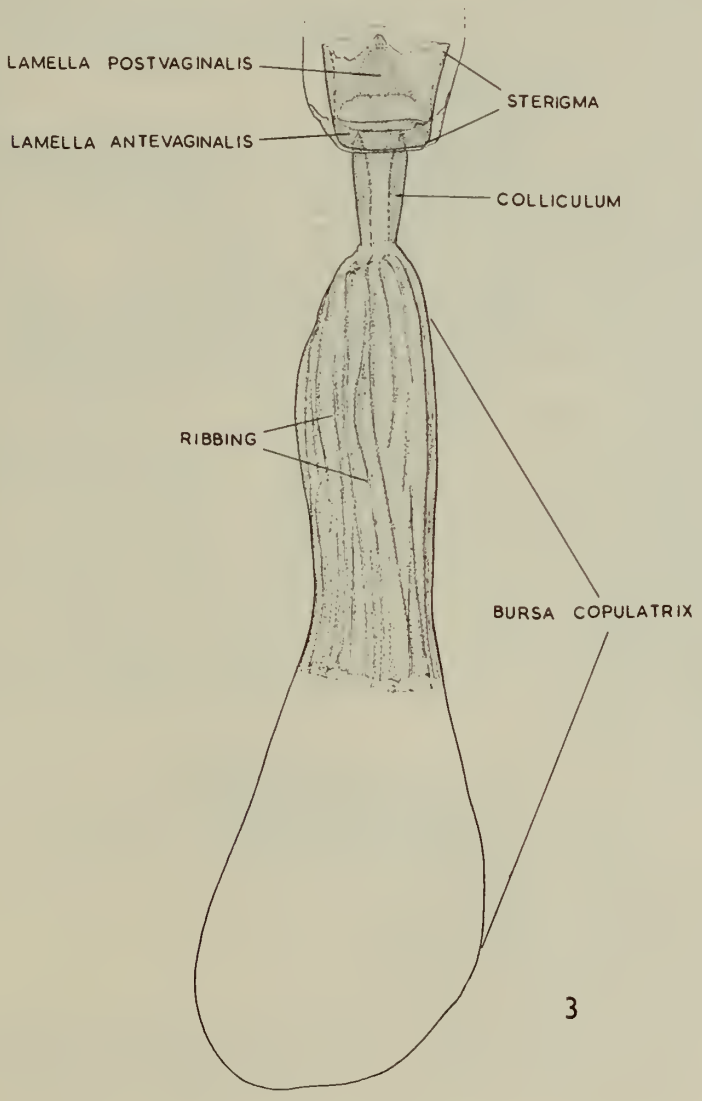
FIGS. 1–3. *Cleora* fabricated genitalia. 1, ♂ ; 2, aedeagus ; 3, ♀ (opposite page).

41 (40) Minute membranous apical process on sacculus at two-thirds ventral margin of valve ; one or more setose digitate processes at mid-valve (Text-fig. 112) ***serena*** (p. 84)

– Valve slightly narrowed at two-thirds ventral margin, but no apical process developed on sacculus ; two or more minute digitate processes at mid-valve ; cucullus with 4–8 tubercle-like projections from dorsal margin towards mid-valve (Text-fig. 109) ; endemic on Comoro Is. . . . ***angustivalvis*** (p. 82)

42 (36) Longer of two cornuti smooth and without spines ; shorter cornutus tipped with a cluster of spines or edged with a few spines 43

– Longer of two cornuti scobinate on one surface from one-half to seven-eighths, apical eighth smoothly tapered ; shorter cornutus smooth or partially scobinate 44



43 (42) Sacculus sclerotized and dilate towards mid-valve in apical third ; apex of sacculus minutely produced at two-thirds ventral margin of valve ; shorter cornutus tipped with a cluster of spines or spined at one side in apical eighth (Text-figs. 144, 145) . . . . . ***rothkirchi*** (p. 108)

– Apex of sacculus setose, sometimes with a minute, membranous projection at two-thirds ventral margin of valve ; shorter cornutus finely tapered at apex, apical half of one surface with 6–7 adpressed spines (Text-figs. 115, 116) ***oligodranes*** (p. 86)

44 (42) Process from apex of sacculus cylindrical, cygnate and scobinate, one and one-fourth times as long as width of cucullus ; shorter cornutus smooth (Text-figs. 136, 137) . . . . . ***lima*** (p. 100)

– Sacculus not so formed 45

45 (44) Apical third of sacculus dilate and scobinate, more heavily on inner surface, scobination extending to cover over-curved, spatulate apex ; shorter cornutus usually smooth, but occasionally one or two adpressed spines mid-way along one surface (Text-figs. 99, 100) . . . . ***toulgoetae*** (p. 76)

– Sacculus not so formed 46

46 (45) Process from apex of sacculus slender, spatulate and scobinate, equal in length to uncus and incurved slightly apicad ; base of gnathus one and one-fourth times as broad as cucullus, scobination extending posteriorly along subscaphium for distance equal to one-half of its width ; shorter cornutus with adpressed spines along one surface (Text-figs. 138, 139) . ***scobina*** (p. 101)

– Sacculus not so formed 47

47 (46) Apical third of spacculus broadly spatulate, apex produced and narrowly rounded, minutely and densely scobinate ; gnathus broader at base than cucullus, scobination extending posteriorly along subscaphium (Text-fig. 134) ***pavlitzkiae saltuensis*** (p. 98)

– Sacculus not so formed 48

48 (47) Apical projection from sacculus spatulate and slender, apex not incurved (Text-fig. 127) . . . . . ***pavlitzkiae lamella*** (p. 94)

– Sacculus not so formed, apex incurved 49

49 (48) Apical projection from sacculus blunt, setose but not scobinate and only one-eighth as broad as cucullus (Text-fig. 124) . ***pavlitzkiae pavlitzkiae*** (p. 92)

– Apical projection from sacculus spatulate, scobinate and broader than one-eighth width of cucullus 50

50 (49) Apical projection from sacculus one-fourth as broad as cucullus and incurved through 90° (Text-fig. 129) . . . ***pavlitzkiae etesiae*** (p. 94)

– Apical projection from sacculus one-third as broad as cucullus and obtusely incurved (Text-fig. 131) . . . . ***pavlitzkiae oriadelpha*** (p. 98)

Cleora acaciaria (Boisduval)

(Text-figs. 4–6 ; Pl. 1, figs. 147–151 ; Map 1)

Boarmia acaciaria Boisduval, 1833 : 264.
Boarmia acaciaria Boisduval, 1833a : 116, pl. 16 : 4.
Boarmia acaciaria Boisduval ; Guenée *in* Maillard, 1862 : 29.
Cleora acaciaria (Boisduval) Vinson, 1938 : 38.
Neocleora acaciaria (Boisduval) Viette, 1954 : 509.
Neocleora acaciaria (Boisduval) ; Herbulot, 1957 : 234.

♂. Crest on first abdominal segment white. Vestiture and wings tilleul buff varyingly suffused with cinnamon brown and tawny ; tilleul buff ground colour clearly discernible on wings only in medial area of two examples ; postmedial fascia black, slender and sharply

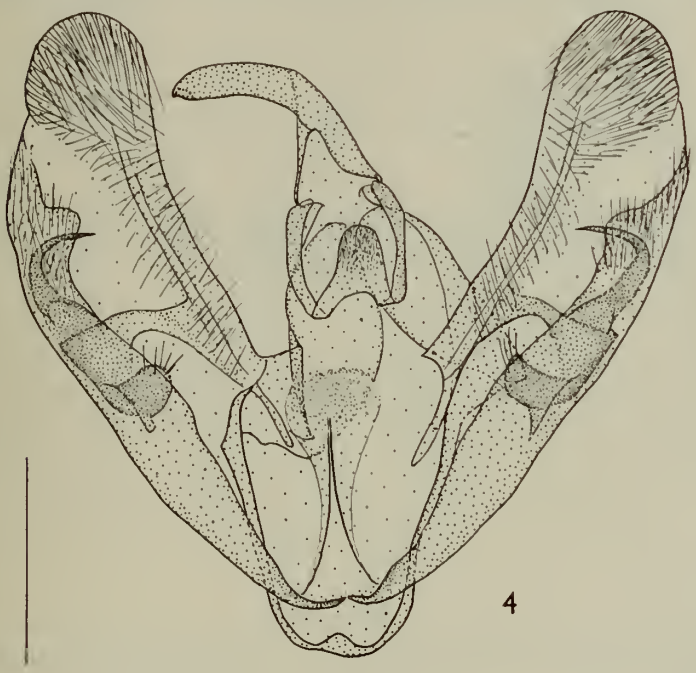
defined ; in two examples discal spot wholly black (Pl. 1, fig. 147). Under surface of wings tilleul buff densely suffused with fuscous (Pl. 1, fig. 150).

♂. Genitalia (Text-figs. 4, 5). Tip of uncus evenly tapered and rounded, and sclerotized as in figure ; arm of sacculus incurved through 90°, finely tapered and covered, except for tip, by a setose, membranous fold from ventral margin of valve ; short setose, digitate process at base of arm ; apex of aedeagus rounded ; vesica with two cornuti, each one-third as long as aedeagus.

♀. Ground colour of wings white, lightly irrorate with drab and fuscous ; postmedial fascia on each wing black, slender and sharply defined. Under surface of wings white, irrorate and patterned with fuscous. In two examples, area proximad of antemedial fascia on fore wing and a broad band distad of postmedial fascia on each wing cinnamon brown (Pl. 1, figs. 149, 151).

♀. Genitalia (Text-fig. 6). Lamella postvaginalis as in figure ; colliculum narrowed to two-thirds in anterior half, equal in length to posterior width ; bursa copulatrix pyriform ; anterior third membranous, remainder lightly sclerotized.

Measurements. ♂ 38–42 mm. ; ♀ 38–48 mm.



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5

6

FIGS. 4–6. *C. acaciaria* genitalia. 4, ♂ ; 5, aedeagus ; 6, ♀.

Ascotis terebraria (Guenée), the only other species known from the island of Réunion with which *acaciaria* might be confused, differs externally in the antennae of both sexes, there being two pairs of pectinations instead of one pair to each pectinate segment in the male ; in the female there are two pairs of short bristles instead of one pair to each segment. In both sexes the genitalia are diagnostic.

Acaciaria has been recorded widely in the literature from other parts of the Mascarene region, from continental Africa and from the Indo-Australian region ; these records are based on misidentifications, for *acaciaria* is endemic on the island of Réunion.

The type, which should have passed to Oberthür with the rest of the Boisduval collection, cannot be found either in the British Museum (Natural History) or in the National Museum in Paris. Boisduval's illustration is, however, adequate for identification.

Distribution (Map 1). Island of Réunion.

Material examined. RÉUNION : (*Dr. Roussel*), 4 ♂, 3 ♀ ; ibid. (*Maillard*), 1 ♀ ; ibid., 21–30.v.1922 (*G. F. Leigh*), 3 ♂, 4 ♀.

Cleora transversaria (Pagenstecher) **comb. n.**

(Text-figs. 7–9 ; Pl. 1, figs. 152–165 ; Map 1)

Boarmia transversaria Pagenstecher, 1907 : 97, pl. 6 : 4.

♂. Genitalia (Text-figs. 7, 8). Arm of sacculus curved through 90° towards dorsal margin of valve, then ventrad and again towards dorsal margin, the greater part covered by a setose, membranous fold from ventral margin of valve ; apex of arm bluntly tapered ; a small, setose process at base of arm ; apex of aedeagus narrowed and rounded ; vesica with two tapered cornuti, one with a curved apex and two-fifths as long, the other straight and one-third as long as aedeagus.

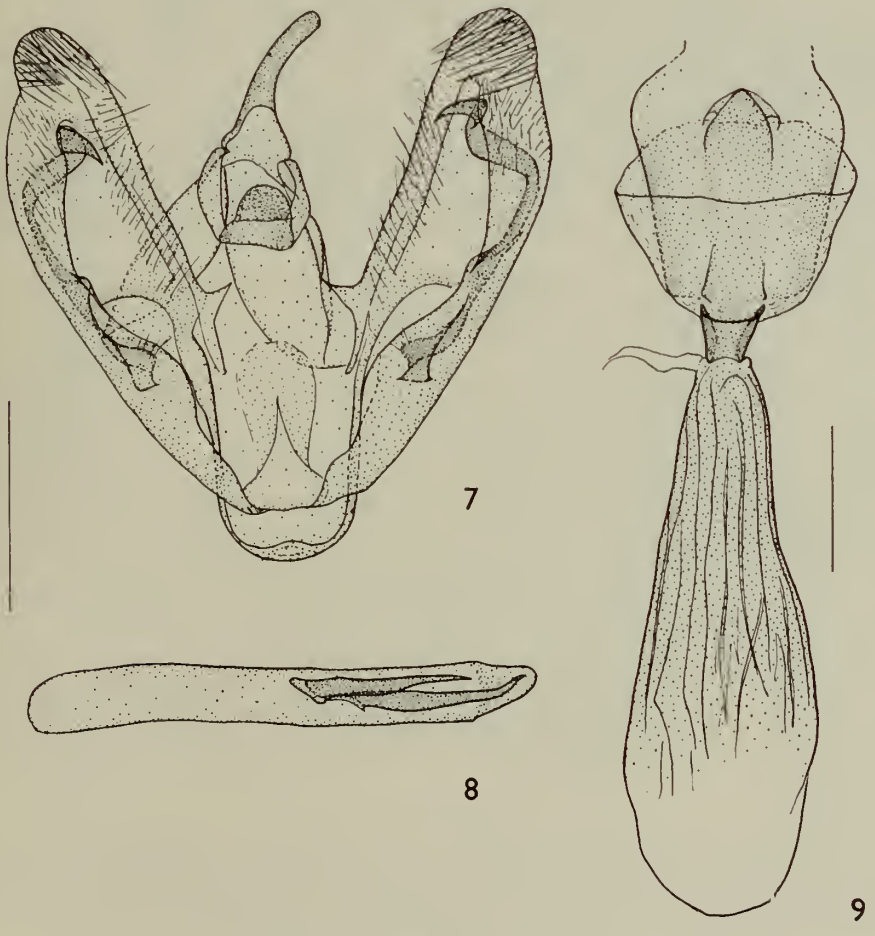
♀. Genitalia (Text-fig. 9). Lamella postvaginalis weakly sclerotized and shaped as in figure ; bursa copulatrix pyriform, posterior two-thirds ribbed and lightly sclerotized, anterior third membranous.

Measurements. ♂ 29·5–35 mm. ; ♀ 33–37 mm.

Closely related to *acaciaria* and to the following two species, *betularia* and *flavivenata*, and sharing with *acaciaria* and *betularia* a remarkably wide and similar polymorphism, examples of which are illustrated on Pl. 1. Figs. 152 and 160 illustrate a male and a female of the form most commonly represented in collections. In the male the tilleul buff ground colour of the wings is irrorate with drab and fuscous, more densely proximad of the medial fascia on the fore wing and distad of the postmedial fascia on each wing ; distad of the postmedial fascia on each wing there is an irregular band of cinnamon buff to cinnamon brown. The female differs in having the ground colour of the wings white. Figs. 154 and 158 represent a form similar to the preceding, but with wholly black discal spots. Figs. 157, 161 and 162 represent a form in which the fuscous black medial fascia is strongly developed on each wing and from which a lateral streak extends distally in the discal fold of the fore wing. Figs. 153 and 159 represent a form in which the medial area of each

wing and the basal area of the hind wing are almost immaculate, except for the discal spots. In the male (fig. 153) the remainder of the wings are densely irrorate with drab ; in the female (fig. 159) the corresponding dark areas are cinnamon brown. Fig. 155 represents a form in which the wings are densely suffused with fuscous, except along the costa of the fore wing and in the posterior half of the hind wing. Fig. 156 represents a form with a dark tilleul buff ground colour to the wings, intensified terminad ; the medial area in this form, posterior of the subcostal vein, is intensely fuscous black. Fig. 163 represents a female in which there is a broad fascia of warm buff instead of the postmedial fascia on each wing and a similar fascia on the fore wing proximad of the antemedial fascia.

The species evidently represents *acaciaria* in the Comoro Islands, as *betularia* and *flavivenata* do in continental Africa. So far no representative of this species-group has been found in Madagascar.



FIGS. 7–9. *C. transversaria* genitalia. 7, ♂ ; 8, aedeagus ; 9, ♀.

With so wide a range of colour and pattern, the best diagnostic characters are to be found in the genitalia ; in the male the shape of the arm of the sacculus and in the female the form of the sterigma and the proportions of the bursa copulatrix are distinctive.

Distribution (Map 1). Comoro Islands ; endemic.

Material examined. Holotype ♂ : Gr.-Comoro (*Voeltzkow S.*), in Zoological Museum, Berlin.

Grande Comoro : 26.ix.1911 (*G. F. Leigh*), 1 ♂ ; ibid., ix.1921, 2 ♀ ; ibid., x.1921, 2 ♂ ; ibid., xi.1921, 1 ♂ ; ibid., bred, 1.viii.1921, 1 ♂ ; Grande Comore (*L. Humblot*), 70 ♂, 70 ♀. Mayotte : 1–5.v.1911 (*G. F. Leigh*), 1 ♂ ; ibid., 27–31. v.1911, 1 ♀.

Cleora betularia (Warren) comb. n.

(Text-figs. 10–12 ; Pl. 2, figs. 166–175 ; Map 1)

Chogada betularia Warren, 1897 : 93.
Chogada funesta Warren, 1905 : 398.
Neocleora betularia (Warren) Janse, 1932 : 271, pl. 8 : 7, text-fig. 100.

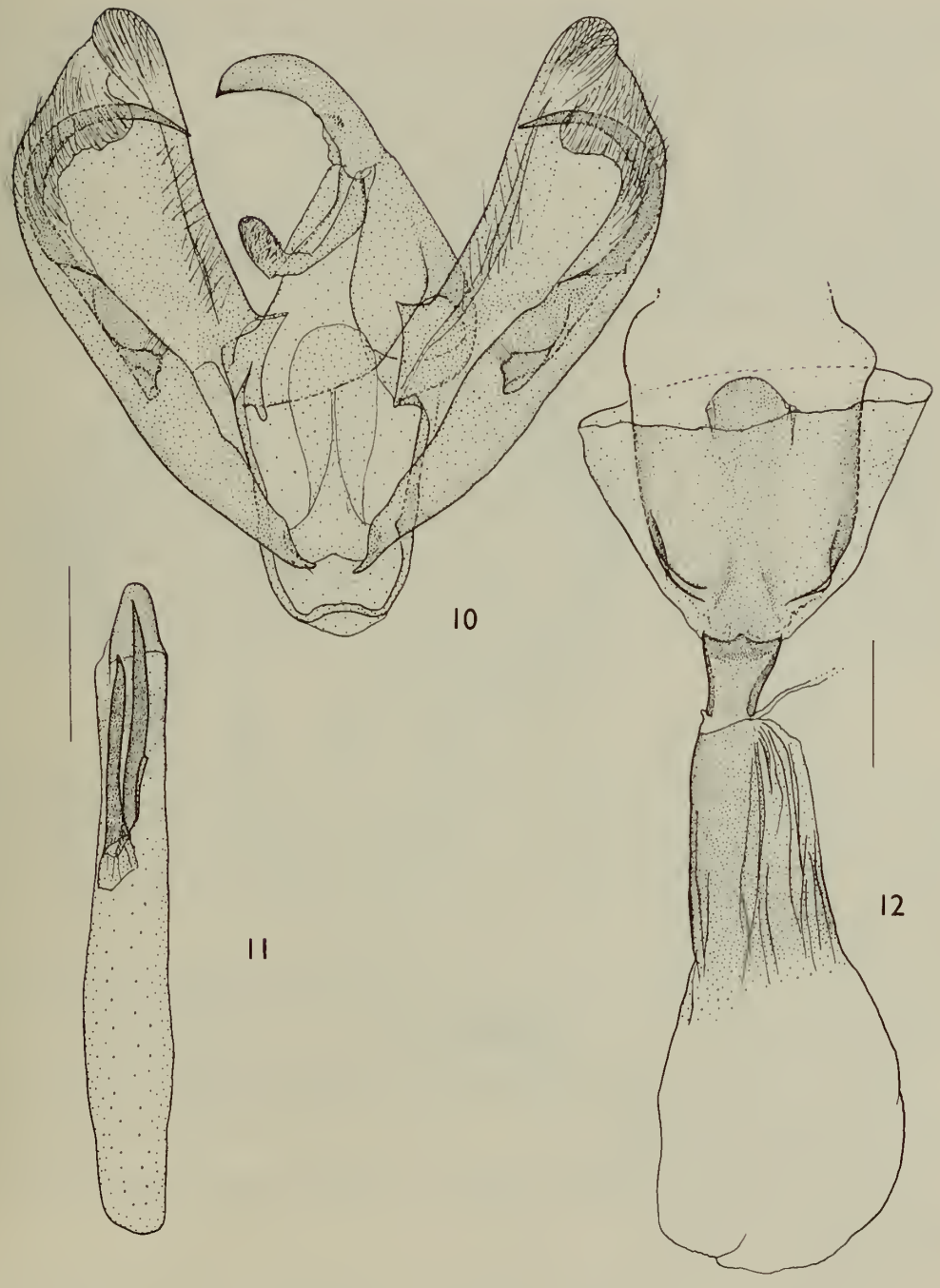
♂. Genitalia (Text-figs. 10, 11). Arm of sacculus arcuate and tapered and, except for tip, covered by a setose, membranous fold from ventral margin of valve ; aedeagus long and slender, eight times as long as mean width and twice as long as dorsal margin of valve, with a narrowly rounded apex ; vesica with two tapered cornuti, each slightly longer than one-third of length of aedeagus.

♀. Genitalia (Text-fig. 12). Sterigma sclerotized as in figure ; anterior half of bursa copulatrix membranous, remainder ribbed and sclerotized, strongly at left side.

Measurements. ♂ 45–50 mm. (*funesta* holotype 35 mm.) ; ♀ 50 mm.

An exceedingly variable species, displaying a range of polymorphism in the male (Pl. 2, figs. 166–175) similar to that found in *transversaria ;* the few females for study vary little. In the male lectotype the light buff ground colour of the upper surface of the wings is evenly irrorate with fuscous, comparable with the typical form of the palaearctic *Biston betularia* (Linnaeus) ; several male examples from Marieps Mtn. are entirely suffused with smoke grey, others have on the fore wing a strongly developed black medial fascia fusing with a black lateral streak in the discal fold (Pl. 2, figs. 170, 172). In some examples the medial area of the fore wing and the proximal half of the hind wing are suffused with black (Pl. 2, fig. 174) ; in other examples these areas are of the ground colour only very sparsely irrorate with fuscous (Pl. 2, fig. 168) ; in each of these latter two forms the remainder of each wing is cinnamon buff. The underside of each wing is white to tilleul buff suffused and marked with drab, the pattern similar to that of the upperside (Pl. 2, figs. 167, 169, 171, 173, 175).

Closely related to *transversaria*, differing externally in the appreciably greater size and the rather more produced apex of the fore wing ; differing structurally in the shape of the arm of the sacculus in the male genitalia and in the shape and sclerotization of the sterigma and in the degree and extent of the sclerotization of the bursa copulatrix in the female genitalia.



FIGS. 10–12. *C. betularia* genitalia. 10, ♂ ; 11, aedeagus ; 12, ♀.

The holotype of *funesta* collected by G. F. Leigh at Durban and another male with identical data each has a wing-span of 35 mm. ; these may represent a dry season form, or if reared, as much of Leigh's material is, they may be starvlings.

Biology. A pupa was found on *Pinus patula* in Malawi.

Distribution (Map 1). Malawi ; Rhodesia ; Transvaal ; Natal ; Cape Province.

Material examined. Types. Of the two male syntypes of *Chogada betularia* labelled " S. Africa ", I select as LECTOTYPE the specimen from which the genitalia slide Geometridae No. 2143 has been made ; the paralectotype was labelled by Warren " *Chogada betularia* Warren, Type ♂ ", but is without abdomen.

Holotype ♂ of *Chogada funesta* Warren : Natal, Durban, (*G. F. Leigh*) Geometridae genitalia slide No. 1575.

Malawi : Zomba Plateau, pupa ex *Pinus patula*, emerged 19.xii.1962 (*R. C. H. Sweeny*), 1 ♂ ; Little Ruo Plateau, Mt. Mlanje, 6400 ft., 3.viii.1956 (*A. W. R. McCrae*), 1 ♂. Transvaal : Marieps Mtn., 1–9.i.1926 (*G. van Son*), 10 ♂, 4 ♀, in British Museum (Natural History), 5 ♂ in Transvaal Museum. Natal : 1 ♂ ; Karkloof, 17.i.1917 (*E. E. Platt*), 1 ♂ ; ibid., 13.i.1918, 1 ♂ ; Durban (*G. F. Leigh*), 1 ♂ ; Balgowan, 5.ii.1951 (*K. M. Penniton*), 1 ♂ in Transvaal Museum ; ibid., 12.ii.1951, 1 ♂ ; ibid., 9.xii.1951, 1 ♂ ; Mont-aux-Sources, Natal National Park, 1 ♂ in Transvaal Museum. Cape Province : Katberg, 4000 ft., x.1933 (*R. E. Turner*), 1 ♂ ; Wilderness, Knysna Forest, 20.x–8.xi.1952, at M.V. light (*H. B. D. Kettlewell*), 1 ♀ ; Engcobo, 3.i.1954 (*D. A. Swanepoel*), 1 ♂ in Transvaal Museum.

Cleora flavivenata sp. n.

(Text-figs. 13–15 ; Pl. 3, figs. 176–179 ; Map 1)

♂. Crest on first abdominal segment white ; remainder of vestiture white, irrorate with drab grey and fuscous black. Upper surface of wings white, irrorate with drab grey and fuscous black ; transverse fasciae and lateral streak in discal fold of fore wing fuscous black, slender and sharply defined ; broad cinnamon brown to russet bands proximad of antemedial fascia on fore wing and distad of postmedial fascia on each wing ; veins, except subcostal vein of fore wing, streaked with ochraceous buff (Pl. 3, fig. 176). Under surface of wings tilleul buff, irregularly suffused and patterned with fuscous (Pl. 3, fig. 177).

♂. Genitalia (Text-figs. 13, 14). Arm of sacculus arcuate and finely tapered and, except for tip, covered by a setose, membranous fold from the ventral margin of the valve ; aedeagus six and one-half times as long as mean width and one and one-half times as long as dorsal margin of valve, with broadly rounded apex ; vesica with two tapered cornuti, each slightly less than one-third as long as aedeagus.

♀. Similar to male, but drab grey and fuscous black irroration sparse, except in distal third of each wing ; cinnamon brown to russet bands narrower ; in some examples veins less strongly streaked with ochraceous buff (Pl. 3, fig. 178). Under surface of wings usually less suffused with fuscous proximally (Pl. 3, fig. 179).

♀. Genitalia (Text-fig. 15). Sterigma sclerotized as in figure ; bursa copulatrix pyriform with slight projection medio-laterally ; anterior two-thirds membranous, remainder weakly ribbed and weakly sclerotized.

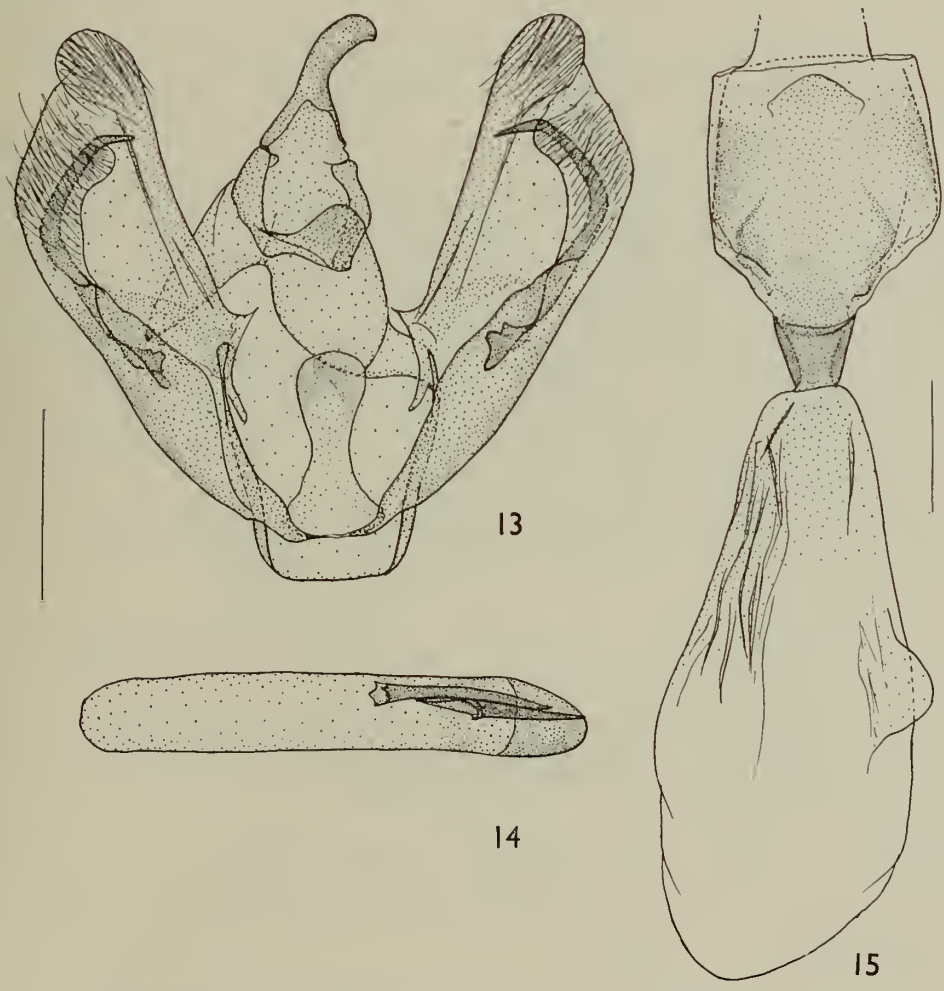
Measurements : ♂ 40–45 mm. ; ♀ 46–50 mm.

The series from Kirstenbosch and Cape Town displays very little variation in colour and pattern, except in the degree of dark irroration of the upper surface of

the wings ; specimens from the Knysna localities, Wilderness, Garden of Eden, Sourflats and the Groot River Pass however are paler, the males markedly so, resembling the females in colour. The single example from Camps Bay, Cape Town is also pale ; the examples from Port St. Johns are intermediate.

Closely related to *betularia*, differing externally, especially in the male, in the clear ochraceous buff streaking on the veins on the upper surface of the wings. Structurally the size of the aedeagus in the male genitalia and the pattern of sclerotization of the sterigma and the shape and weak sclerotization of only the posterior third of the bursa copulatrix in the female genitalia are diagnostic. Externally similar in colour and pattern to forms of *tulbaghata* and *munda ;* from these species *flavivenata* may be clearly separated by the genitalia of both sexes.

Distribution (Map 1). South Africa, Cape Province.



FIGS. 13–15. *C. flavivenata* genitalia. 13, ♂ ; 14, aedeagus ; 15, ♀.

Holotype ♂. Cape Town, Kirstenbosch, 5–29.xii.1954 (*A. J. T. Janse*), in Transvaal Museum.

Paratypes : 13 ♂, 5 ♀ with same data as holotype ; Cape Province, Camps Bay, 17.xii.1955 (*A. J. Duke*), 1 ♂, all in Transvaal Museum ; Cape Town, iii.1912 (*Lord Gladstone*), 1 ♂ ; ibid., v.1912, 1 ♂ ; Cape Province, Harkerville, 9.iii.1921 (*Dr. H. G. Breijer*), 1 ♂ ; Knysna, Wilderness, 20.x–8.xi.1952, at M.V. light (*H. B. D. Kettlewell*), 6 ♂, all in British Museum (Natural History) ; Knysna, Sourflats, 22–24.xi.1954 (*L. Vari*), 1 ♂ ; Knysna, Garden of Eden, 16–20.i.1955 (*A. J. T. Janse*), 5 ♀ ; Groot River Pass, 21–23.i.1955 (*A. J. T. Janse*), 1 ♀ ; Port St. Johns, 10–22.ii.1955 (*A. J. T. Janse*), 3 ♂, all in Transvaal Museum.

Cleora melanochorda (Fletcher) **comb. n.**

(Text-figs. 16–18 ; Pl. 3, figs. 180–182, 184–186 ; Map 1)

Neocleora melanochorda Fletcher, 1958 : 137, figs. 42, 76, 216.

♂. Fore wing : medial area white except along costa and distad of broad, black, medial fascia posterior of vein M_3 ; remainder of wing cinnamon drab, lightly irrorate with fuscous and, distad of postmedial fascia, white ; ante- and postmedial fasciae black, sharply defined ; subterminal fascia fuscous, represented only by spots between costa and vein Sc_3 and between vein M_1 and M_3. Hind wing, proximad of medial fascia, white, lightly irrorate with fuscous at base, otherwise similar to fore wing (Pl. 3, fig. 180). Underside of wings tilleul buff ; costa of fore wing and distal third of each wing varyingly suffused with cinnamon drab and with fuscous at apex of fore wing ; discal and terminal interneural spots fuscous (Pl. 3, fig. 184).

♂. Genitalia (Text-figs. 16, 17). Arm of sacculus aculeate, parallel with ventral margin of valve and extending to cucullus ; a small setose, digitate process at base of arm ; vesica with a stout cornutus shallowly bifurcate at apex, rather longer than one-half length of aedeagus.

♀. Not known from type locality.

♀. Genitalia (Text-fig. 18), based on a specimen from Kenya. Sterigma wrinkled laterally ; two parallel, longitudinal ribs along lamella antevaginalis ; posterior two-thirds of bursa copulatrix ribbed, posterior third lightly sclerotized ; anterior third membranous.

Measurements. Holotype ♂ 50 mm. ; Kenya ♂ 46 mm. ; ♀ 48 mm.

The colour and pattern of the holotype is striking, but probably represents only one form of a polymorphic species having a range of variation comparable with that of *betularia*. The two specimens from Kenya (Pl. 3, figs. 181, 182, 185, 186) have the ground colour of the wings light drab ; the transverse fasciae are black and the postmedial fascia on each wing is broadly edged distally with bister ; the genitalia of the male are identical with those of the holotype from Uganda ; those of the female are described above.

Related to *betularia* and *flavivenata* and representing the most northerly penetration so far known of the species-group. The shape of the arm of the sacculus and of the cornutus in the male genitalia and the configuration of the sterigma in the female genitalia are diagnostic.

Distribution (Map 1). Uganda (upper limits of montane rain forest on Ruwenzori) ; Kenya.

Material examined. Holotype ♂. UGANDA : Ruwenzori, Nyinabitaba, 8650 ft., 7–13.vii.1952 (*D. S. Fletcher*),Geometridae genitalia slide 1751.

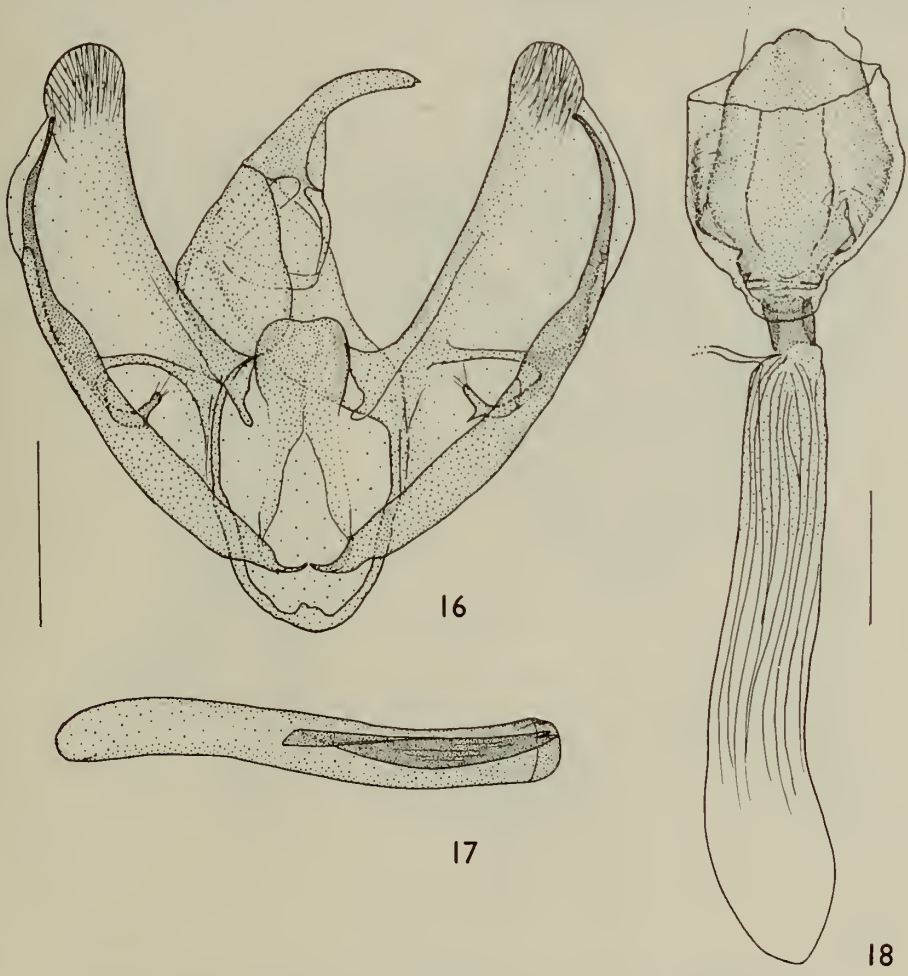
KENYA : Kitale, vii.1958 (*C. Howard*), 1 ♀ ; Mt. Elgon, x.1961 (*T. H. E. Jackson*), 1 ♂ in the Coryndon Museum.

Cleora papillifer Prout

(Text-figs. 19–21 ; Pl. 3, figs. 183, 187 ; Map 1)

Cleora papillifer Prout, 1934 : 89.

♂. Vestiture white, very lightly irrorate with ochraceous tawny and cinnamon brown. Fore wing white ; transverse fasciae slender and broken, cinnamon brown ; some cinnamon



FIGS. 16–18. *C. melanochorda* genitalia. 16, ♂ ; 17, aedeagus ; 18, ♀.

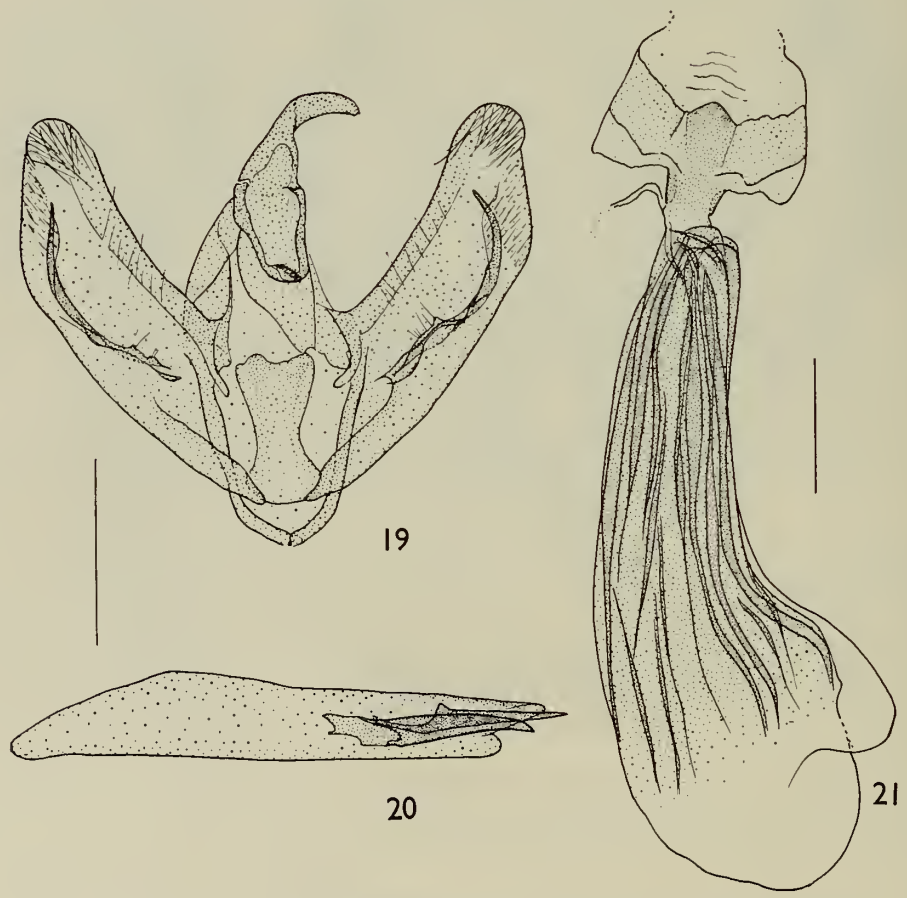
brown irroration in preterminal area of discal fold and near base of subcostal vein ; remainder of wing irrorate with ochraceous tawny, very lightly proximad of postmedial fascia ; discal spot weakly outlined in cinnamon brown. Hind wing white, lightly irrorate with ochraceous tawny distad of postmedial fascia ; medial and postmedial fasciae as on fore wing ; tornus cinnamon brown (Pl. 3, fig. 183). Underside of both wings white, patterned as illustrated with cinnamon brown (Pl. 3, fig. 187).

♂. Genitalia (Text-figs. 19, 20). Arm of sacculus tapered, parallel with and extending to four-fifths ventral margin of valve ; apical part covered by a small, setose, membranous fold extending from ventral margin of valve ; minute, setose ridge at base of arm ; vesica with two tapered cornuti, each one one-third as long as aedeagus.

♀. Similar to male externally.

♀. Genitalia (Text-fig. 21). Lamella postvaginalis with angular projection medio-posteriorly ; colliculum weakly sclerotized, shorter than broad ; bursa copulatrix dilate anteriorly, anterior fifth membranous with a short bulbous projection at right side, remainder strongly sclerotized and ribbed.

Measurements. ♂ 24 mm. ; ♀ 34 mm.



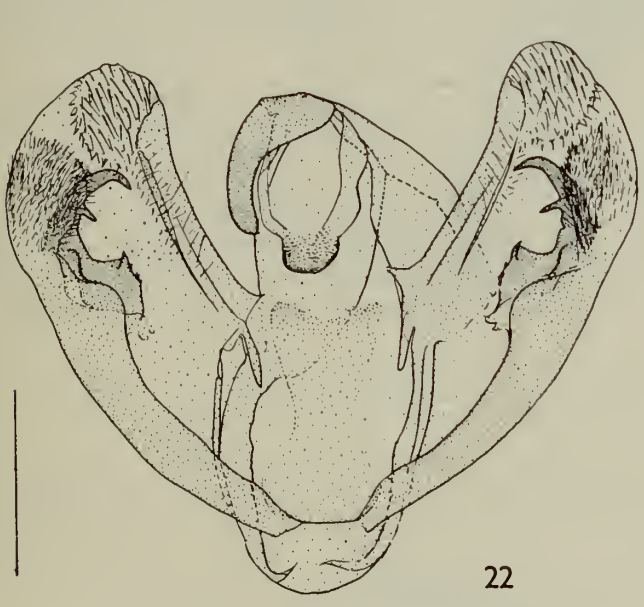
FIGS. 19–21. *C. papillifer* genitalia. 19, ♂ ; 20, aedeagus ; 21, ♀.

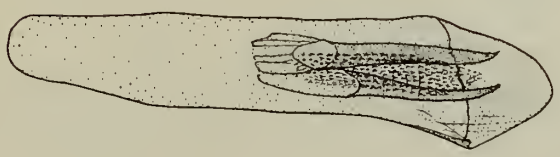
The wings are only sparsely scaled with the white ground colour, giving them a pearly, hyaline appearance, recalling, as the author noted in his original description, species of the neotropical genus *Iridopsis ;* this quality and the presence of cinnamon brown irroration in the preterminal area of the discal fold on the fore wing give the species a distinctive appearance. The structure of the valve indicates a close affinity with the *acaciaria* species-group ; the detail of the sacculus in the male and the form of the sterigma and bursa copulatrix in the female genitalia are diagnostic.

Distribution (Map 1). Central and Western Congo (Leopoldville).

Material examined. Holotype ♀ : [Congo (Leopoldville)] : Kisantu, 1929 (*R. P. J. Van Wing*), in Musée Royal de l'Afrique Centrale.

Paratype ♂ : [Congo (Leopoldville)] : Lusambo, Kassai, 12.ix.1919, in British Museum (Natural History).





Figs. 22–24. *C. cancer* genitalia. 22, ♂ ; 23, aedeagus ; 24, ♀.

Cleora cancer sp. n.

(Text-figs. 22–24 ; Pl. 3, figs. 188–191 ; Map 1)

♂. Vestiture white, densely irrorate with vinaceous buff and fuscous. Fore wing white, irrorate with vinaceous buff and fuscous, densely along costa ; apex suffused with light drab ; some ochraceous buff irroration in preterminal area of discal fold and in sub-basal area ; ante- and postmedial fasciae slender and fuscous black, the latter right-angled on vein M_2. Hind wing white, sparsely irrorate with vinaceous buff and fuscous ; some ochraceous buff irroration in preterminal area of discal fold ; medial fascia, from discal spot to anal margin, and slender postmedial fascia, the latter right-angled in discal fold, fuscous black. Underside of wings white patterned with fuscous black.

In two male and three female examples the medial fascia on each wing is strongly developed and from it a fuscous black horizontal streak extends along discal fold to termen (Pl. 3, figs. 188, 189).

♂. Genitalia (Text-figs. 22, 23). Arm of sacculus extending from one-half to five-sixths ventral margin of valve, apex bifurcate and claw-like, partially covered with a setose, membranous fold from the ventral margin of the valve ; process near base of claw-like structure broad and dentate on inner margin ; aedeagus broadened apicad ; vesica with two tapered cornuti, each three-sevenths as long as and a longitudinal, scobinate band one-third as long as aedeagus.

♀. Similar to male externally (Pl. 3, figs. 190, 191).

♀. Genitalia (Text-fig. 24). Lamella postvaginalis strongly sclerotized and shaped as illustrated ; colliculum with a short lip projecting ventrad ; anterior fifth of bursa copulatrix membranous, remainder ribbed and sclerotized.

Measurements. ♂ 44–47 mm. ; ♀ 45–49 mm.

The structure of the male genitalia shows a close affinity with *betularia ;* a tendency to a comparable variation in wing pattern is also apparent. Externally the marked right-angling of the postmedial fascia and structurally the shape of the sacculus and ornamentation of the vesica in the male and the lip on the colliculum in the female are diagnostic.

Distribution (Map 1). Ethiopia ; Kenya ; Burundi ; Malawi ; Transvaal.

Holotype ♂. KENYA : Ngong, Nairobi, vii.1954 (*Fowler & Coulson*).

Paratypes : [ETHIOPIA] ABYSSINIA: Harar, 22.xii.1938 (*R. E. Ellison*), 1 ♀ ; B.E.A. : Kibwezi, 18.v.1917 (*W. Feather*), 1 ♀ ; ibid., ii.1929, 1 ♀. BURUNDI : Usumbura, 900 m., 8.i.1962 (*Dr. M. Fontaine*), 1 ♂, in Musée Royal de l'Afrique Centrale. [MALAWI] NYASA : Zomba, vi.1923 (*H. Barlow*), 1 ♀. RHODESIA : Salisbury, 25.vi.1918 (*O'Neil*), 1 ♂. TRANSVAAL : Louws Creek, near Barberton, 26° S., 31°20″ E., xi.1922 (*H. G. Williams*), 1 ♂.

Cleora tamsi sp. n.

(Text-figs. 25–27 ; Pl. 4, figs. 192–196 ; Map 9)

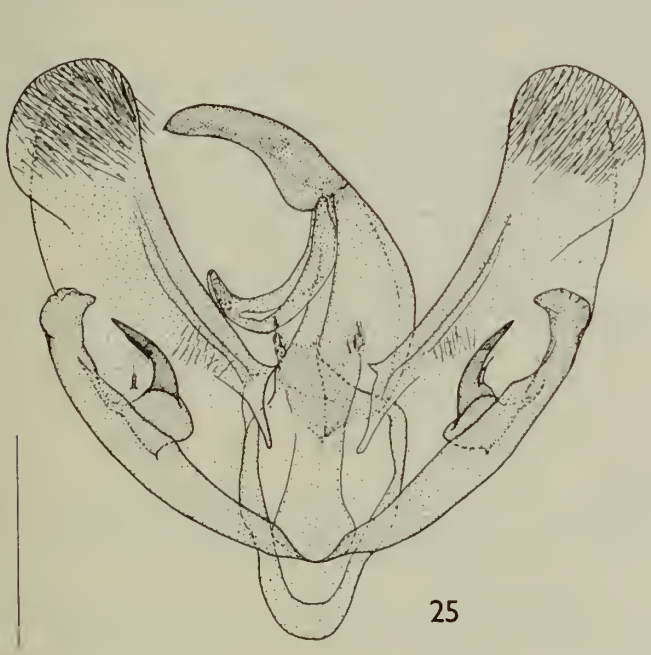
♂. Head cinnamon brown ; patagia fuscous with a few tilleul buff scales ; abdominal crest tilleul buff ; remainder of vestiture tilleul buff, irrorate with fuscous. Fore wing tilleul buff, irrorate with ochraceous buff, drab and fuscous ; sub-basal fascia broad and ill-defined ; ante- and postmedial fasciae fuscous black, sharply defined; horizontal fuscous black streak distad of postmedial fascia between veins M_2 and M_3 ; broad fascia of ochraceous buff and drab distad of and parallel with postmedial fascia ; discal spot white, outlined with fuscous black. Hind wing similar, but antemedial fascia wanting and medial fascia present (Pl. 4, fig. 192). Underside of both wings white, patterned as illustrated with bister ; discal spots fuscous black (Pl. 4, fig. 193).

♂. Genitalia (Text-figs. 25, 26). Membranous cucullus dilate and extending beyond ventral margin of valve ; sacculus with one truncate and one tapered, spine-tipped process, from which a second small spine sometimes arises, and also a minute setose digitate process ; vesica with two cornuti, one one-half as long as and one one-sixth as long as aedeagus.

♀. Similar to male externally, but less densely irrorate proximad of postmedial fascia (Pl. 4, figs. 194–195).

♀. Genitalia (Text-fig. 27). Sclerotization of lamella postvaginalis mitre-shaped in pattern; posterior edge of lamella antevaginalis semi-circular ; colliculum tapered anteriorly, posterior edge produced slightly medially ; bursa copulatrix membranous and dilate anteriorly, very weakly sclerotized and ribbed posteriorly.

Measurements. ♂ 35–40 mm. ; ♀ 40–44 mm.



FIGS. 25–27. *C. tamsi* genitalia. 25, ♂ ; 26, aedeagus ; 27, ♀.

A variable species developing forms comparable with those of *acaciaria* from Réunion and *transversaria* from the Comoro Is. (Pl. 4, fig. 196). The male genitalia of this and the following species, *viettei* from São Thomé I., each has a markedly dilate, membranous cucullus, a similarly stout uncus and a similarly shaped gnathus ; whilst their affinity with each other is clear, their relationship with other species in the genus is obscure. Because of the similarity of range of variation in wing-pattern, the dilate cucullus and the well developed sacculus, *tamsi* and *viettei* are placed after those species of the *acaciaria* group.

It is with pleasure that I name this species after Mr. W. H. T. Tams of this department, in token acknowledgement of his frequent, kindly advice.

Distribution (Map 9). Principe I. ; probably endemic.

Holotype ♂. W. Africa : Principe I., 19.xii.1932 (*W. H. T. Tams*).

Paratypes : St. Principe : 1500–2000 ft., iv–v.1923 (*T. A. Barns*), 15 ♂, 3 ♀ ; Principe I., 19–22.xii.1932 (*W. H. T. Tams*), 9 ♂, 3 ♀.

Cleora viettei (Herbulot) **comb. n.**

(Text-figs. 28–30 ; Pl. 4, figs. 197–202 ; Map 9)

Neocleora viettei Herbulot, 1958 : 103, fig. 1.

♂ ♀. Externally similar in both sexes to the preceding species and displaying a similar range of colour and wing pattern.

♂. Genitalia (Text-figs. 28, 29). Cucullus almost circular and extending beyond ventral margin of valve ; ventral margin of valve smooth and without process from sacculus ; broad-based, curved and tapered process at mid-valve ; vesica with one tapered cornutus, one-half as long as aedeagus.

♀. Genitalia (Text-fig. 30). Lamella postvaginalis produced and rounded medio-posteriorly ; lamella antevaginalis crenulate at each side ; colliculum slenderly produced at each side posteriorly, tapered anteriorly ; anterior third of bursa copulatrix membranous, remainder ribbed and very weakly sclerotized.

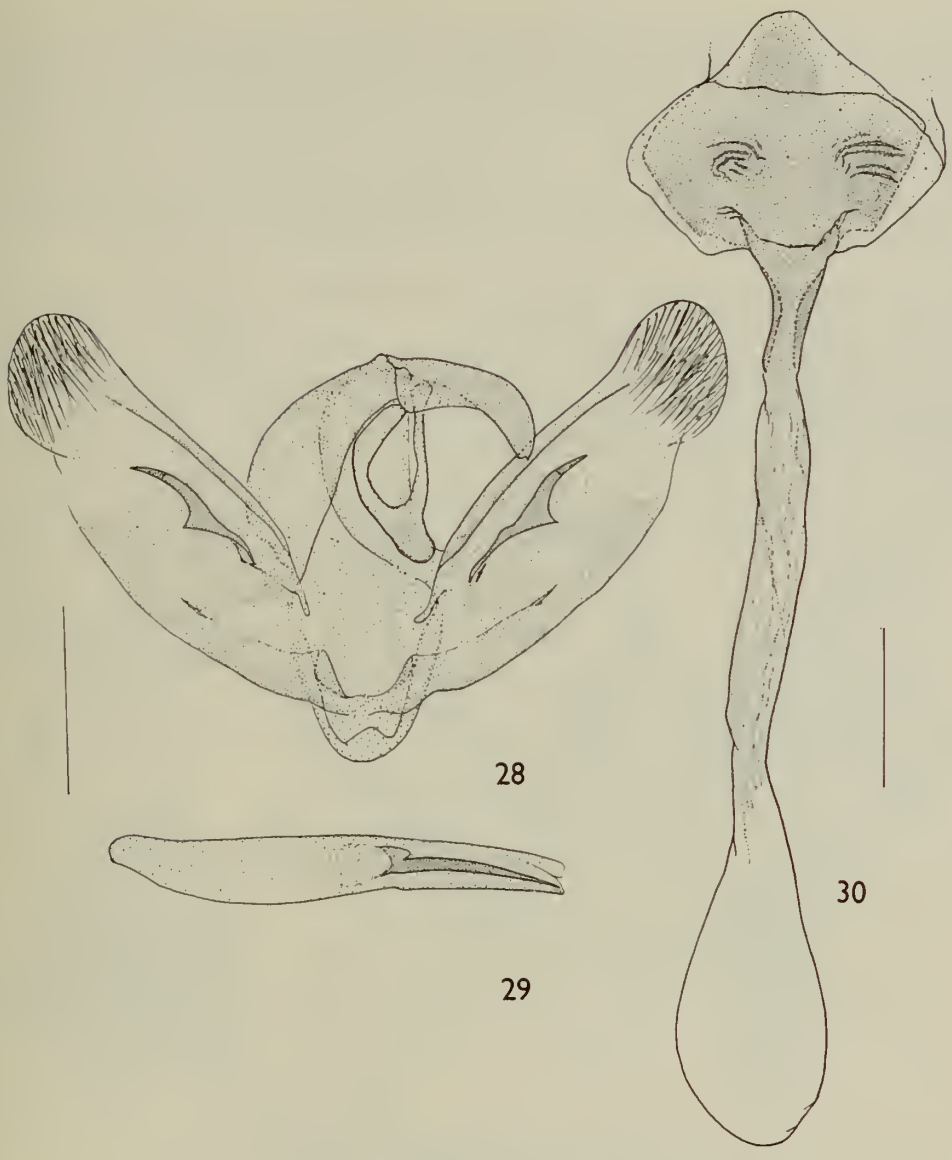
Measurements. ♂ 37–43 mm. ; ♀ 39–43 mm.

Closely related to the preceding species, *tamsi*, from which it may be distinguished structurally ; in the male genitalia by the smooth ventral margin of the valve and the absence of a process from the sacculus, by the broader-based and more slender process at mid-valve and by the loss of the second, shorter cornutus on the vesica ; in the female by the crenulate pattern of the lamella antevaginalis and the long posteriorly produced and anteriorly tapered colliculum.

Distribution (Map 9). São Thomé I. ; probably endemic.

Material examined. Holotype ♂. São Thomé : Bombaim, Traz-os-Montes (450 m.), 6–8.vi.1956, in Muséum national d'Histoire naturelle, Paris.

St. Thomé, x–xi.1899 (*Mocquerys*), 8 ♂, 10 ♀ ; São Thomé, 10–24.i.1926, edge of virgin forest (*T. A. Barns*), 20 ♂, 11 ♀.



FIGS. 28–30. *C. viettei* genitalia. 28, ♂ ; 29, aedeagus ; 30, ♀.

Cleora oculata sp. n.

(Text-figs. 31–33 ; Pl. 4, figs. 203–206 ; Map 2)

♂. Vestiture white, very lightly irrorate with cinnamon brown, patagia edged with cinnamon brown. Wings white ; postmedial fascia on each wing slender and bister, edged distally with a fascia of cinnamon brown, and marked on veins with ochraceous buff ; area distad of postmedial fascia irregularly irrorate with cinnamon brown ; proximad of medial area, fore wing cinnamon brown with a broad, sub-basal fascia heavily marked and irrorate with ochraceous buff ; medial

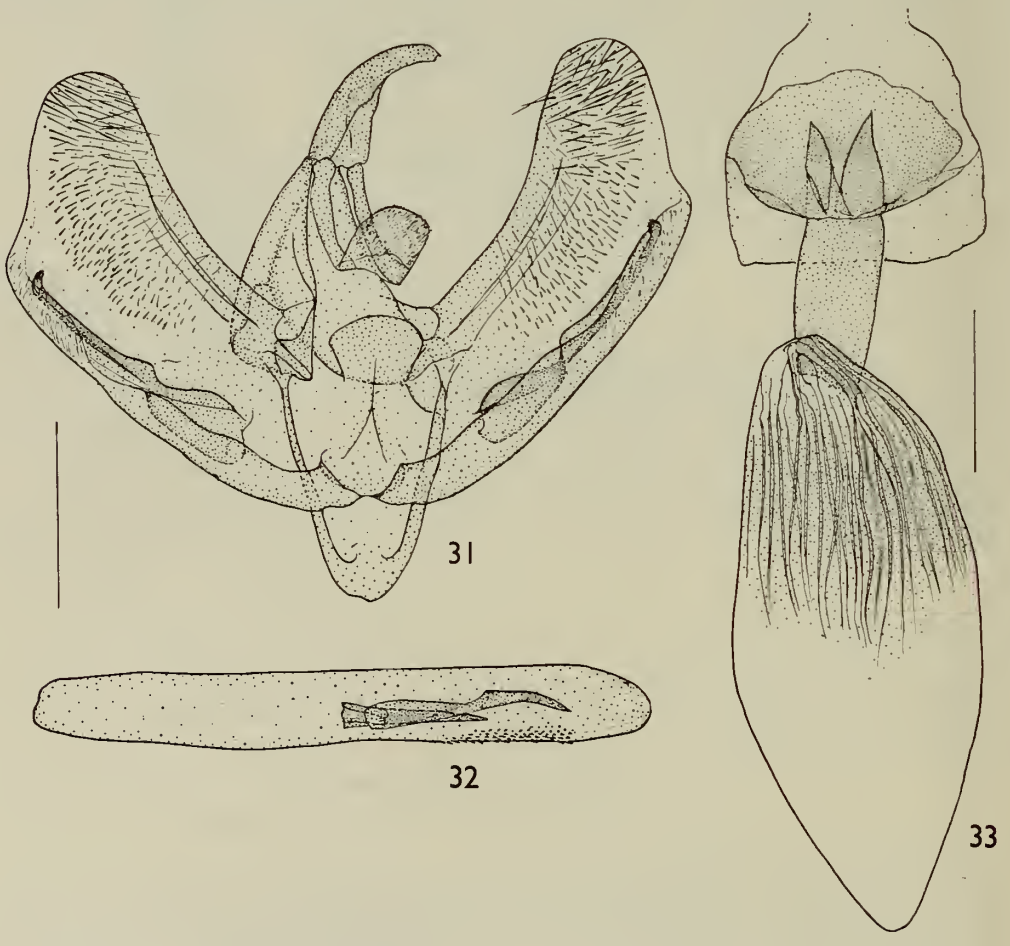
area of fore wing and area proximad of postmedial fascia on hind wing very sparsely irrorate with cinnamon brown ; in a few examples medial fascia weakly marked posterior of discal spots, which are smoke grey broadly ringed with cinnamon brown (Pl. 4, fig. 203). Underside. Costa of fore wing light buff, striate with bister ; remainder of wings white, patterned as illustrated with bister (Pl. 4, fig. 204).

♂. Genitalia (Text-figs. 31, 32). Valve rhomboid ; arm of sacculus nine-tenths as long as dorsal margin of valve and straight to incurved and densely spined apex ; apical half of arm partly covered by a setose, membranous fold ; apical third of aedeagus scobinate along left half of dorsal surface ; vesica with two short cornuti, one-fourth as long as aedeagus, one rather longer.

♀. Similar to male externally, but white area of upperside of both wings more densely irrorate with cinnamon buff (Pl. 4, figs. 205, 206).

♀. Genitalia (Text-fig. 33). Lamella antevaginalis with deep V-shaped incision medially ; ductus bursae lightly sclerotized, twice as long as broad ; colliculum not developed ; bursa copulatrix ovate, anterior half membranous, posterior half sclerotized and ribbed.

Measurements. ♂ 38–44 mm. ; ♀ 40 mm.



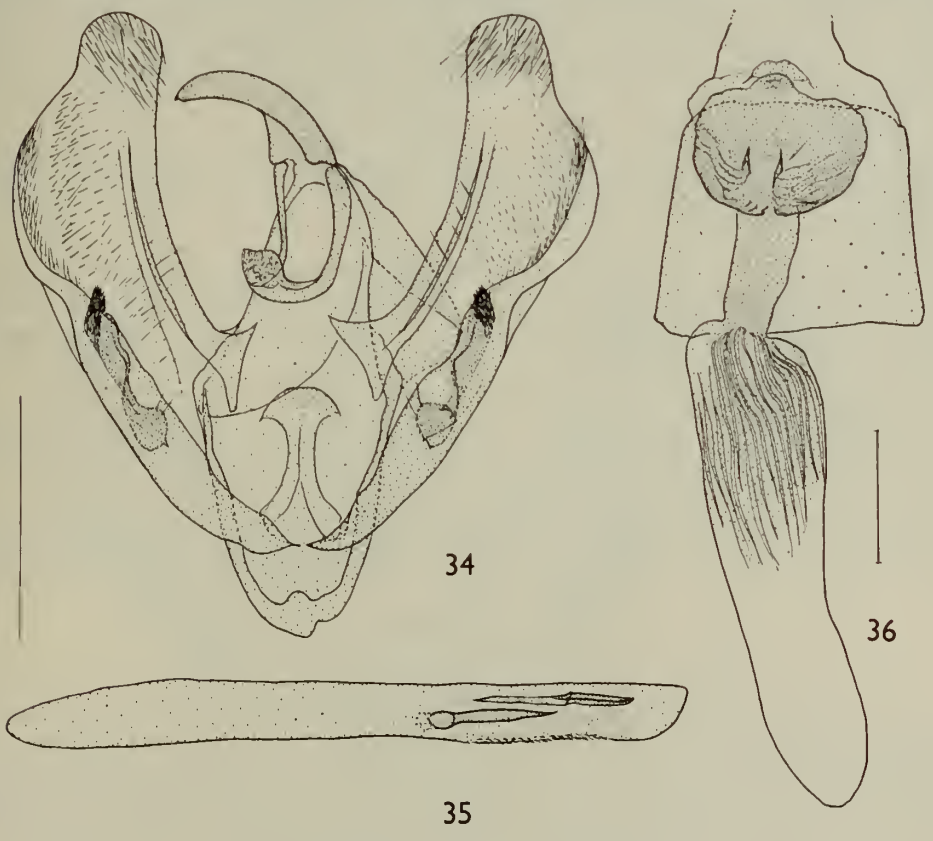
Figs. 31–33. *C. oculata* genitalia. 31, ♂ ; 32, aedeagus (dorsal view) ; 33, ♀.

The structure of the sacculus and the covering of the apical half in a membranous fold in the male genitalia indicate an affinity between *oculata* and the following species, *prosema* and *anacantha*. Externally the broad sub-basal fascia on the fore wing and the large, diffuse discal spots on both wings and structurally the form of the sacculus and vesica in the male and of the lamella antevaginalis in the female are diagnostic.

Distribution (Map 2). Nigeria ; Cameroun ; Angola ; Congo (Leopoldville) ; Uganda.

Holotype ♂. [CAMEROUN] : Afriq. Occid., Station Kamerun, Johann-Albrechts Höhe, 1896 (*L. Conradt*).

Paratypes : NIGERIA : Lokoja, x.1904, rainy season (*D. Cator*), 1 ♂. [CAMEROUN] : Afriq. Occid., Station Kamerun, Johann-Albrechts Höhe, 1898 (*L. Conradt*), 1 ♀ ; Lolodorf, 1894–1895 (*L. Conradt*), 1 ♂ ; Epulan [Efulen], 1.v.1926 (*G. Schwab*), 1 ♂. ANGOLA : Quicolungo, 120 km. N. of Lucala, iv.1936, 800 m. (*R. Braun*), 1 ♂. [CONGO (Leopoldville)] : Leopoldville, 27.vii.1954, 1 ♂ ; Uele, Paulis, 8.iv.1956, 2 ♂ ; ibid., 5.vi.1956, 1 ♂ ; Sankuru, Djeka, 17–18.xii.1952,



FIGS. 34–36. *C. prosema* genitalia. 34, ♂ ; 35, aedeagus (dorsal view) ; 36, ♀.

2 ♂ ; Dimbelenge, 24.x.1950, 1 ♂ ; Lusambo, 29.viii.1949, 1 ♂ ; ibid., 23.vii–28.ix.1950, 3 ♂, 3 ♀ ; Katako-Kombe, 9.xi.1951, 1 ♂, all collected by *Dr. M. Fontaine* and deposited in Musée Royal de l'Afrique Centrale ; W. Kivu, Upper Lowa Valley, Nr. Masisi, 5000–6000 ft., forest and long grass, ii.1924, wet season (*T. A. Barns*), 3 ♂. Uganda : Entebbe, 25.viii.1961, light trap (*K. W. Brown*), 4 ♂.

Cleora prosema Prout

(Text-figs. 34–36 ; Pl. 4, figs. 207, 208 ; Map 2)

Cleora prosema Prout, 1927 : 194, pl. 20 : 11.
Neocleora prosema (Prout) Herbulot, 1958 : 103.

♂. Vestiture and wings white, very sparsely irrorate with bister. Fore wing : transverse fasciae bister, heavily marked at costa, slender and broken elsewhere ; antemedial fascia double and marked heavily also at inner margin. Hind wing : medial and double postmedial fasciae slender and bister. Discal spots on both wings very slenderly outlined in bister (Pl. 4, fig. 207). Underside of wings white, patterned as illustrated with fuscous (Pl. 4, fig. 208).

♂. Genitalia (Text-figs. 34, 35). Valve rhomboid. Arm of sacculus three-fifths as long as dorsal margin of valve, stout and straight and covered by a membranous fold from ventral margin ; apex of arm incurved and densely spined, base with small, rounded, setose process ; apical third of aedeagus scobinate along left half of dorsal surface ; vesica with three tapered cornuti, two closely depressed, the third distinctly separate, each one-seventh as long as aedeagus.

♀. Similar to male externally.

♀. Genitalia (Text-fig. 36). Lamella antevaginalis with two slender, tapered ridges medially ; ductus bursae sclerotized, more heavily anteriorly ; anterior half of bursa copulatrix membranous, remainder ribbed and lightly sclerotized.

Measurements. ♂ 35–40 mm. ; ♀ 39 mm.

Differs externally from the closely related *oculata* in the white, weakly patterned wings ; differs structurally in the male in the shorter arm of the sacculus and the relatively shorter cornuti on the vesica and in the female in the shape of the lamella antevaginalis.

Distribution (Map 2). São Thomé I. ; endemic.

Material examined. Holotype ♂. São Thomé, 10–24.i.1926, edge of virgin forest (*T. A. Barns*), Geometridae genitalia slide No. 2125.

São Thomé : data as type, 2 ♂, 1 ♀ ; São Thomé, 24.i–25.ii.1926 (*T. A. Barns*), 2 ♂ ; ibid., ix–x.1926, 1 ♂ ; São Thomé I., 30.x–24.xi.1932 (*W. H. T. Tams*), 10 ♂.

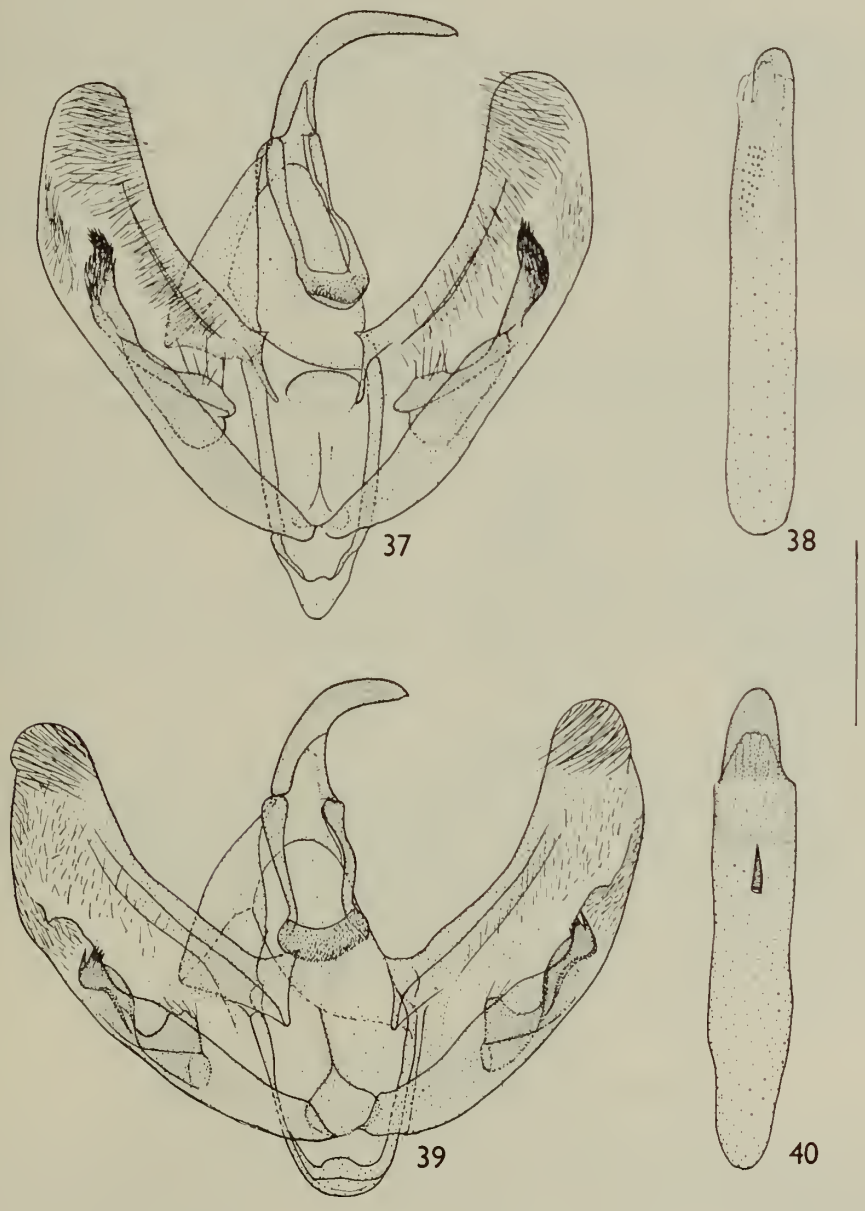
Cleora anacantha sp. n.

(Text-figs. 37–38; Pl. 4, figs. 209–210; Map 2)

♂. Vestiture tilleul buff, patagia tipped with and abdomen lightly irrorate with bister. Wings white ; area distad of slender, bister postmedial fascia of each wing irrorate with cinnamon brown to bister, very sparsely on fore wing, densely on hind wing ; cinnamon brown fascia, marked with ochraceous buff on veins, distad of and parallel with postmedial fascia on each wing ; proximad of antemedial fascia, fore wing densely irrorate with bister and marked on veins with ochraceous buff ; basal area of hind wing irrorate with bister ; antemedial fascia

on fore wing and medial fascia on each wing bister (Pl. 4, fig. 209). Underside of wings tilleul buff, weakly suffused with drab (Pl. 4, fig. 210).

♂. Genitalia (Text-figs. 37, 38). Ventral margin of valve evenly curved to rounded apex ; arm of sacculus short and stout, three-fourths as long as dorsal margin of valve, apex incurved



FIGS. 37–40. *Cleora* ♂ genitalia. 37–38, *anacantha*. 37, ♂ ; 38, aedeagus (ventral view) ; 39–40 *epiclithra*. 39, ♂ ; 40, aedeagus.

and densely spined ; membranous fold slight ; apical third of aedeagus scobinate along left half of dorsal surface ; no cornutus.

♀. Not known.

Measurement. ♂ 39 mm.

The structure of the sacculus and the scobinate aedeagus relate *anacantha* closely to the preceding two species *oculata* and *prosema*. The shape of the valve and the sacculus, the reduction of the membranous fold and absence of cornuti are diagnostic.

Distribution (Map 2). Congo (Leopoldville).

Holotype ♂. [Congo (Leopoldville)] : Sankuru, Lusambo, 9.viii.1950.

Paratypes : [Congo (Leopoldville)] : Lusambo, 15.vi.1949, 1 ♂ ; Uele, Paulis, 1.v.1956, 1 ♂ ; all collected by *Dr. M. Fontaine*, all in Musée Royal de l'Afrique Centrale.

Cleora epiclithra sp. n.

(Text-figs. 39, 40 ; Pl. 5, figs. 211, 212 ; Map 2)

♂. Vertex and first abdominal segment tilleul buff, thorax tilleul buff, irrorate with drab ; remainder of abdomen snuff brown, irrorate with bister (?discoloured). Upper surface of wings tilleul buff, suffused with pinkish buff, strongly proximad of sub-basal fascia and along costa on fore wing and distad of postmedial fascia on each wing and irrorate with black ; sub-basal fascia broad, straight-margined and black ; remaining pattern black, as illustrated (Pl. 5, fig. 211). Under surface of wings tilleul buff, very weakly patterned with fuscous, as illustrated (Pl. 5, fig. 212).

♂. Genitalia (Text-figs. 39, 40). Sacculus three-fifths as long as dorsal margin of valve ; a setose, digitate process at base ; apical half slightly sinuous, the tip bearing a cluster of spines ; apex covered by a setose membranous fold from ventral margin of valve ; aedeagus smooth, apex narrowly rounded ; vesica with a short tapered cornutus, subequal in length to width of aedeagus.

♀. Not known.

Measurement. ♂ 40 mm.

Externally somewhat similar to *oculata* and to some forms of *herbuloti* but differing in the uniformly pinkish buff basal area of the fore wing, the straight-margined sub-basal fascia and the black colour of the irroration and pattern. Structurally closely akin to *anacantha*, but differing in the much shorter sacculus, the smooth aedeagus and the presence of a short cornutus.

Distribution (Map 2). N.E. Congo (Leopoldville).

Holotype ♂. [Congo (Leopoldville)] : Kibali-Ituri, Nioka, 31.viii.1954 (*J. Hecq*), in Musée Royal de l'Afrique Centrale.

Cleora carcassoni sp. n.

(Text-figs. 41, 42 ; Pl. 5, figs. 213, 214 ; Map 2)

♂. Vestiture white, irrorate with drab and bister ; patagia edged with bister. Wings white, irregularly and densely suffused with bister, as illustrated ; posterior distal fourth of fore wing suffused with warm buff in paratype ; cilia on anal margin of hind wing tilleul buff in type, warm buff shading to drab tornad in paratype (Pl. 5, fig. 213). Underside of both wings white, irregularly blotched with fuscous ; margins, except inner margin of fore wing, light buff (Pl. 5, fig. 214).

♂. Genitalia (Text-figs. 41, 42). Arm of sacculus of almost even width, slightly spiral, one surface scobinate in apical half, apex spatulate ; process extends parallel with folded ventral margin of valve, almost to its apex ; apex of aedeagus narrowly rounded, apical third scobinate at one side ventrally ; no cornutus.

♀. Not known.

Measurement. ♂ 40–41 mm.

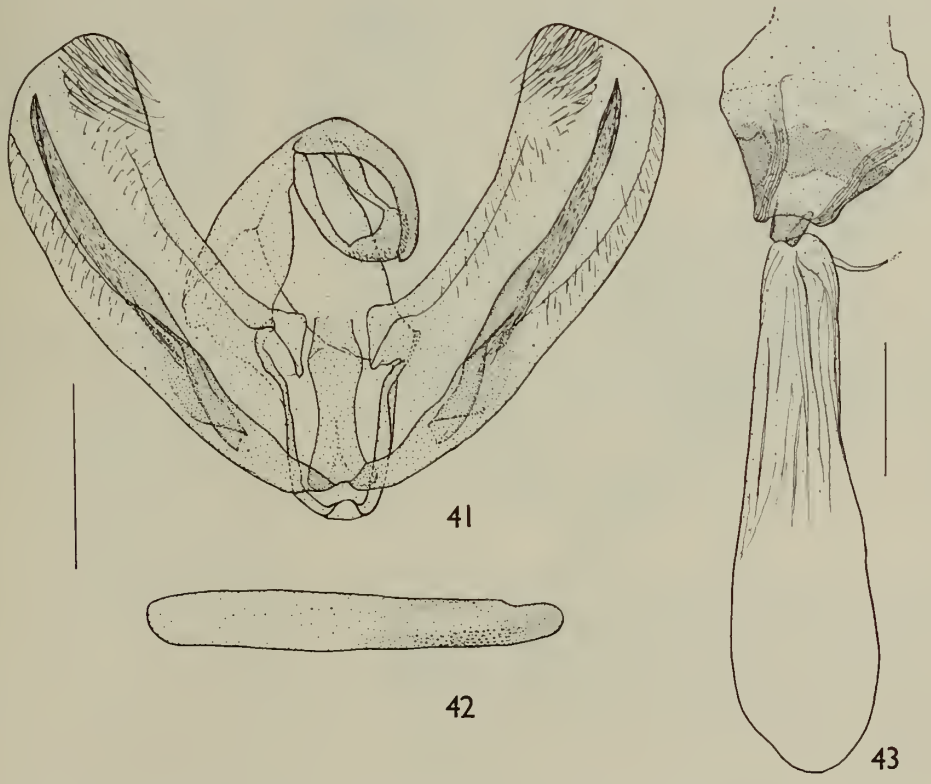
The partially scobinate process arising from the sacculus, the scobinate apical part of the aedeagus and the absence of cornuti appear to relate *carcassoni* closely to *anacantha*. Strikingly distinct in colour and pattern ; structurally the shape of the process arising from the sacculus is diagnostic.

It is with pleasure that I name this species after Mr. R. H. Carcasson of the Coryndon Museum.

Distribution (Map 2). W. Kenya ; S.W. Uganda.

Holotype ♂. KENYA : Kakamega, ix.1961 (*N. Mitton*), genitalia slide Geometridae No. 5292.

Paratype : UGANDA : Ankole, Kalinzu Forest, xi.1961 (*R. H. Carcasson*), 1 ♂ in Coryndon Museum.



FIGS. 41–43. *Cleora* genitalia. 41–42, *carcassoni*. 41, ♂ ; 42, aedeagus. 43, *acerata*, ♀.

Cleora herbuloti (Fletcher) **comb. n.**

(Text-figs. 44–46 ; Pl. 5, figs. 215–222 ; Map 9)

Neocleora herbuloti Fletcher, 1958 : 136, figs. 44, 85, 215.
Neocleora herbuloti Fletcher ; Anon., 1963 : 4.

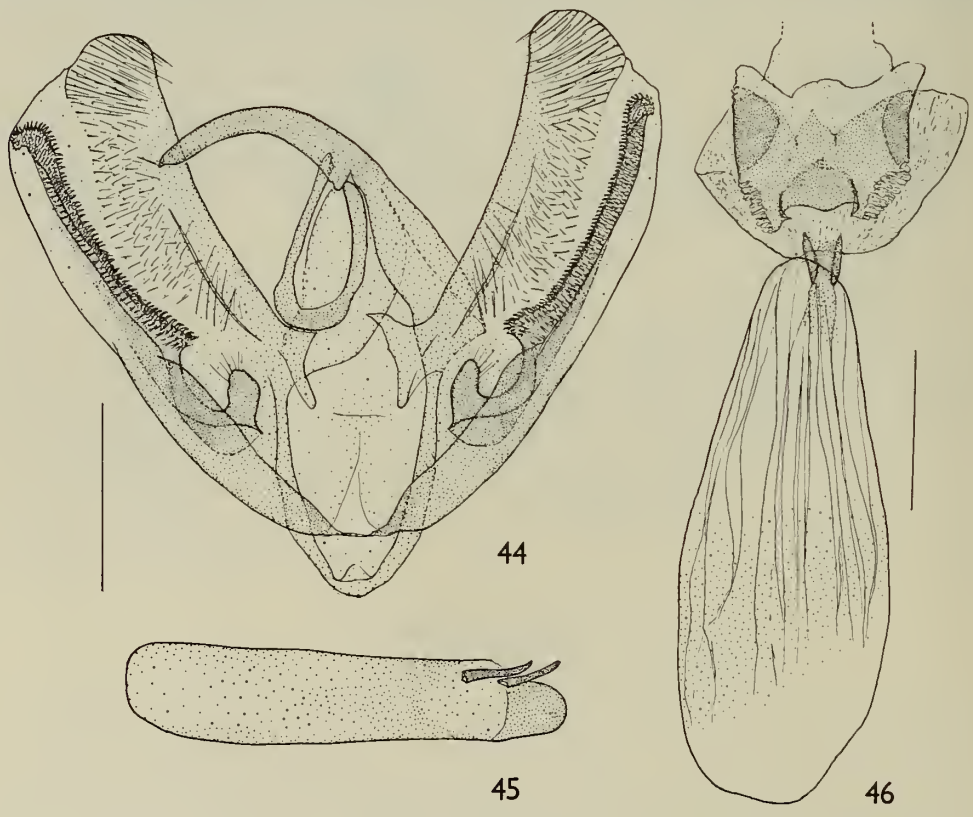
♂♀. External characters of colour and pattern vary geographically and are discussed under respective subspecies.

♂. Genitalia (Text-figs. 44, 45). Arm of sacculus in form of a slender rod, densely spined and rasp-like on its dorsal surface, spiralling ventrad apically, separated by a semi-ovate excavation from a small digitate, setose basal process. Vesica with two cornuti, each subequal in length to width of aedeagus.

♀. Genitalia (Text-fig. 46). Sclerotized part of lamella postvaginalis in form of a horizontal band with a slight projection medio-posteriorly and a strongly sclerotized, raised lobe medio-anteriorly ; colliculum one and one-half times as long as broad. Bursa copulatrix lightly sclerotized in two small areas, one near colliculum, the other anteriorly ; remainder membranous and weakly ribbed.

Two subspecies are described, distinguished by colour and pattern.

Examination of the male genitalia of the limited material available suggests some degree of geographical variation in the shape of the rasp-like arm of the sacculus.



Figs. 44–46. *C. herbuloti* genitalia. 44, ♂ ; 45, aedeagus ; 46, ♀.

In the nominate subspecies, from W. Kivu and W. Uganda, the process is slender and only the apical fifth of the rasp-like surface is turned ventrad. In specimens from Kenya, the arm of the sacculus is shorter and broader and the apical third of the rasp-like surface is turned ventrad ; the genitalia of the single male from Angola are similar. In specimens from Tanzania, Malawi and Cape Province the arm of the sacculus is slender and the rasp-like surface is turned ventrad for almost the whole length. In the single male from Mt. Cameroon the arm of the sacculus is intermediate in form between that of the nominate subspecies and that of the Angolan male and the vesica bears three cornuti. There is also some degree of variation in the stoutness of the aedeagus and of the cornuti ; in examples from Kenya, Angola, Malawi and Cape Province the aedeagus is scobinate apicad on the dorsal surface. Until adequate series are available all material, with the exception of the series of subsp. *phaea*, has been listed under the nominate subspecies.

The well developed arm of the sacculus has a setose digitate basal process similar to that found in *acaciaria*, *prosema* and *epiclithra*. Externally the colour and pattern and structurally the partially scobinate apical area of the aedeagus in some examples and the short cornuti on the vesica are closely similar to *oculata ;* the female genitalia, however, lack the strongly developed ductus bursae of that species.

The excurvation of the arm of the sacculus, between the digitate basal process and the rasp-like apical part in the male genitalia and the form of the sclerotization of the lamella postvaginalis in the female genitalia are specifically diagnostic.

Distribution (Map 9). Fernando Po ; Angola ; Cameroun ; Nigeria ; Congo (Leopoldville) ; Uganda ; Kenya ; Tanzania ; Malawi; Rhodesia ; Transvaal ; Cape Province.

Cleora herbuloti herbuloti (Fletcher)

(Pl. 5, figs. 215–218 ; Map 9)

♂. Vestiture white, irrorate with cinnamon brown ; abdomen irrorate with fuscous. Wings white, irrorate with cinnamon brown, densely proximad of antemedial fascia and in apical area of fore wing and around discal spot and proximad of postmedial fascia on hind wing ; elsewhere very sparsely ; antemedial fascia on fore wing and postmedial fascia on each wing slender and cinnamon brown (Pl. 5, figs. 216, 217). Underside of wings white, patterned with fuscous (Pl. 5, fig. 218).

♀. Differs from male in the even and denser, darker irroration of the wings with bister and fuscous.

Measurements. ♂ 36–45 mm. ; ♀ 38–45 mm.

In three male examples, one from Ibadan, Nigeria, one from Rwankwi in Kivu Province, Congo (Leopoldville) and one from between Nanyuki and Meru, Kenya, the upperside of the hind wing, proximad of the postmedial fascia, is suffused with cinnamon brown (Pl. 5, fig. 215). In the male from Mt. Mlanje, Malawi and a female from Mt. Selinda, Rhodesia both fore and hind wings are similarly suffused distad of the postmedial fasciae ; the basal and apical areas of the fore wings are fuscous. The second female from Mt. Selinda has the remainder of both wings fuscous black.

The white ground colour of the wings and the contrasting concentration of dark irroration proximad of the antemedial fascia and in the apical area of the fore wing and around the discal spots of both wings in typical males are subspecifically diagnostic.

Distribution (Map 9). Fernando Po ; Angola ; Cameroun ; Nigeria ; Congo (Leopoldville) ; Uganda ; Tanzania ; Malawi ; Rhodesia ; Transvaal ; Cape Province.

Material examined. Holotype ♂. Uganda : Kigezi, 5500 ft., (*G. D. H. Carpenter*), genitalia slide Geometridae No. 735.

Fernando Po : Moka, 28.i–3.ii.1933 (*W. H. T. Tams*), 1 ♀. Nigeria : Near Ibadan, 1 ♂. Mt. Cameroon : Musake, 6350 ft., 8.i.1932 (*M. Steele*), 1 ♂. Angola: Quicolungo, 120 km. N. of Lucala, 800 m., iv.1936 (*R. Braun*), 1 ♂. Congo (Leopoldville) : W. Kivu, Upper Lowa River, nr. Masisi, 5000–6000 ft., ii.1924 (*T. A. Barns*), 1 ♂, all in British Museum (Natural History) ; Kivu, Rwankwi, 15.viii.1947 (*J. V. Leroy*), 1 ♂ ; ibid., 13.xi.1947, 1 ♂ ; ibid., iv.1948, 1 ♂, 1 ♀ ; Mulungu (Tshibinda), 31.i.1956 (*J. Hecq*), 1 ♂ ; Mongbwalu (Kilo), 1937 (*Me. Harford-Jordens*), 1 ♂ ; Sankuru, Djeka, 17.xii.1952 (*Dr. Fontaine*), 1 ♂ ; Katako-Kombe, 2.i.1952 (*Dr. Fontaine*), 1 ♂ ; Kibali-Ituri, Kilo (Mines), 1955 (*R. Andry*), 1 ♂, all in Musée Royal de l'Afrique Centrale. Burundi : Astrida, c. 400 m., 6.vii.1961 (*Dr. Fontaine*), 1 ♂ in Musée Royal de l'Afrique Centrale. Uganda : Ankole, Kalinzu Forest, xi.1961 (*R. H. Carcasson*), 1 ♂ ; Mabira Forest, Jinja, x.1962 (*R. H. Carcasson*), 2 ♀, all in Coryndon Museum ; Bundibugyo, 3440 ft., 22.viii–3.ix.1952 (*D. S. Fletcher*), 1 ♂ ; Entebbe, 25.viii.1961 (*W. K. Brown*), 3 ♂. Kenya : Mt. Kenya, vii.1930 (*E. Barns*), 1 ♂ ; Nanyuki-Meru, 6.vii.1930 (*E. Barns*), 2 ♂. Tanzania : Amani, iii–iv.1936 (*Cooper*), 2 ♂. Malawi : Mt. Mlanje, 25.iv.1913 (*Neave*), 1 ♂. Rhodesia : Mt. Selinda, 8–9.iii.1954 (*H. Cookson*), 1 ♀ and ibid., 9–17.iv.1956 (*Van Son & Vari*), 1 ♀, both in Transvaal Museum. Transvaal : Kowyn's Pass, Pilgrim's Rest Distr., 22.i.1962 (*Vari & Leleup*), 1 ♂ in Transvaal Museum. Cape Province : Transkei, Katberg, 1949 (*H. B. D. Kettlewell*), 1 ♂.

Cleora herbuloti phaea ssp. n.

(Pl. 5, figs. 219–222 ; Map 9)

♂. Ground colour of wings vinaceous buff, white only at termen between veins M_3 and Cu_1 on each wing, irrorate and patterned with fuscous black as illustrated ; veins ochraceous buff (Pl. 5, fig. 219). Underside pattern similar to that of nominate subspecies, but marked in iron grey, postmedial fascia sharply defined on anterior half of each wing ; dark markings of upperside show through, giving wings a smoky appearance (Pl. 5, fig. 220).

♀. Similar to male, but pattern largely obscured by dense fuscous black irroration (Pl. 5, figs. 221, 222).

Measurements. ♂ 38–41 mm. ; ♀ 38–46 mm.

Biology. Larvae have been reported (Anon, 1963 : 4) from the Louis Trichardt area of the Northern Transvaal completely defoliating or severely damaging foliage

of *Pinus patula, Eucalyptus cloesiana* and *E. grandis* (*saligna*) in March and November.

Distribution (Map 9). Transvaal, Louis Trichardt.

Holotype ♂. South Africa : Entabeni, nr. Louis Trichardt, ex pupa 3.viii.1962, Div. of Entomology, S. Africa ; genitalia slide Geometridae No. 5242.

Paratypes : Entabeni, nr. Louis Trichardt, 30.iii.1962, 1 ♂ ; data as holotype 1 ♂, 3 ♀.

Cleora acerata sp. n.

(Text-fig. 43 ; Pl. 5, figs. 223, 224 ; Map 9)

♂. Vestiture vinaceous buff, densely irrorate with fuscous black ; crest of first abdominal tergite white. Fore wing vinaceous buff, densely irrorate and patterned with fuscous black ; sub-basal and antemedial fasciae fused in some examples to form band ; veins ochraceous buff, colour sometimes suffusing posterior half of wing. Hind wing white anteriorly, vinaceous buff posteriorly, densely irrorate and patterned with fuscous black ; medial and postmedial fasciae sometimes fused posterior of discal spot (Pl. 5, fig. 223). Underside white ; fuscous black pattern of upper side marked in iron grey, but ill-defined (Pl. 5, fig. 224).

♂. Genitalia. Arm of sacculus similar to that of preceding species, rasp-like, straight and parallel with margin of valve, but separated from short, basal, digitate process by semicircular excavation ; aedeagus not scobinate at apex ; no cornutus.

♀. Similar to male externally.

♀. Genitalia (Text-fig. 43). Sclerotized lamella postvaginalis in form of an irregular transverse band of almost even width ; colliculum weakly sclerotized, length equal to width ; bursa copulatrix membranous, weakly ribbed posteriorly.

Measurements. ♂ 39–44 mm. ; ♀ 42–44 mm.

Closely related to the preceding species and externally similar to the darker forms of *herbuloti phaea ;* distinguished structurally in the male by the shape of the excavation in the sacculus and the absence of cornuti ; distinguished in the female by the sclerotized pattern of the lamella postvaginalis and the shorter, weaker colliculum.

Distribution (Map 9). Mt. Cameroon.

Holotype ♂. Mt. Cameroon : Mann's Quelle, 7400 ft., 29.i.1932 (*M. Steele*), genitalia slide Geometridae No. 5239.

Paratypes : Mt. Cameroon : Musake, 6350 ft., 8.i.1932 (*M. Steele*), 2 ♂, 1 ♀ : ibid., 13.i.1932, 1 ♀ ; data as holotype, 2 ♂, 1 ♀ ; ibid., 2.ii.1932, 1 ♀.

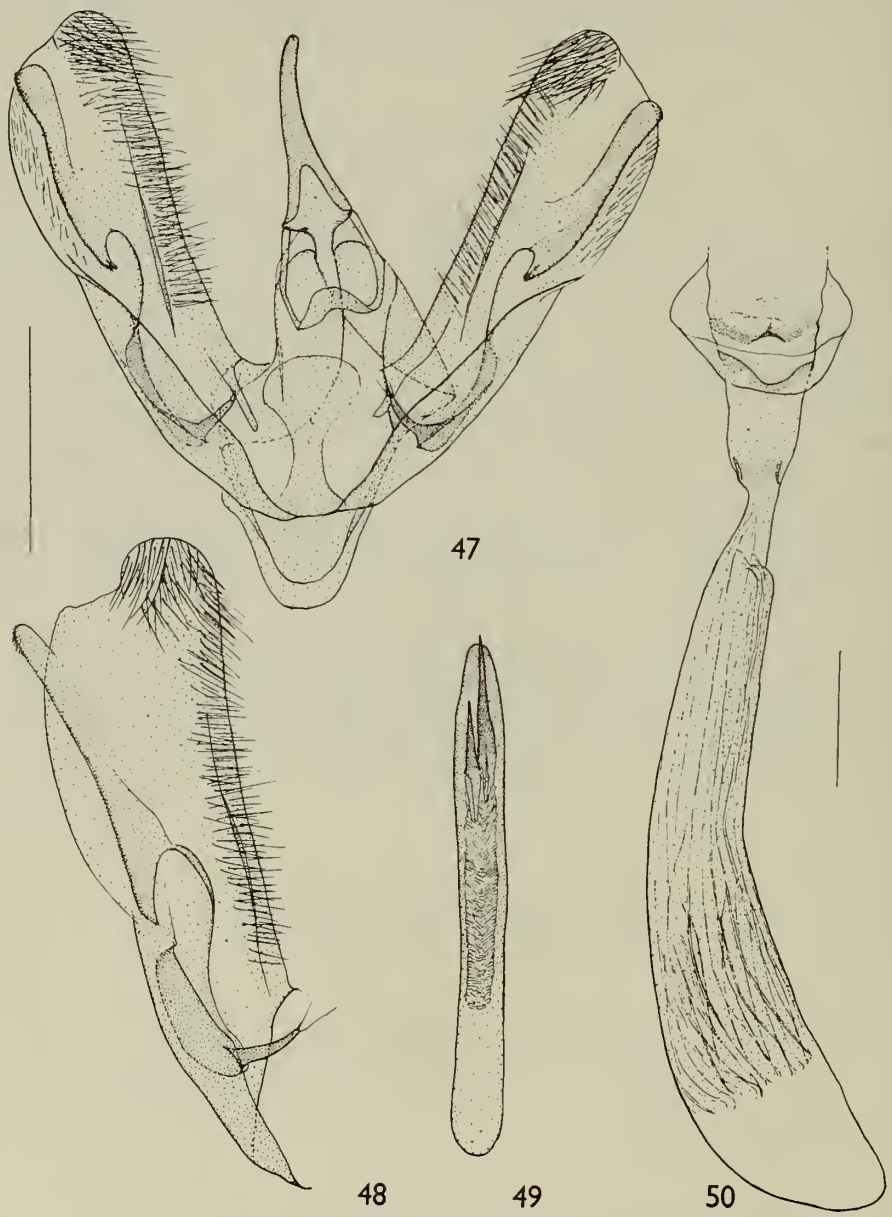
Cleora subcincta (Warren)

(Text-figs. 47–50 ; Pl. 6, figs. 231–241, 245 ; Map 9)

Chogada subcincta Warren, 1901 : 16.
Cleora subcincta (Warren) Prout, 1927 : 194.
Neocleora subcincta (Warren) Herbulot, 1958 : 103.

♂ ♀. An obscurely marked species varying geographically in size and in colour of underside of wings ; these characters are discussed under respective subspecies.

♂. Genitalia (Text-figs. 47–49). Uncus long, slender and tapered ; valve broadened apicad ; arm of sacculus slender and spatulate, partly fused with dorsal margin of valve, ventral margin serrate and parallel with ventral margin of valve ; long, very slender, setose, digitate process at base of sacculus ; vesica with two slender, tapered cornuti, one one-third and one one-fourth as long as aedeagus.



Figs. 47–50. *Cleora* genitalia. 47, *subcincta subcincta*, ♂. 48–50, *subcincta longifibulata*. 48, ♂, left valve ; 49, aedeagus ; 50, ♀.

♀. Genitalia (Text-fig. 50). Lamella postvaginalis weakly sclerotized with shallow, tapered process medio-posteriorly ; lamella antevaginalis weakly sclerotized at posterior margin ; colliculum weak and short ; anterior fourth of bursa copulatrix membranous, remainder weakly sclerotized and ribbed.

Two subspecies are described, characterized by the colour of the underside of the wings and by the modification of the male genitalia.

The precise relationship of *subcincta* is obscure, but the serrate-edged process on the valve and the digitate process on the sacculus suggest an affinity with *herbuloti*. The form of these structures, together with the shape of the sterigma in the female genitalia, afford diagnostic specific characters.

Distribution (Map 9). São Thomé I. ; Angola ; Cameroun ; Congo (Leopoldville) ; Uganda ; Kenya ; Tanzania.

Cleora subcincta subcincta (Warren)

(Text-fig. 47 ; Pl. 6, figs. 231–233, 236–238 ; Map 9)

♂. Underside of wings white, suffused with fuscous, except at apex of fore wing ; discal spots and discal third of each wing more densely suffused than remainder (Pl. 6, figs. 236–238).

♂. Genitalia (Text-fig. 47). Serrate-edged process on sacculus one and one-half times as long as greatest width of valve.

♀. Proximal two-thirds of underside of each wing less densely suffused than in male ; white ground colour discernible at apex and mid-termen of each wing (Pl. 6, fig. 237).

Measurements. ♂ ♀ 33–34 mm.

Distribution (Map 9). São Thomé ; endemic.

Material examined. LECTOTYPE ♀. St. Thomé, x–xi.1899 (*Mocquerys*), labelled by the author : *Chogada subcincta* Warr., type ♀, by present designation.

Paralectotypes : St. Thomé, x–xi.1899 (*Mocquerys*), 4 ♀.

St. Thomé, xii.1899–i.1901 (*Mocquerys*), 2 ♂, 6 ♀ ; São Thomé, 10.i–24.ii.1926, edge of virgin forest (*T. A. Barns*), 5 ♂, 5 ♀.

Cleora subcincta longifibulata (Fletcher) **comb. n.**

(Text-figs. 48–50 ; Pl. 6, figs. 234, 235, 239–241, 245 ; Map 9)

Neocleora subcincta longifibulata Fletcher, 1958 : 137, fig. 84.

♂ ♀. Underside of wings in both sexes suffused as in the nominate subspecies, but ground colour light to warm buff (Pl. 6, figs. 239, 240, 245).

♂. Genitalia (Text-figs. 48, 49). Serrate-edged process on valve longer than in nominate subspecies, being almost twice as long as greatest width of valve.

Measurements. ♂ 32–38 mm. ; ♀ 34 mm.

Distribution (Map 9). Angola ; Cameroun ; Congo (Leopoldville) ; Uganda ; Kenya ; Tanzania.

Material examined. Holotype ♂. Uganda : Bundibugyo, 3440 ft., 22.viii–3.ix.1952 (*D. S. Fletcher*), genitalia slide Geometridae No. 1755.

CAMEROUN : Johann-Albrechts Höhe, 1896 (*L. Conradt*), 2 ♂ ; ibid., 1898, 1 ♂. CONGO (Leopoldville) : Upper Uelle distr., v, 1 ♂ ; E. Upper Ituri Valley, 30 miles S. of Irumu, 3000–3500 ft., vii.1924, dense forest (*T. A. Barns*), 1 ♂, all in British Museum (Natural History) ; Boma à Banana, 1933 (*Dr. Van Hoof*), 1 ♂ ; Uele, Paulis, 14.ii.1956 (*Dr. M. Fontaine*), 1 ♂ ; ibid., 6.viii.1956, 1 ♂ ; Mongbwalu (Kilo), 1937 (*Me. Harford-Jordens*), 1 ♂, 1 ♀ ; Kivu, Rwankwi, iii,iv,ix (*J. V. Leroy*), 4 ♂ ; Kivu, Nyamunyunye (Mulungu), 20.xii.1955 (*J. Hecq*), 1 ♀ ; all in Musée Royal de l'Afrique Centrale. UGANDA : Bwamba, v.1958 (*R. Carcasson*), 1 ♀ and Bwamba Terr., ix.1961 (*N. Mitton*), 1 ♂, both in Coryndon Museum ; data as holotype, 1 ♀ and Kigezi, Mafuga forest, 25 miles N.W. Kabale, Rutenga, 7000 ft., 15.vii.1951 (*J. A. Burgess*), 1 ♂, both in British Museum (Natural History) ; Mabira forest, Jinja, x.1962 (*R. H. Carcasson*), 2 ♂ in Coryndon Museum. KENYA : Kakamega, v.1957 (*Mrs. Board*), 1 ♂ in Coryndon Museum. TANZANIA : E. Usambara Mts., Amani, x.1953 (*E. Pinhey*), 3 ♂.

Cleora lacrymata sp. n.

(Text-figs. 51–53 ; Pl. 5, figs. 225, 226 ; Map 3)

♂. Vestiture and wings white, lightly irrorate with bister, apical area of fore wing usually rather more densely irrorate. Antemedial fascia on fore wing and postmedial fasciae on both wings slender and bister ; medial fascia present on hind wing posterior of discal spot, bister, broad and ill-defined ; discal spots on both wings heavily outlined with bister (Pl. 5, fig. 225). Underside of wings white, suffused and patterned with bister as illustrated (Pl. 5, fig. 226).

♂. Genitalia (Text-figs. 51, 52). Medial plate of gnathus scobinate, rather broader than greatest width of cucullus and with two scobinate arms projecting dorsad, one from each side ; ventral margin of valve and of cucullus sparsely spined ; process arising from sacculus tipped with heavily sclerotized spines varying in number, two on left valve and three on right valve in holotype ; in a topotypical paratype the numbers are five and three respectively and the basal, spinose process is enlarged ; vesica with two cornuti, one slender, tapered and tipped with two spines, one-half as long as aedeagus, the other densely scobinate and one-third as long as aedeagus.

♀. Similar to male externally.

♀. Genitalia (Text-fig. 53). Sterigma two-thirds as broad as long and well sclerotized ; lamella postvaginalis with a series of concentric, semicircular ridges medially ; colliculum rather longer than broad ; bursa copulatrix cylindrical, anterior third membranous, remainder ribbed and very weakly sclerotized.

Measurements. ♂ 40–43 mm. ; ♀ 43 mm.

In addition to the variation in the sacculus already mentioned a male from the Central African Republic has thirteen spines on the left side and nine on the right ; a male from Cameroun has a single spine on each side ; a male from Ghana is the converse of the holotype, having two spines on the left side and three on the right. More material might show some correlation between the ornamentation of the sacculus and distribution.

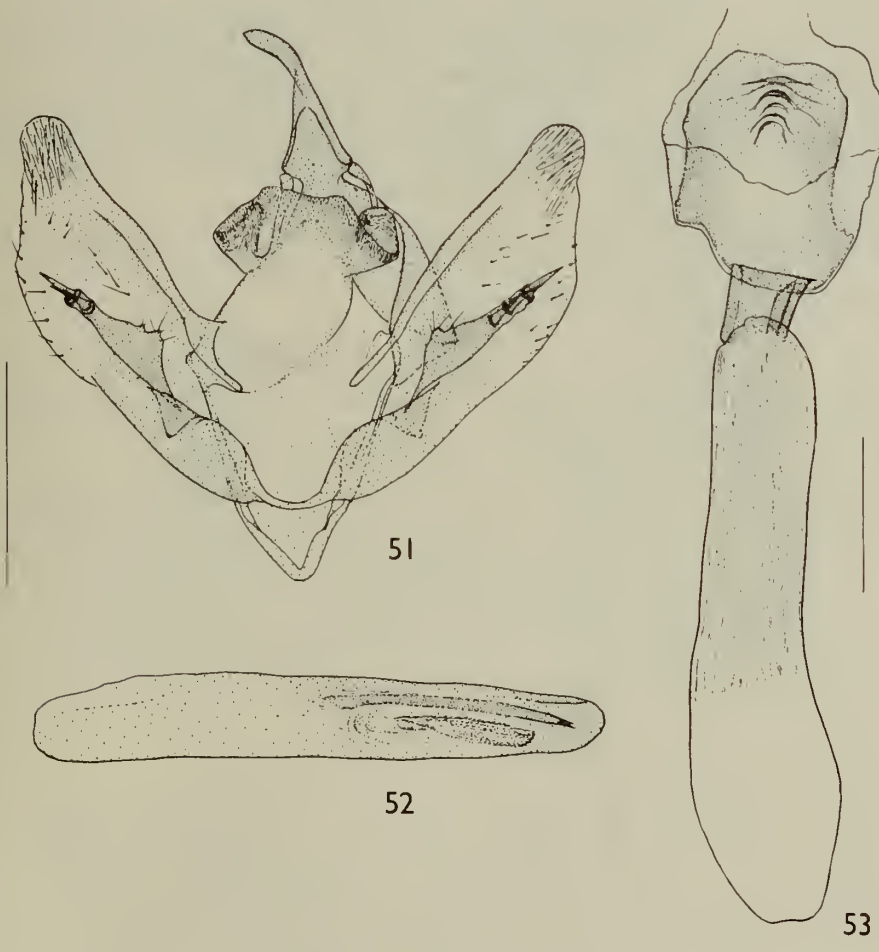
When seen in a series, the clean white ground colour of the wings, the slender, bister pattern and the ill-defined medial fascia extending posteriorly from the heavily marked discal spots, the species appears distinctive. In the male genitalia

the shape of the sacculus, the scobinate arms of the gnathus and the cornuti on the vesica and in the female genitalia the form of the sterigma are diagnostic.

Distribution (Map 3). Ivory Coast ; Ghana ; Nigeria ; Cameroun ; Central African Republic ; Congo (Leopoldville) ; Kenya.

Holotype ♂. Ivory Coast : Bingerville, 1–5.viii.1915 (*G. Melou*), genitalia slide Geometridae No. 5255.

Paratypes : Ivory Coast : Bingerville, 25.v–3.vi.1915 (*G. Melou*), 1 ♂ ; ibid., 11.vi, 1 ♂ ; ibid., 1–14.vii, 2 ♂ ; ibid., 1–5.viii, 1 ♀ ; ibid., 1–3.ix, 1 ♂. [Ghana] Gold Coast : Ashanti, Goaso (*G. N. Gibbs*), 1 ♂. Nigeria : Mamfe, ii.1958, 1 ♂ in National Museum of Rhodesia. [Cameroun] : Afriq. Occid., Station Kamerun, Johann-Albrechts Höhe, 1898 (*L. Conradt*), 1 ♂. Angola : Quicolungo, 120 km. N. of Lucala, 800 m., iv.1936 (*R. Braun*), 1 ♂ ; Fazenda Congulu, Amboim district,



Figs. 51–53. *C. lacrymata* genitalia. 51, ♂ ; 52, aedeagus ; 53, ♀.

7–800 m., 12–16.iv.1934 (*Dr. K. Jordan*), 1 ♂. [Central African Republic] Oubangui : Bangassou, vi–viii.1958 (*P. Labour*), 1 ♂ in coll. C. Herbulot, Paris. [Congo (Leopoldville)] : Uele, Paulis, 12.iv.1956 (*Dr. M. Fontaine*), 1 ♂ in Musée Royal de l'Afrique Centrale. Kenya : Mt. Marsabit, 4500 ft., ii.1946 (*T. H. E. Jackson*), 1 ♀.

Cleora echinodes sp. n.

(Text-figs. 54–56 ; Pl. 6, figs. 242, 246 ; Map 3)

♂. Vestiture white to pinkish buff, irrorate with bister. Fore wing white, varyingly suffused with pinkish buff and irrorate with bister ; transverse fasciae bister, sharply defined. Hind wing similar, but pinkish buff suffusion and bister irroration usually greatly reduced proximad of postmedial fascia ; antemedial fascia wanting, discal spots heavily outlined in bister, but definition diffuse (Pl. 6, fig. 242). Underside of each wing tilleul buff to light buff, varyingly suffused with pinkish buff to bister except at apex and terminally between veins M_3 and Cu_1 (Pl. 6, fig. 246).

♂. Genitalia (Text-figs. 54, 55). Arms of gnathus slender, bearing a scobinate medial plate, incurved medio-ventrally, four-fifths as broad as greatest width of valve ; valve with a coarsely scobinate area, triangular in shape, extending from mid-valve apicad to cucullus and ventrad almost to ventral margin ; process arising from mid-valve almost rhomboid, posterior dorsal corner produced in short, digitate form, slightly asymmetrical, vesica scobinate in apical half and bearing two tapered cornuti fused at base, one one-fifth and one one-fourth as long as aedeagus.

♀. Similar to male externally.

♀. Genitalia (Text-fig. 56). Lamella postvaginalis mitre-shaped ; colliculum twice as long as broad with tapered lateral projections into bursa copulatrix, which is ribbed and weakly sclerotized, except at membranous anterior extremity.

Measurements. ♂ 39–42 mm. ; ♀ 39–40 mm.

Related to the preceding species, having in the male genitalia a similar, but less extensively developed, broad gnathus ; the scobination on the valve, sparse in *lacrymata*, is extensively developed ; the process arising from the sacculus is reduced and unadorned but similar in outline to that of *lacrymata*.

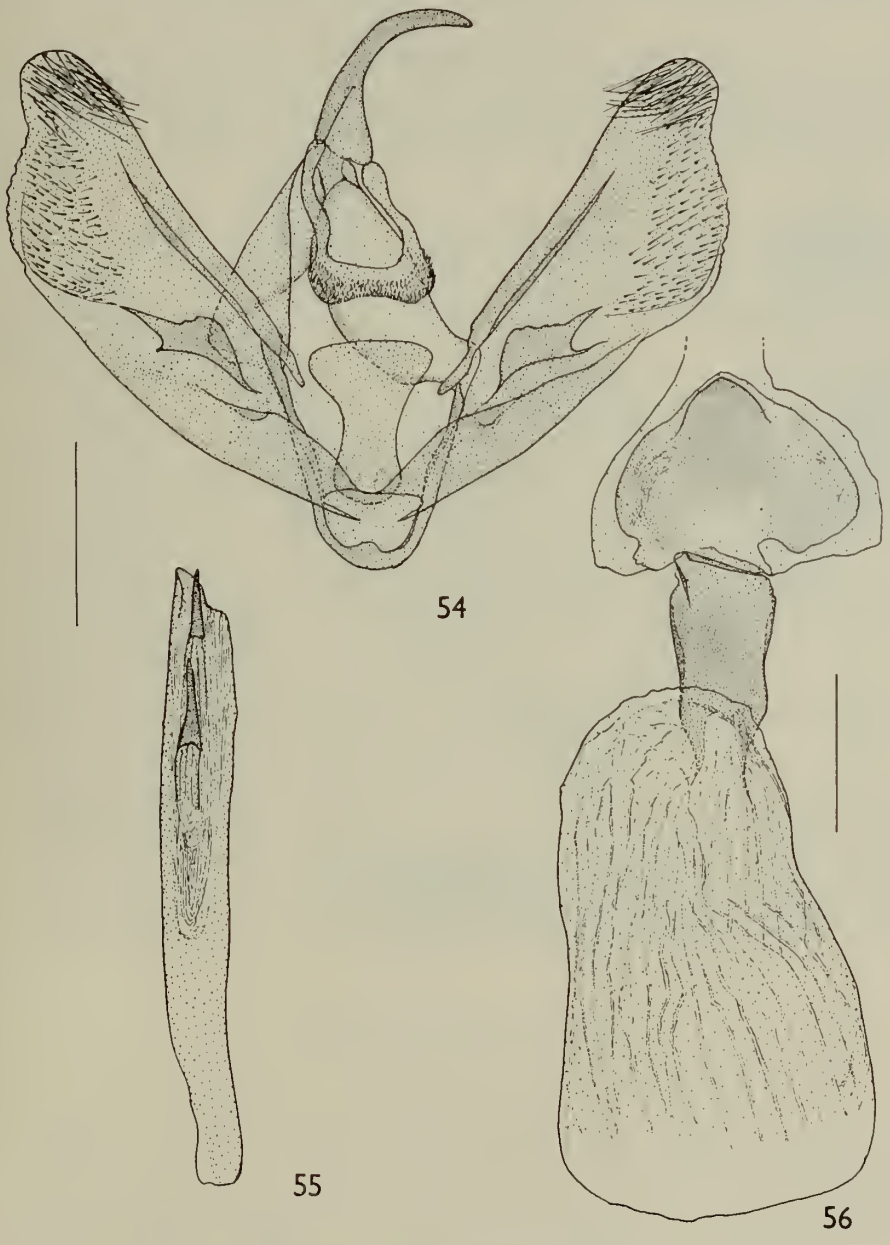
Externally poorly characterized ; seen in a series, the combination of pinkish buff suffusion and bister pattern of the upperside of the wings and the usually dense brown suffusion of the underside is striking, but individual specimens are more surely determined by the genitalia. The broad, scobinate gnathus, the broad triangular, spined cucullus and the process arising from the sacculus in the male and the shape of the sterigma and colliculum in the female are diagnostic.

Distribution (Map 3). Fernando Po ; Cameroun ; Congo (Leopoldville) ; Uganda ; Malawi.

Holotype ♂. Uganda : Entebbe, iii–v.1895 (*Jackson*).

Paratypes : Fernando Po : 650 ft., end of wet season (*Rev. W. Cooper*), 1 ♀. [Cameroun] : Afriq. Occid., Station Kamerun, Johann-Albrechts Höhe, 1896 (*P. Conradt*), 1 ♂. [Congo (Leopoldville)] : Upper Uelle distr., Dungu, v., 2 ♂ ; Yakusu (*K. Smith*), 1 ♂, all in British Museum (Natural History) ; Uele, Paulis, 18.iii.1956 (*Dr. M. Fontaine*), 1 ♂ ; Lusambo, 16.vi.1949 (*Dr. M. Fontaine*), 1 ♂ ; ibid., 11.vii.1950, 1 ♂ ; Sankaru, Katako-Kombe, 11.ix.1952, 1 ♂ ; Kafakumba, xii.1932

(*F. G. Overlaet*), 1 ♂, all in Musée Royal de l'Afrique Centrale ; W. Kivu, south Lowa Distr., Lowowo Valley, 4000 ft., mountain forest, iii.1924, wet season (*T. A. Barns*), 1 ♂ ; Escarpment west of Semliki Valley, 20 mls. S.W. of Boga, 3500–4000 ft., vii.1924, borders of tropical forest and long grass country (*T. A. Barns*), 2 ♂.



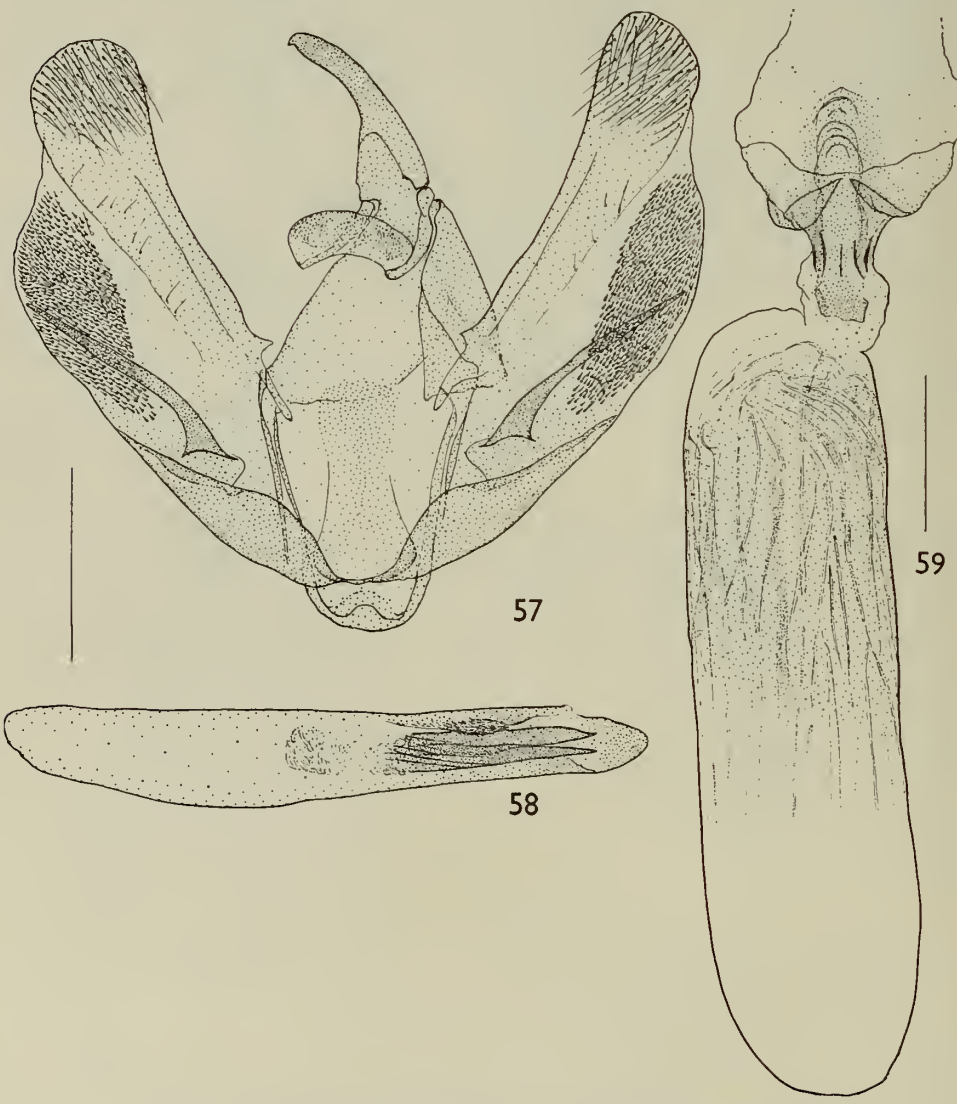
FIGS. 54–56. *C. echinodes* genitalia. 54, ♂ ; 55, aedeagus ; 56, ♀.

Uganda : Bwamba, iv–v.1940 (*T. H. E. Jackson*), 2 ♂ ; ibid., x.1942, 1 ♂ ; Budongo v–vi.1939 (*T. H. E. Jackson*), 1 ♂ ; Budongo (*G. W. Jeffery*), 1 ♂ ; Kampala, 25.vii.1925, 1 ♂. [Malawi] Nyasaland : Mt. Mlanje, 15.ii.1913 (*S. A. Neave*), 1 ♂ ; ibid., 17.iii.1913, 1 ♀.

Cleora raphis sp. n.

(Text-figs. 57–59 ; Pl. 5, figs. 227–230 ; Map 3)

♂. Vestiture white, irrorate with drab and bister, patagia edged dorsally with bister. Fore wing white, densely irrorate with drab ; antemedial fascia ill-defined, postmedial fascia



Figs. 57–59. *C. raphis* genitalia. 57, ♂ ; 58, aedeagus ; 59, ♀.

sharply defined, bister. Hind wing similar, but antemedial fascia wanting ; medial fascia present, bister. Veins on both wings paler, tinged with cartridge buff (Pl. 5, fig. 227). Underside : apex of fore wing and termen of each wing, between veins M_3 and Cu_1, white ; remainder of wings suffused with fuscous, lightly round discal spots, densely elsewhere (Pl. 5, fig. 228).

In a comparatively fresh specimen (date 1955), the drab and bister colours are replaced by smoke grey and iron grey and the cartridge buff veins are more conspicuous ; possibly these colours fade to brown tones with age.

♂. Genitalia (Text-figs. 57, 58). Scobinate medial plate of gnathus as broad as cucullus, which is membranous and dilate at apex, extending slightly beyond ventral margin of valve ; scobinate area on valve medio-ventrally ; arm of sacculus aculeate, two-thirds as long as dorsal margin of valve ; vesica with a short, slender scobinate band equal in length to width of aedeagus and two stout tapered cornuti, one slightly greater than, one slightly less than one-third as long as aedeagus.

♀. (Pl. 5, figs. 229, 230). Similar to male externally.

♀. Genitalia (Text-fig. 59). Lamella postvaginalis narrowly sclerotized medially with concentric ridges ; lamella antevaginalis ribbed and folded ; colliculum one-half as long as broad ; bursa copulatrix cylindrical, posterior extremity and anterior half membranous, remainder moderately sclerotized and ribbed, the ribbing extending weakly into anterior half.

Measurements. ♂ 42–44 mm. ; ♀ 40 mm.

The species has a broad scobinate medial plate to the gnathus, similar to that found in the preceding species *lacrymata* and in *echinodes* and a basically similar sacculus structure ; the scobinate medial area of the ventral margin of the valve differs from that found in *echinodes* in being less coarse and completely separate from the cucullus.

Externally poorly characterized. Structurally the needle-like process arising from the sacculus and the ornamentation of the vesica in the male and the shape of the sterigma in the female are diagnostic.

Distribution (Map 3). Congo (Leopoldville).

Holotype ♂. [Congo (Leopoldville)] : Kassai district (*Taymans*), genitalia slide Geometridae No. 2308 in British Museum (Natural History).

Paratypes : [Congo (Leopoldville)] : Tumbulungu, 8.ix.1930 (*G. F. de Witte*), 1 ♀ ; Coquilhatville, 9.ix.1955 (*Dr. M. Fontaine*), 1 ♂ ; Fl. Congo, Bolombo [3°59″S. 21°24″E.], vii.1938 (*J. Ghesquière*), 1 ♂ ; Uele, Bambesa, 20.ix.1933 (*J. Leroy*), 1 ♀ ; Sankaru, Lusambo, 6.viii.1950 (*Dr. M. Fontaine*), 1 ♂ ; ibid., 8.viii.1950, 1 ♂ ; Bena-Dibele, xi.1921 (*L. Verlaine*), 1 ♂, all in Musée Royal de l'Afrique Centrale.

Cleora aculeata sp. n.

(Text-figs. 60–62 ; Pl. 6, figs. 243, 244, 247, 248 ; Map 3)

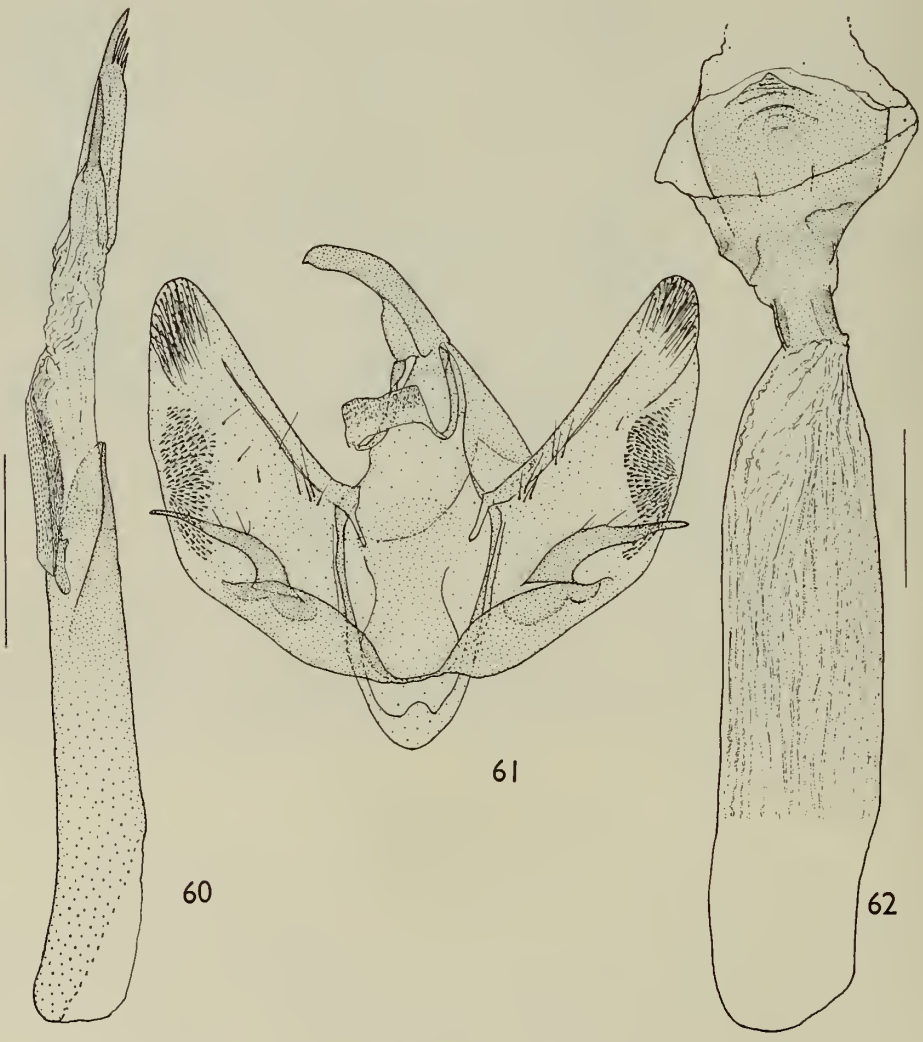
♂. Vestiture white, sparsely irrorate with bister, patagia edged dorsally with bister. Wings white ; antemedial fascia on fore wing, medial facia on hind wing and postmedial fascia on each wing bister, slender and sharply marked ; apex, termen between veins M_3 and Cu_1, and medial area of fore wing and proximal two-thirds of hind wing sparsely irrorate, remainder of wings more densely irrorate with bister or a tone paler (Pl. 6, fig. 243). Underside white, suffused and patterned with fuscous (Pl. 6, fig. 247).

♂. Genitalia (Text-figs. 60, 61). Scobinate medial plate of gnathus one and one-third times as broad as cucullus ; scobinate area on valve medio-ventrally ; arm of sacculus aculeate, one-half as long as dorsal margin of valve, posterior edge slightly serrate and setose ; vesica with two cornuti fused at base, one tapered and one-fourth as long as aedeagus, the other one-third as long as aedeagus and tipped with four spines, and with a slender scobinate band equal in length to shorter cornutus.

♀. (Pl. 6, figs. 244, 248). Similar to male externally.

♀. Genitalia (Text-fig. 62). Lamella postvaginalis weakly sclerotized with concentric, semicircular medial ridges ; lamella antevaginalis sclerotized laterally ; colliculum evenly sclerotized ; bursa copulatrix cylindrical, anterior fourth membranous, remainder ribbed and weakly sclerotized at right side.

Measurements. ♂ 38 mm. ; ♀ 40 mm.



Figs. 60–62. *C. aculeata* genitalia. 60, aedeagus ; 61, ♂ ; 62, ♀.

Closely related to the preceding species, *raphis ;* externally well characterized by the very clear white ground colour of the wings, especially prominent at apex and mid-termen of fore wing and by the sharply marked bister pattern ; distinguished structurally by the shorter, slightly serrate process arising from the sacculus and by the cornuti on the vesica in the male and by the degree of sclerotization of the sterigma, colliculum and bursa copulatrix in the female.

Distribution (Map 3). Nigeria.

Holotype ♂. [NIGERIA] : Warri, vi.1897 (*Dr. Roth*), genitalia slide Geometridae No. 2217.

Paratypes : data as holotype, 1 ♂ ; Agberi, Niger, 10.v.1901 (*Ansorge*), 1 ♀.

Cleora panarista sp. n.

(Text-figs. 63–65 ; Pl. 6, figs. 249–252 ; Map 3)

♂. Vestiture white, irrorate with smoke grey and black ; patagia banded with black ; abdominal crest on first segment immaculate, second and third segments black dorsally. Wings white, irrorate with smoke grey and black and, in some examples, suffused with cartridge buff proximad of postmedial fasciae ; transverse fasciae and lateral streaks in discal area black, as illustrated ; antemedial fascia toothed distad in submedial fold, medial fascia toothed proximad on vein A_1 (Pl. 6, fig. 249). Underside white, patterned with fuscous black (Pl. 6, fig. 250).

♂. Genitalia (Text-figs. 64, 65). Minutely serrate medial plate of gnathus just subequal to greatest width of cucullus ; very coarsely scobinate area on valve medio-ventrally ; arm of sacculus smooth, tapered and arcuate, a little longer than greatest width of valve ; vesica with three cornuti, one rod-like and one-half as long as aedeagus, one one-fifth as long as aedeagus and tipped with one long and several shorter spines and one one-fourth as long as aedeagus, arcuate and sharply tapered.

♀. (Pl. 6, figs. 251, 252). Similar to male externally.

♀. Genitalia (Text-fig. 63). Lamella antevaginalis funnel-shaped ; lamella postvaginalis sclerotized with concentric, semicircular ridges medially ; colliculum evenly sclerotized, rather broader than long ; posterior two-thirds of bursa copulatrix sclerotized posteriorly and ribbed, the ribbing extending weakly into the anterior third which is quite membranous.

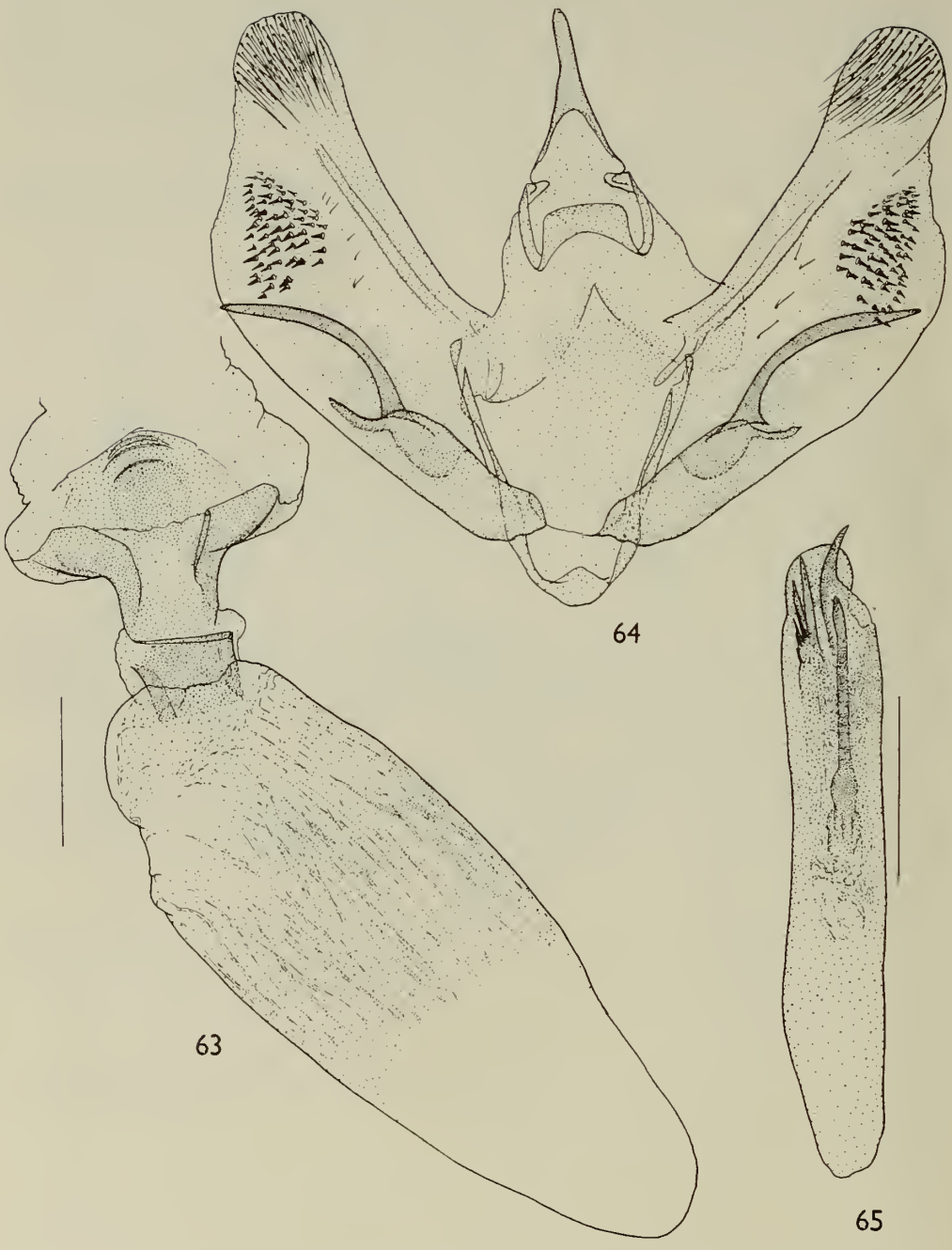
Measurements. ♂ 40–45 mm. ; ♀ 49 mm.

A species strikingly distinct in colour and pattern. Related closely to both *raphis* and *aculeata ;* distinguished structurally by the coarsely scobinate area on the valve, the arcuate, tapered process on the sacculus and the ornamentation of the vesica in the male and by the structure of the sterigma in the female.

The specimens from Malawi are browner than the other material examined ; the smoke grey of the type is nearer cinnamon brown and the black pattern of the type is bister. The difference may be geographical but is more probably due to the considerably greater age of the specimens.

Distribution (Map 3). S.E. Congo (Leopoldville) ; Rhodesia ; Tanzania ; Malawi.

Holotype ♂. S. RHODESIA : Vumba Mts., ii.1956, genitalia slide Geometridae No. 5224.



FIGS. 63–65. *C. panarista* genitalia. 63, ♀ ; 64, ♂ ; 65, aedeagus.

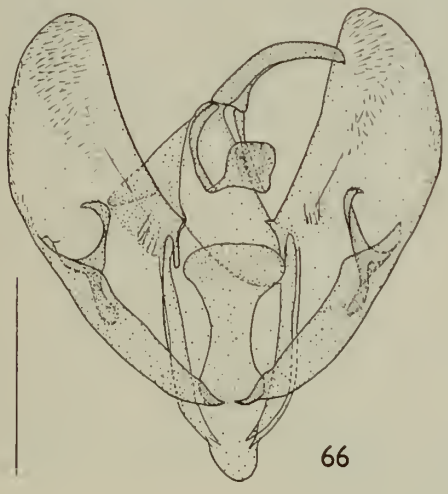
Paratypes : S. Rhodesia : Vumba Mts., ii.1956, 1 ♂ ; ibid., Umtali, i–ii.1960, 1 ♀. [Zambia] N. Rhodesia : Mwinilunga, v.1961, 1 ♀ in National Museum of Rhodesia. [Congo (Leopoldville)] : Elisabethville, 29.iii.1935 (*Ch. Seydel*), 1 ♂ ; ibid., xii.1935, 1 ♂ in Musée Royal de l'Afrique Centrale. [Malawi] Nyasaland : Mt. Mlanje, 7.iii.1913 (*S. A. Neave*), 1 ♀ ; ibid., 14.iv.1916, 1 ♂.

Cleora quadrimaculata (Janse) **comb. n.**

(Text-figs. 66–68 ; Pl. 7, figs. 253–257 ; Map 3)

Neocleora quadrimaculata Janse, 1932 : 269, pl. 8 : 13 ; fig. 100.

♂. Vestiture tilleul buff to pinkish buff, irrorate with cinnamon buff to cinnamon ; patagia and posterior dorsal margins of abdominal segments edged with fuscous black. Wings pinkish buff, varyingly suffused with cinnamon and lightly irrorate with bister ; veins warm buff ;



66

67

68

Figs. 66–68. *C. quadrimaculata* genitalia. 66, ♂ ; 67, aedeagus ; 68, ♀.

transverse fasciae slender and bister (Pl. 7, fig. 253). Underside of wings tilleul buff, weakly suffused with pinkish buff and patterned with fuscous (Pl. 7, fig. 254).

♂. Genitalia very weakly sclerotized (Text-figs. 66, 67). Minutely scobinate medial plate of gnathus semi-circular ; valve rhomboid, apical half of ventral margin minutely setose ; cucullus very shortly spined ; arm of sacculus a broad-based, tapered process with a serrate-edged, setose apex curved ventrad through 90° ; vesica with two stout, tapered cornuti fused at base, each two-thirds as long as aedeagus.

♀. Wings tilleul buff to pinkish buff, irrorate with bister, lightly proximad of postmedial fasciae ; some warm buff irroration, especially on veins, proximad of antemedial fascia on fore wing and posteriorly distad of postmedial fascia on each wing (Pl. 7, figs. 255–257).

♀. Genitalia (Text-fig. 68). Lamella antevaginalis funnel-shaped, similar to that of *panarista ;* lamella postvaginalis evenly sclerotized with small angular projection medio-posteriorly ; colliculum shorter than broad ; bursa copulatrix cylindrical, anterior tip membranous, remainder ribbed and sclerotized, more heavily anteriorly.

Measurements. ♂ 31–37 mm. ; ♀ 32–42 mm.

A small distinctively, cinnamon-coloured species displaying a range of variation in pattern similar to that of *transversaria.* The genitalia, however, show no obvious affinity with *transversaria ;* in the male the form of the sacculus is comparable with that of *raphis, panarista* and *aculeata,* but the valve lacks the area of coarse scobination found in each of those species ; in the female the form of the sterigma is similar to that of *panarista.*

The limited distribution of this Madagascan species along the south east coast of Africa, combined with the apparent lack of subspeciation, suggests that it is probably a recent arrival there.

Distribution (Map 3). S. Africa ; Madagascar.

Holotype ♂. S. Africa : Pondoland, Port St. Johns, 1–7.x.1931 (*Janse*), in Transvaal Museum. Not seen.

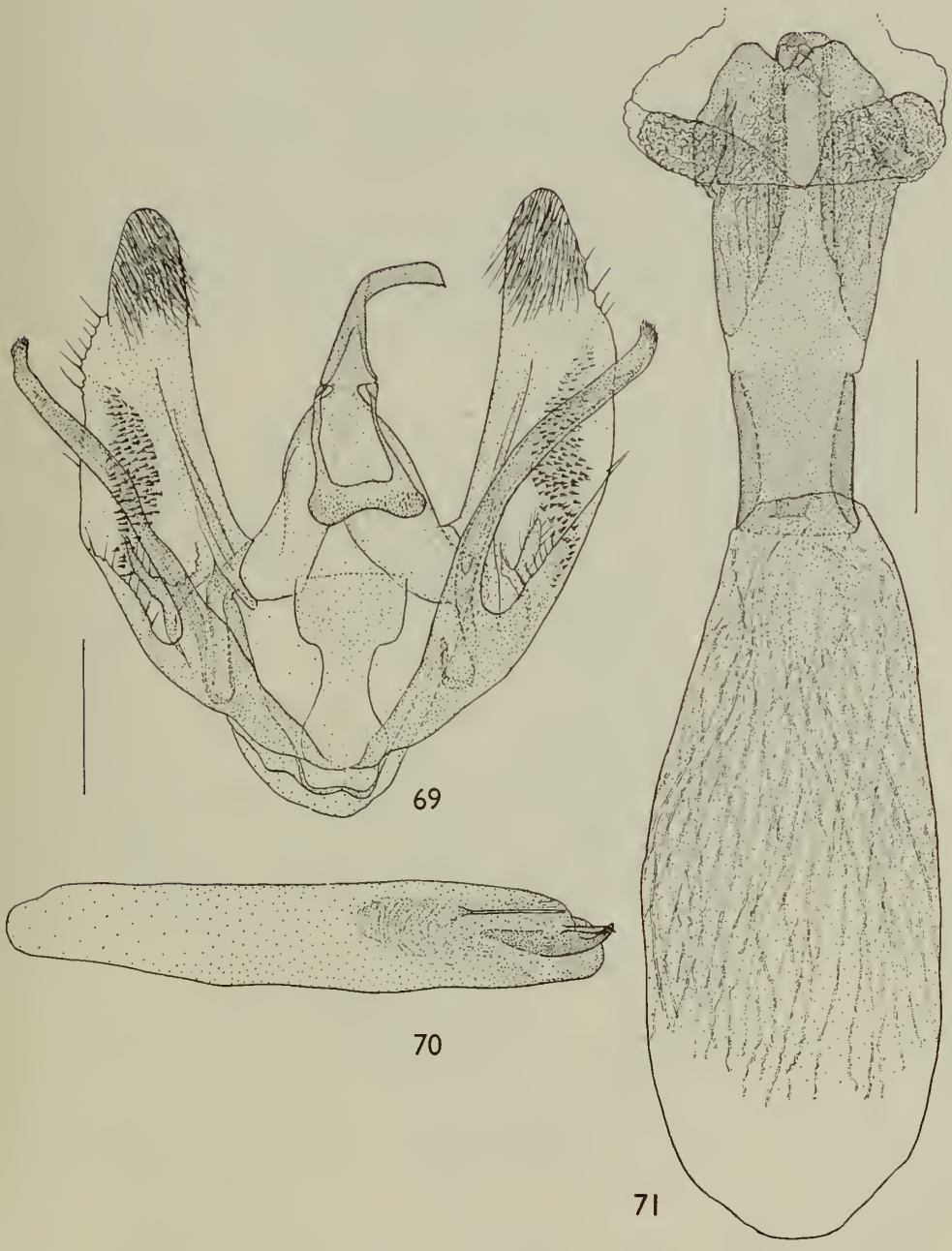
Material examined. S. Africa : Pondoland, Port St. Johns, 10–22.i.1955 (*A. J. T. Janse*), 1 ♂, 1 ♀, in Transvaal Museum ; Port St. Johns, 12–30.vi.1923 (*R. E. Turner*), 1 ♂ ; ibid., v.1924, 1 ♀ ; Natal, Umkomaas, 25.i.1913 (*L. Hargreaves*), 1 ♀. Madagascar : Diego Suarez, 5.ii.1917 (*G. Melou*), 1 ♂ ; ibid., 10–30.iv.1917, 9 ♂, 1 ♀ ; ibid., 15–20.vi.1917, 5 ♂, 3 ♀ ; ibid., 16–29.vii.1917, 1 ♂, 2 ♀ ; Sakaramy, 16.ii.1917 (*G. Melou*), 1 ♀ ; Tananarive, 1 ♂ ; Tananarive (*Stichel*), 2 ♂ ; Analalava, 1 ♀.

Cleora boetschi (Herbulot) **comb. n.**

(Text-figs. 69–71 ; Pl. 7, figs. 258–261 ; Map 3)

Neocleora boetschi Herbulot, 1961 : 495, fig. 3.

♂. Frons and thorax tilleul buff, irrorate with drab and bister ; patagia edged with bister. Abdomen white to tilleul buff ; first segment white and immaculate, remaining segments with a pair of bister spots medio-dorsally. Fore wing white, varyingly suffused with drab and bister ; cubital and anal veins scaled with cinnamon buff ; ante- and postmedial fasciae bister. Hind wing white, patterned as illustrated with bister ; a broad shade distad of postmedial fascia ; medial and cubital veins scaled with cinnamon buff (Pl. 7, fig. 258). Underside of wings white, densely suffused and patterned with fuscous (Pl. 7, fig. 259).



FIGS. 69–71. *C. boetschi* genitalia. 69, ♂ ; 70, aedeagus ; 71, ♀.

♂. Genitalia (Text-figs. 69, 70). Gnathus one and one-half times as broad as greatest width of cucullus, broadly incurved medio-ventrally and minutely scobinate ; a longitudinal, coarsely scobinate band in distal half of valve ; arm of sacculus spatulate, of even width, scobinate at tip and extending to mid-cucullus ; a setose digitate process medially at one-third valve ; vesica with three cornuti, one stout, arcuate and tapered, one very slender and setose at apex, each equal in length to greatest width of aedeagus, and one shorter cornutus with a curved, coarsely serrate apex.

♀. Wings white, lightly irrorate and patterned with bister (Pl. 7, fig. 260) ; hind wing with weakly marked snuff brown shade distad of postmedial fascia ; both wings lightly irrorate with warm buff, especially on medial and cubital veins. Underside of wings white, patterned with fuscous (Pl. 7, fig. 261).

♀. Genitalia (Text-fig. 71). Lamella postvaginalis slenderly produced, posteriorly narrowly rounded ; lamella antevaginalis heavily sclerotized and bilobate posteriorly, anterior edge with two folds sclerotized in a wrinkled and reticulate pattern ; colliculum rather longer than broad with diamond-shaped sclerotized area at mid-anterior margin ; bursa copulatrix of almost even width, posterior four-fifths sclerotized and ribbed, with a more heavily sclerotized disc medio-anteriorly, anterior fifth membranous and slightly dilate.

Measurements. ♂ 44–52 mm. ; ♀ 46–52 mm.

The species is characterized externally by its large size and in the male by the densely suffused, dark underside of the wings. Structurally, the shape of the arm of the sacculus and the ornamentation of the vesica in the male genitalia and the structure of the sterigma in the female genitalia are diagnostic.

Though the sterigma in the female genitalia is considerably modified, the scobination of the valve, the broad, scobinate gnathus and the long arm of the sacculus in the male genitalia suggest an affinity with *aculeata* and with *raphis*.

Distribution (Map 3). Guinea ; Ghana ; Nigeria ; Cameroun ; Congo (Leopoldville) ; Uganda.

Material examined. Holotype ♂. CAMEROUN : N'long [Ngoulemakong], 18.i.1953 (*R. P. Boetsch*), genitalia slide No. C.H.4028 in coll. Herbulot, Paris.

GUINEA : Soundedou, Nr. Macenta, 1600 ft., 13.v.1926 (*C. L. Collenette*), 2 ♂. GHANA : Wassaw dist. 45 miles inland from Sekondi, 1 ♂. S. NIGERIA : Ilesha (*L. E. H. Humfrey*), 2 ♂. CAMEROUN : Batouri, iii.1958, 1 ♂ in National Museum of S. Rhodesia ; Bitje, Ja River, x., wet season (*G. L. Bates*), 2 ♂ and Johann-Albrechts Höhe, 1898 (*L. Conradt*), 1 ♂ in British Museum (Natural History). CONGO (Leopoldville) : Coquilhatville, 9.ix.1955 (*Dr. M. Fontaine*), 1 ♂ ; Equateur, Bokuma, 20.xi.1911 (*Rev. P. Hulstaert*), 1 ♂ ; Eala, 14.iv.1936 (*J. Ghesquière*), 1 ♂ ; Uele, Paulis, 2–4.iv.1956 (*Dr. M. Fontaine*), 2 ♂ ; ibid., 13.xi.1956, 1 ♀ ; ibid., 5.vii.1958, 1 ♀ ; Uele-Itimbiri, La Kulu, 15.iv.1930 (*J. Van den Branden*), 1 ♀ ; Sankuru, Katako-Kombe, 25.iv.1952 (*Dr. M. Fontaine*), 1 ♂ ; ibid., 18.vi.1952, 1 ♂ ; ibid., 6.ix.1952, 1 ♂ ; Lusambo, 17.vi–5.vii.1949 (*Dr. M. Fontaine*), 1 ♂ ; ibid., 2.viii–3.ix.1950, 3 ♂, 3 ♀ ; Kasai, Luluabourg, 18.vi.1953 (*Dr. M. Fontaine*), 1 ♂, all in Musée Royal de l'Afrique Centrale ; W. Kivu, Upper Lowa Valley, Nr. Masisi, 5000–6000 ft., ii.1924, wet season (*T. A. Barns*), 1 ♂ in British Museum (Natural History).

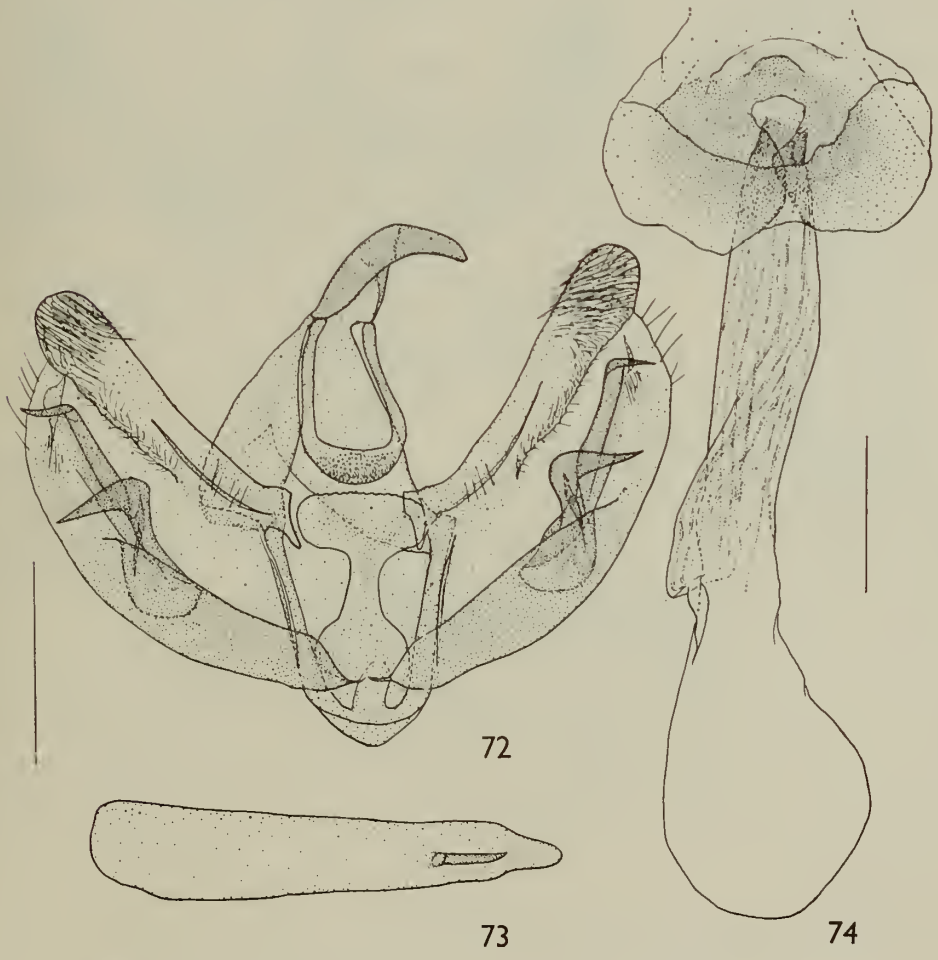
UGANDA : Masaka, Katera, Sango Bay, x.1960 (*R. H. Carcasson*), 1 ♂, in Coryndon Museum.

Cleora bicornis sp. n.

(Text-figs. 72–74 ; Pl. 7, figs. 262–265 ; Map 9)

♂. Vestiture white to tilleul buff ; abdomen, except first segment, lightly irrorate with snuff brown. Fore wing weakly suffused with snuff brown distad of postmedial fascia ; ante- and postmedial fasciae snuff brown and very slender, the former preceded by and the latter followed by a band of cinnamon brown irrorate with light buff ; discal spots white outlined with snuff brown. Hind wing similarly marked, but antemedial fascia and band wanting ; in some examples a snuff brown medial fascia extends from discal spot to anal margin (Pl. 7, fig. 262). Underside of wings white, patterned with snuff brown (Pl. 7, fig. 263).

♂. Genitalia (Text-figs. 72, 73). Medial plate of gnathus smoothly rounded ; sacculus with two tapered processes, the tips of each curved through 90° ; a weakly sclerotized lip just basad of cucullus ; margin of cucullus extended basad, parallel with dorsal margin of valve, pustulate and setose ; aedeagus a little narrowed apicad ; vesica with one tapered cornutus equal in length to width of aedeagus at middle.



FIGS. 72–74. *C. bicornis* genitalia. 72, ♂ ; 73, aedeagus ; 74, ♀.

♀. Similar to male, but underside of wings with broader and darker terminal bands, which are fuscous (Pl. 7, figs. 264, 265).

♀. Genitalia (Text-fig. 74). Lamella antevaginalis consisting of two broad, tongue-like plates overlapping slightly medially ; colliculum shorter than broad ; posterior half of bursa copulatrix ribbed and very weakly sclerotized ; remainder membranous, globular anteriorly.

Measurements. ♂ ♀ 37–44 mm.

In external appearance closely similar to *C. oculata*, but differing in the clearly defined ground colour proximad of the postmedial fascia. In the male genitalia the two tapered processes on the sacculus and in the female genitalia the structure of the sterigma are diagnostic.

The close similarity between *oculata* and *bicornis* in colour and pattern is not reflected in either the male or the female genitalia of the two species. Structurally *bicornis* appears to have no close relative and is for the present placed arbitrarily with those species in which there are well developed processes on the sacculus in the male genitalia.

Distribution (Map 9). Ivory Coast ; Nigeria ; Congo (Leopoldville).

Holotype ♂. W. Africa : Lagos, genitalia slide Geometridae No. 2281.

Paratypes : Ivory Coast : Bingerville, 1–5.viii.1915 (*G. Melou*), 1 ♂ ; ibid., 5–7.viii.1915, 1 ♂. Nigeria : data as type, 12 ♂, 3 ♀ ; Ilesha, (*L. E. H. Humfrey*), 1 ♀. [Congo (Leopoldville)] : Stanleyville, 9.vi.1948 (*Dr. Faniel*), 1 ♂ in Musée Royal de l'Afrique Centrale.

Cleora dargei (Herbulot) **comb. n.**

(Text-figs. 75–77 ; Pl. 7, figs. 266–269 ; Map 4)

Neocleora dargei Herbulot, 1961 : 493, fig. 2.

♂. Vestiture : first abdominal segment white, remainder tilleul buff irrorate with bister ; patagia edged with bister ; twin bister spots medio-dorsally on posterior edge of each abdominal segment except first. Wings tilleul buff, suffused with drab and irrorate and patterned with bister ; antemedial fascia on fore wing and postmedial fascia on each wing bister, the former preceded, the latter followed by broad, snuff brown fascia ; veins warm buff distad of postmedial fasciae, cubital and anal veins interruptedly warm buff to base (Pl. 7, fig. 266). Underside white, suffused and patterned with bister (Pl. 7, fig. 267).

♂. Genitalia (Text-figs. 75, 76). Scobinate medial plate of gnathus narrowly rounded medially ; juxta sclerotized in a Y-shaped pattern ; sacculus extending to one-half ventral margin of valve with a short, tapered, apical projection and a setose, medial ridge ; when closed valves viewed from ventral position, the marginal projections of the sacculus appear triangular in form ; apex of aedeagus evenly rounded ; vesica with two elaborately spined cornuti fused at base, one about one-half as long, the other one-third as long as aedeagus ; the spining varies somewhat individually, but the longer cornutus is usually truncate apically ; the shorter one is dilate at base and has the apex tapered and curved through 45° and bearing usually 2–5 spines.

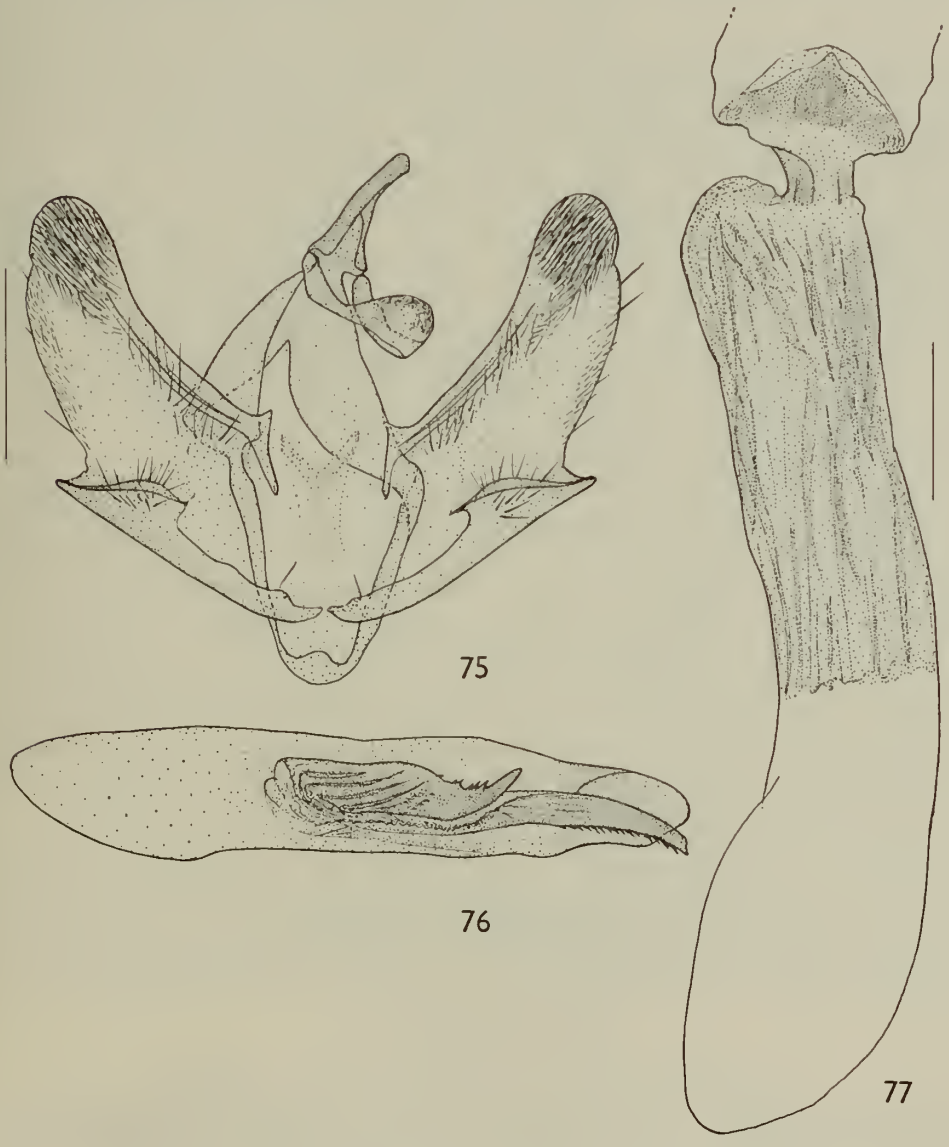
♀. Vestiture similar to that of male, but ground colour white. Wings white, patterned similarly to male, but drab suffusion and bister irroration very light (Pl. 7, fig. 268). Underside white, suffused and patterned with bister (Pl. 7, fig. 269).

♀. Genitalia (Text-fig. 77). Lamella postvaginalis with posteriorly rounded medial plate ;

colliculum as broad as long ; anterior half of bursa copulatrix membranous, posterior half ribbed and sclerotized with a slight shoulder-like projection at one side posteriorly.

Measurements. ♂ 34–44 mm. ; ♀ 38–45 mm.

A long series of both sexes displays little variation in either colour or pattern and no tangible external diagnostic character. In the male genitalia the shape of the sacculus and of the cornuti and in the female genitalia the form and structure of the bursa copulatrix are diagnostic.



FIGS. 75–77. *C. dargei* genitalia. 75, ♂ ; 76, aedeagus ; 77, ♀.

Biology. Moths have been reared from larvae found feeding on *Eucalyptus camaldulensis* Dehnh. in Nigeria and from *Entandrophragma angolense* de Candolle, *Pinus patula* Schiede and *Cupressus* sp. in Uganda.

Distribution (Map 4). Sierra Leone ; Ivory Coast ; Ghana ; Nigeria ; Cameroun ; Gabon ; Angola ; Congo (Brazzaville) ; Congo (Leopoldville).

Material examined. Holotype ♂. CAMEROUN : N'long [Ngoulemakong], 18.i. 1953 (*R. P. Boetsch*), genitalia slide No. C.H.4027 in coll. Herbulot, Paris.

SIERRA LEONE, 1 ♂, 1 ♀ ; ibid. (*A. B. Frere*), 2 ♂, 2 ♀ ; ibid. (*Major Bainbridge*), 1 ♂. IVORY COAST, 1 ♂ ; Bafing river, S of Touba, 1200 ft., 4.vii.1926 (*C. L. Collenette*), 1 ♂ ; Bingerville, xi.1913 (*Gaston Melou*), 2 ♂, 2 ♀ ; ibid., vi, viii–x.1915, 9 ♂, 11 ♀. GHANA : N. Territories, Kete-Krachi (*A. W. Cardinall*), 3 ♀ ; Kumasi, Odumase Swamp, 1913 (*Smeed*), 1 ♂ ; Kumasi, ii–iii.1923 (*N. E. Bell*), 1 ♂ ; Kumasi, ii–iii.1949 (*W. Peters*), 2 ♂, 1 ♀ ; Bibianaha [Bibiani], 700 ft., 10.vi.1912 (*H. G. F. Spurrell*), 1 ♂ ; Ashanti, Goaso (*G. N. Gibbs*), 1 ♂. NIGERIA : Ilesha (*L. E. H. Humfrey*), 2 ♂ ; Lagos, 1 ♂, 6 ♀ ; Warri, 1 ♀. CAMEROUN : Lolodorf, 1894–1895 (*L. Conradt*), 1 ♂ ; Johann-Albrechts Höhe, 1898 (*L. Conradt*), 1 ♀. GABON : Tchibanga (*P. Rougeot*), 1 ♂. CONGO (Brazzaville) ; Brazzaville, viii.1948 (*P. Rougeot*), 1 ♂. CONGO (Leopoldville) : Bopoto (*Kenred Smith*), 3 ♂ ; Yakusu (*K. Smith*), 1 ♂, all in British Museum (Natural History) ; Leopoldville, 11.xi.1953 (*Dr. M. Fontaine*), 1 ♂ ; Leopoldville, Binza, 11.viii.1953 (*Dr. M. Fontaine*), 1 ♂ ; Ubangi, Gemena, i.1936 (*J. Ghesquière*), 1 ♀ ; Equateur, Flandria, 24.ii–20.iv.1932 (*R. P. Hulstaert*), 5 ♂ ; Equateur, Bokota, 1927 (*R. P. Hulstaert*), 1 ♂ ; Bokela, 17.iv.1940 (*R. P. Hulstaert*), 1 ♂ ; Eala, 20.x.1917 (*R. Mayné*), 1 ♀ ; Eala, xi.1936 (*J. Ghesquière*), 1 ♂ ; Ifuta, 21.x.1921 (*Verlaine*), 1 ♀ ; Luebo, x.1930 (*J. P. Colin*), 1 ♂ ; Stanleyville, vi.1929 (*J. Colin*), 1 ♂ ; all in Musée Royal de l'Afrique Centrale ; Upper Uele Dist., Dungu, v, 1 ♀, in British Museum (Natural History) ; Uele, Rungu, 30.iv.1960 (*Dr. M. Fontaine*), 1 ♂ ; Uele, Paulis, i,iv,ix.1956 (*Dr. M. Fontaine*), 1 ♂, 2 ♀ ; Sankuru, Lusambo, 25–29.vi.1949 (*Dr. M. Fontaine*), 2 ♂ ; ibid., 14–20.x.1949, 2 ♂ ; ibid., iv,vii–ix.1950, 5 ♂, 4 ♀, all in Musée Royal de l'Afrique Centrale ; Kasai, Lusambo, ix–x.1919, 4 ♂ in British Museum (Natural History) ; Sankuru, Djeka, 17.xii.1952 (*Dr. M. Fontaine*), 1 ♂ ; Sankuru, Katako-Kombe, i,ii,vii,ix–xii.1951–53 (*Dr. M. Fontaine*), 9 ♂, 4 ♀ ; Kivu, Rwankwi, 9.viii.1947 (*J. V. Leroy*), 1 ♂ ; ibid., 6–7.x.1947, 1 ♂ ; Rutschuru, i.1928 (*Ch. Seydel*), 1 ♂, all in Musée Royal de l'Afrique Centrale ; Lindi River, Bafwasende, 2000 ft., vii.1921 (*T. A. Barns*), 1 ♂, in British Museum (Natural History). UGANDA : Bundibugyo, 3440 ft., 22.viii–3.ix.1952 (*D. S. Fletcher*), 1 ♀ ; Mpanga Forest, [Kampala], 21.iv. 1961, ex *Entandrophragma angolense* (*W. K. Brown*), 1 ♀ ; Mpanga Forest, 21.x.1960, ex *Cupressus* sp. (*W. K. Brown*), 1 ♀ ; Kaweri, 21.xii.1963, ex *Pinus patula* (*W. K. Brown*), 1 ♂.

Cleora dactylata sp. n.

(Text-figs. 78–80 ; Pl. 7, figs. 270–273 ; Map 4)

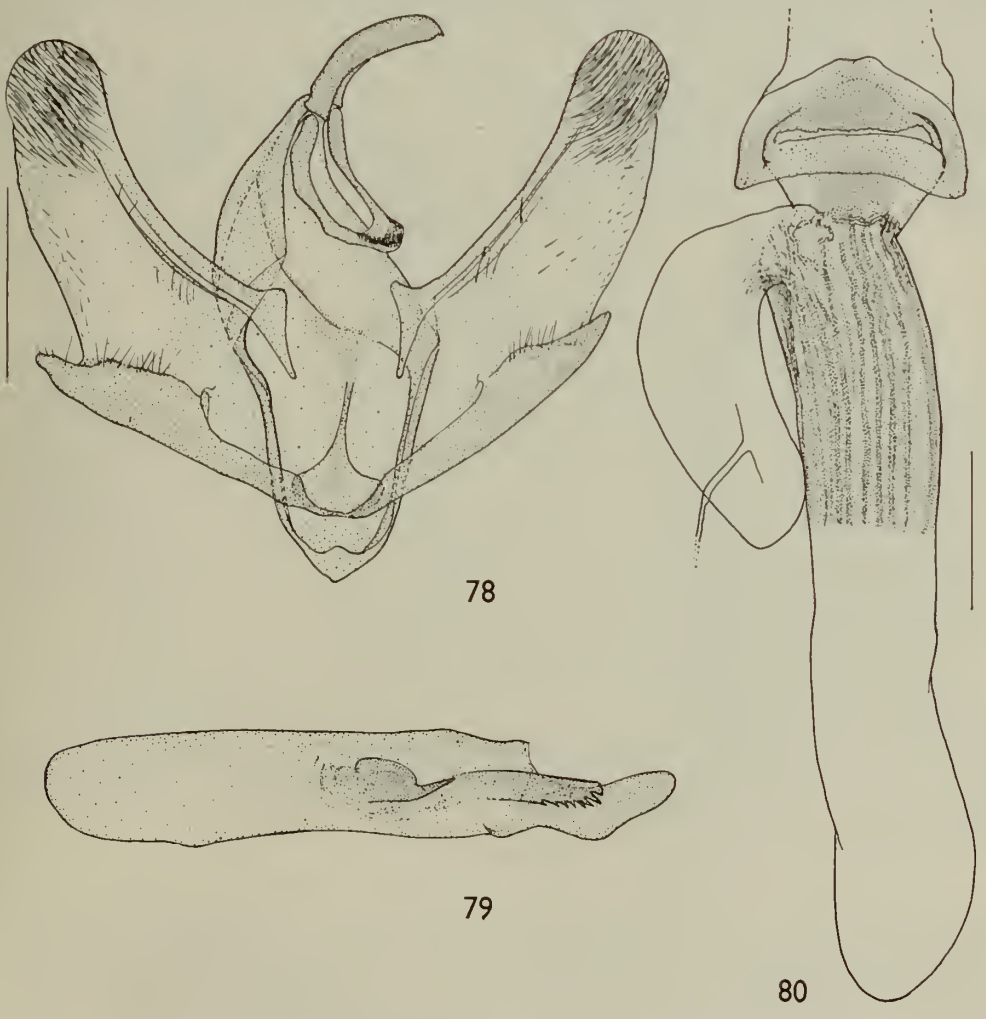
♂ ♀. Externally closely similar in both sexes to *dargei* and appears to be separable only by reference to the genitalia. In one example the medial area of the hind wing and the posterior half of the medial area of the fore wing are densely irrorate with bister.

♂. Genitalia (Text-figs. 78, 79). Gnathus and juxta similar to those of *dargei* ; sacculus extending to one-half ventral margin of valve with inner margin setose and with a short, minutely scobinate, digitate projection from apex ; apical fourth of aedeagus irregularly shaped (Text-fig. 79) ; vesica with two cornuti fused at base, the apical one comb-like at one side and about one-third as long as aedeagus, the other one-sixth as long as aedeagus, tapered and curved through 45° from a bulbous base.

♀. Genitalia (Text-fig. 80). Lamella antevaginalis shallow and broad ; lamella postvaginalis with a triangular, sclerotized pattern medially ; colliculum apparently not developed ; slightly more than anterior half of ductus bursae membranous, remainder sclerotized and ribbed with dilate, membranous additional sac at left side posteriorly.

Measurements. ♂ 31–42 mm. ; ♀ 43–46 mm.

Closely related to *dargei* with which it occurs, examples of each species having been taken by Dr. Fontaine at Katako-Kombe on consecutive days. Differs



FIGS. 78–80. *C. dactylata* genitalia. 78, ♂ ; 79, aedeagus ; 80, ♀.

structurally from *dargei* in the male genitalia in the slender slightly scobinate, digitate extension of the sacculus, in the irregular shape of the apex of the aedeagus and in the shape of the cornuti on the vesica. In the female genitalia the form of the sterigma, the absence of a colliculum and the development of the dilate, membranous additional sac are diagnostic.

Distribution (Map 4). Congo (Leopoldville) ; W. Uganda.

Holotype ♂. [Congo (Leopoldville)] ; W. Kivu, Nr. Masisi, Upper Lowa Valley, 5000–6000 ft., forest and long grass, ii.1924, wet season (*T. A. Barns*), genitalia slide Geometridae No. 2297.

Paratypes. [Congo (Leopoldville)] : data as holotype, 1 ♂ ; Nr. Walikili, 3000–4000 ft., forest, ii.1924, wet season (*T. A. Barns*), 2 ♂ all in British Museum (Natural History) ; Sankuru, Katako-Kombe, 27.xii.1951 (*Dr. M. Fontaine*), 1 ♂ ; ibid., 23–24.vii.1952, 2 ♂ ; ibid., 10.ix.1952, 1 ♂ ; ibid., 15.xi.1952, 1 ♀ ; ibid., 11.i.1953, 1 ♂ ; Lusambo, 24.vii.1949 (*Dr. M. Fontaine*), 1 ♂ ; Luluabourg, 20.viii.1955 (*Ch. Seydel*), 1 ♀ ; Uele, Paulis, 18.ii.1956 (*Dr. M. Fontaine*), 1 ♂ ; ibid., 12.iv.1956, 2 ♂, 1 ♀ ; ibid., 3.v.1956, 1 ♂ ; Boyenga, 1930 (*Delpièrre*), 1 ♂ ; Fomlioko, 20.ii.1921 (*Verlaine*), 1 ♂ ; Boende, 1.iv.1940 (*R. P. Hulstaert*), 1 ♂, all in Musée Royal de l'Afrique Centrale. Uganda : Bwamba, v.1956 (*R. Carcasson*), 1 ♂, 1 ♀.

Cleora thyris sp. n.

(Text-figs. 81–83 ; Pl. 8, figs. 274–280 ; Map 4)

♂. First abdominal segment white, remainder of vestiture white, irrorate with bister. Wings white, irrorate and patterned with bister ; terminal interneural spots, medial and postmedial fasciae on each wing, discal streak and antemedial fascia on fore wing sharply marked and a shade darker ; cubital veins and other veins distad of postmedial fasciae streaked with warm buff (Pl. 8, fig. 274). Underside tilleul buff, suffused and patterned with bister (Pl. 8, fig. 275).

♂. Genitalia (Text-figs. 81, 82). Gnathus with semi-circular scobinate medial plate, equal in diameter to two-fifths width of cucullus, the scobination extending posteriorly along subscaphium ; process from sacculus spatulate and incurved, outer surface of apex and inner surface of base pustulate and setose ; vesica with two cornuti, one of even width, serrate at one side and scobinate on ventral and dorsal surfaces apically, five-eighths as long as aedeagus, the other tapered sharply, scobinate at one side apically and one-fourth as long as aedeagus.

♀. Vestiture white, very lightly irrorate with bister, abdominal segments, except first, with a pair of bister spots medio-posteriorly. Wings white, patterned as in male, but irroration very light and sparse ; buff colouring on veins paler and weakly marked. (Pl. 8, figs. 276, 277).

♀. Genitalia (Text-fig. 83). Medial area of lamella postvaginalis heavily sclerotized in horseshoe pattern ; colliculum one and one-half times as long as broad ; ostium bursae broad and shallow, anterior margin sharply defined ; anterior fourth of bursa copulatrix membranous, remainder sclerotized and ribbed.

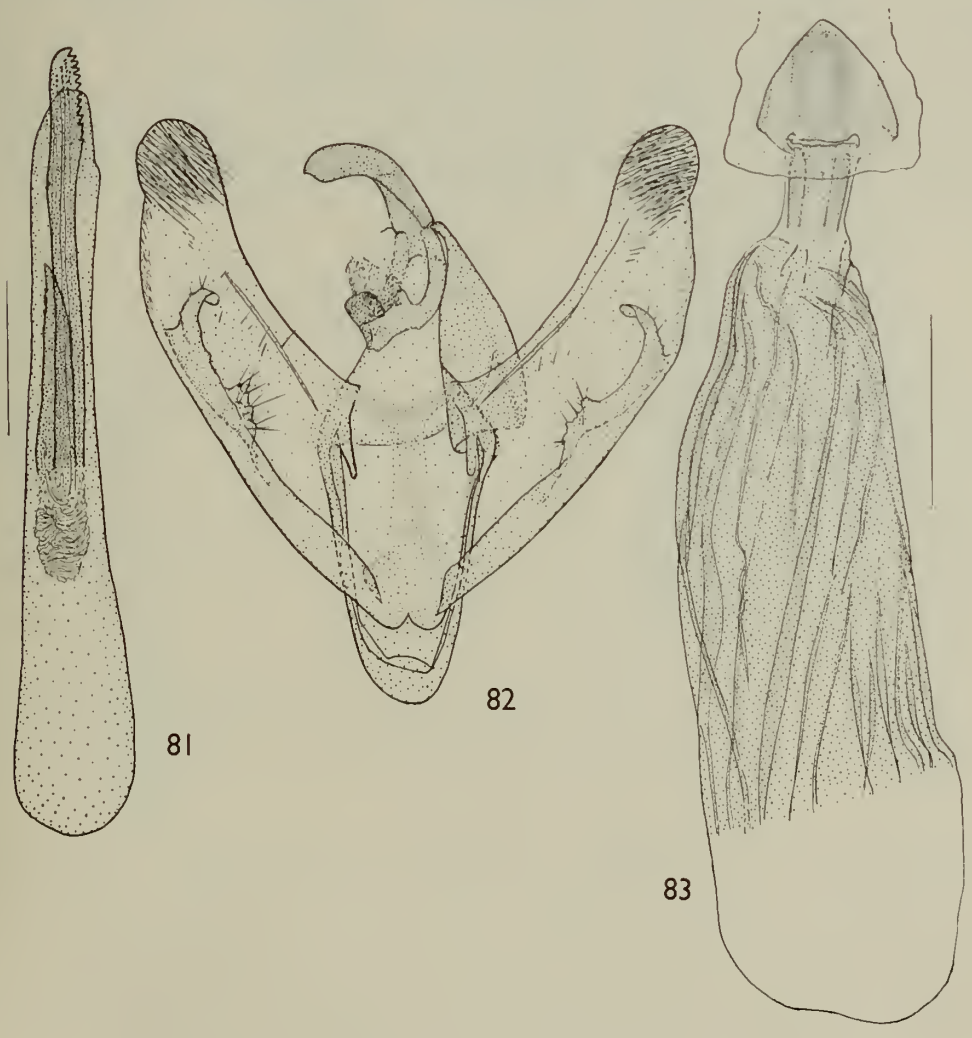
Measurements. ♂ 38–50 mm. ; ♀ 40–50 mm.

The species is variable in colour and pattern, displaying a range of polymorphism similar to that of *tulbaghata* and *nigrisparsalis ;* in examples of both sexes the area proximad of the antemedial fascia on the fore wing is ochraceous buff and distad of the postmedial fascia on each wing there is a broad band of the same colour, comparable with *tulbaghata* ab. *flavipleta ;* in another example the ochraceous buff

is replaced by bister (Pl. 8, fig. 278). There are further examples in which the medial area of each wing is suffused with fuscous black comparable with *tulbaghata* ab. *fumata* (Pl. 8, fig, 279) ; discal spots may be heavily ringed with or be entirely fuscous black (Pl. 8, fig. 280). The genitalia afford the most certain means of identifying *thyris ;* in the male the process on the sacculus and in the female the broad, shallow ostium bursae together with the form and proportions of the membranous and sclerotized parts of the bursa copulatrix are diagnostic.

Distribution (Map 4). Ethiopia ; Kenya ; N.W. Congo (Leopoldville) ; Tanzania ; Malawi.

Holotype ♂. B.E.A. [KENYA] : Kyambu, 18.vii.1919 (*W. Feather*).



FIGS. 81–83. *C. thyris* genitalia. 81, aedeagus ; 82, ♂ ; 83, ♀.

Paratypes ; Ethiopia : Negelli, v.1962 (*S. Chojnacki*), 2 ♂. Kenya : N.F.D., Marsabit, 4500 ft., ii.1956 (*J. G. Williams*), 1 ♂, 3 ♀ ; ibid., vi.1955, 1 ♂ in Coryndon Museum ; Mt. Marsabit, 4500 ft., ii.1946 (*T. H. E. Jackson*), 1 ♂ ; Mt. Elgon, vii.1951 (*T. H. E. Jackson*), 1 ♂ ; Kitale, xi.1953 (*C. R. Howard*), 1 ♂ ; Nakuru, 14.iv.1952 (*A. L. H. Townsend*), 1 ♀ ; Nyeri, vii.1950 (*A. L. H. Townsend*), 1 ♀ ; Nyeri (*H. B. Kettlewell*), 2 ♀ ; data as holotype, 12 ♂, 12 ♀ ; Nairobi, April–June (*van Someren*), 2 ♂, ibid., 27.vi.1918, 1 ♂, all in British Museum (Natural History) ; Nairobi, Karura Forest, iii.1949 (*E. Pinhey*), 1 ♀ ; Nairobi, iv–vi. (*van Someren*), 2 ♂ ; ibid., 27.vi.1918, 1 ♂ ; ibid., x.1923, 1 ♀ ; Nairobi, Thika [Road], v.1950 (*E. Pinhey*), 1 ♂, all in Coryndon Museum ; Meru District, Mt. Kenya, ix.1930 (*Mrs. H. Young*), 1 ♂ ; Mt. Meru, Kenya distr., 5600 ft., xii.1920 (*W. N. van Someren*), 1 ♀, all in British Museum (Natural History). [Congo (Leopoldville)] : Kibali-Ituri, Mt. Rowa, 5.xii.1952 (*J. Hecq*), 1 ♂ in Musée Royal de l'Afrique Centrale. [Tanzania] Tanganyika : W. Kilimanjaro, Ngare-Nairobi, 5000 ft., ii–iii.1937 (*B. Cooper*), 1 ♂ ; Amani, 28.xi.1934 (*Mrs. Editha Dalton*), 1 ♂, both in British Museum (Natural History) ; Makoa, 7–27.i.1959 (*Lindner*), 2 ♂, 1 ♀ ; ibid., 6–25.ii.1959, 2 ♂, 2 ♀ in Zoological Museum, Stuttgart. [Malawi] Nyasaland : Mlanje, 30.iv.1913, 1 ♂, in British Museum (Natural History).

Cleora nigrisparsalis (Janse) comb. n.

(Text-figs. 84–86 ; Pl. 8, figs. 281–286 ; Map 4)

Neocleora nigrisparsalis Janse, 1932 : 270, pl. 8 : 5 ; fig. 100.

♂. Vestiture white, irrorate with fuscous black, lightly on first abdominal segment. Wings white, densely irrorate and patterned with fuscous black (Pl. 8, fig. 281). Underside of wings white, patterned with fuscous black (Pl. 8, fig. 282).

♂. Genitalia (Text-figs. 84, 85). Scobinate medial plate of gnathus semicircular, equal in diameter to two-fifths width of cucullus ; a small spatulate, digitate process from apex of sacculus ; vesica with two cornuti fused at base, one of even width, apex serrate at one side, dorsal and ventral surfaces scobinate apically, one-half as long as aedeagus, the other tapered sharply apicad and one-seventh as long as aedeagus.

♀. Similar in pattern to male ; upperside of wings less heavily, but more evenly irrorate with fuscous black (Pl. 8, figs. 283, 284).

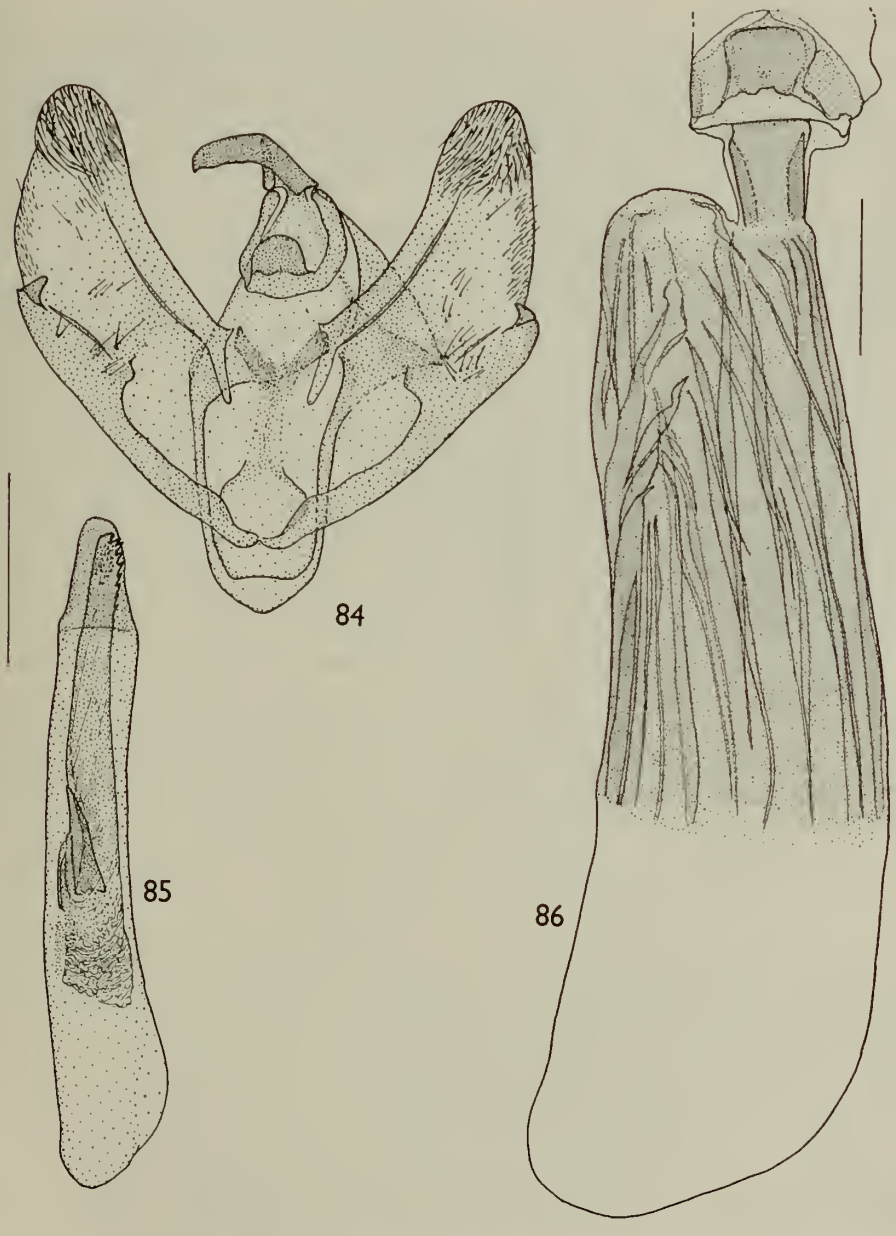
♀. Genitalia (Text-fig. 86). Anterior margin of lamella postvaginalis irregularly shaped ; colliculum one and one-quarter times as long as greatest width, slightly broadened posteriorly, posterior margin sharply defined ; anterior three-sevenths of bursa copulatrix membranous, remainder sclerotized and ribbed with a shoulder-like projection at one side of posterior margin.

Measurements. ♂ 40–44 mm. ; ♀ 41–52 mm.

The range of variation in colour and pattern in *nigrisparsalis* is similar to that found in both *thyris* and *tulbaghata ;* the similar forms in each species are virtually indistinguishable except by genitalia. Typical forms of *nigrisparsalis* (Pl. 8, figs. 281–284) are recognisable externally by the dense fuscous black irroration of the upperside of the wings and by the sharply contrasted and well-defined fuscous black and white pattern of the underside. Structurally the small digitate process on the sacculus and the shape and proportions of the cornuti on the vesica in the male genitalia and the shape of the sterigma, the sharply defined posterior margin of the

colliculum and the shape and proportions of membranous and sclerotized parts of the bursa copulatrix are diagnostic.

Biology. Larvae have been found damaging the foliage of coffee (*C. arabica*) at Ruiru in Kenya.



FIGS. 84–86. *C. nigrisparsalis* genitalia. 84, ♂ ; 85, aedeagus ; 86, ♀.

Distribution (Map 4). Natal ; Transvaal ; Mozambique ; Malawi ; Zambia ; Rhodesia ; Tanzania ; Kenya ; Burundi ; Congo (Leopoldville) ; Angola.

Holotype ♂. S. Rhodesia, Umtali, in Transvaal Museum, Pretoria ; not examined.

Material examined. Natal : Pietermaritzburg, Malta, i–ii.1927–8 (*G. van Son*), 8 ♂, 2 ♀ in British Museum (Natural History), 6 ♂ in Transvaal Museum ; Natal National Park, Mont-aux-Sources, 30.i.1954, 1 ♂ ; Muden, 15 iii.1955 (*H. Cookson*), 1 ♀ in Transvaal Museum. Transvaal : White River, ii.1909 (*A. T. Cooke*), 1 ♂ ; Barberton (*Harrison*), 1 ♂ ; Barberton (*A. A. Williams*), i.1933, 1 ♂ ; Marieps Mtn., 6–14.i (*G. van Son*), 3 ♂, 1 ♀, in British Museum (Natural History), 2 ♂ in Transvaal Museum ; Pretoria, i.1913 (*Gladstone*), 1 ♂ ; Tshakoma, Zoutpansberg, xi.1931 (*G. van Son*), 1 ♂ ; Magoebaskloof, iv.1933 (*Rev. D. P. Murray*), 1 ♀ ; Erasmus Reserve, Pilgrim's Rest District, 30.iv.1960 (*F. Neubecker*), 3 ♂ ; Kowyn's Pass, Pilgrim's Rest District, 22.ii.1962 (*Vari & Leleup*), 1 ♀, all in Transvaal Museum. Mozambique : Dondo, ix.1954 (*H. Cookson*), 1 ♀. Malawi : Zomba, 3000 ft., iv.1913 (*E. Ballard*), 1 ♂ ; Zomba, i.1921 (*H. Barlow*), 2 ♂, 1 ♀ ; ibid., v.1920, 1 ♀, all in British Museum (Natural History). Rhodesia : Nr. Bulawayo, Khami, iii.1956, 2 ♂ ; Marandellas, ii,x,xi.1960, 3 ♂, 1 ♀ ; Vumba Mts., Umtali, iii,xi,xii, 4 ♂ ; Umtali District, i–iii, 2 ♀, all in National Museum of Rhodesia ; Umtali, i–iii,vi, 1 ♀, in Transvaal Museum, 2 ♂ in British Museum (Natural History). Salisbury, iii,iv,v,vii, 5 ♂ in National Museum of Rhodesia, 2 ♂ in British Museum (Natural History) ; Inyanga, iv.1961, 1 ♂ in National Museum of Rhodesia ; Penalonga (*O. A. Kidwell*), 1 ♂ ; Mt. Selinda, 17–31.i.1959 (*G. van Son*), 1 ♂ ; Mt. Selinda, 8–9.iii.1954 (*H. Cookson*), 1 ♀, all in Transvaal Museum ; Victoria Falls, 10.iv.1927 (*R. H. R. Stevenson*), 1 ♂ ; Shamva, ii.1921 (*O'Neil*), 1 ♂ ; Mountain Inn, Melsetter, xi.1950 (*H. B. Kettlewell*), 1 ♂, 1 ♀. Zambia : Kashitu, 14.v.1915 (*H. C. Dollman*), 1 ♂ ; N'dola, 4.i.1923, 1 ♂, all in British Museum (Natural History) ; Abercorn, ii–iii.1954 (*D. Vesey-Fitzgerald*), 2 ♂, both in Coryndon Museum. Tanzania : Makoa, 7–27.i.1959 (*Lindner*), 1 ♀ in Zoological Museum, Stuttgart ; Mamboia (*Dr. Baxter*), 1 ♀ in British Museum (Natural History). Kenya : Nairobi, v.1927 (*D. M. Hopkins*), 1 ♀ ; ibid., i.1953 (*E. Pinhey*), 1 ♀ in Coryndon Museum ; ibid., 8.ix.1927 (*Mrs. D. M. Hopkins*), 1 ♂, 1 ♀ ; ibid., x.1920 (*W. N. van Someren*), 1 ♀ ; ibid., ii.1928, 1 ♀ ; ibid., 8.iv.1912 (*C. Montague Smyth*), 1 ♂ ; ibid., bred 1937 (*R. H. Simmonds*), 1 ♂ ; ibid., 5500 ft., iii.1939 (*MacInnes*), 1 ♀ ; Nairobi Plains, Kikuyu, 5.v.1900 (*R. Crawshay*), 1 ♂ ; Makueni, Machakos [District], vi.1958, 1 ♂ in Coryndon Museum ; Ruiru, vi.1963 (*P. E. Wheatly*), 3 ♂, 3 ♀ ; Mt. Kenya, vii.1930 (*E. Barns*), 5 ♀ ; Ndarugu, 18–19.vi.1917 (*W. Feather*), 2 ♂ ; Suna, S. Kavirondo, i.1932 (*W. Feather*), 4 ♂, 1 ♀, all in British Museum (Natural History). Burundi : Kitega, iii,vi–x.1962 (*Dr. M. Fontaine*), 35 ♂, 17 ♀. Congo (Leopoldville) : Kibali-Ituri, Nioka, vi,vii,x,xi (*J. Hecq*), 2 ♂, 4 ♀ all in Musée Royal de l'Afrique Centrale ; Elisabethville, i–iv, x–xii (*Ch. Seydel*), 9 ♂ in Musée Royal de l'Afrique Centrale, 7 ♂, 2 ♀ in British Museum (Natural History). Angola : Bihé, xii.1934–i.1935 (*E. Braun*), 2 ♂.

Cleora tulbaghata (Felder) **comb. n.**

(Text-figs. 87–89 ; Pl. 9, figs. 289–296, 301 ; Map 4)

Boarmia tulbaghata Felder, 1875, pl. 125 : 5.
Chogada acaciaria sensu Warren, 1904 : 474.
Chogada acaciaria ab. *flavipleta* Warren, 1904 : 474.
Chogada acaciaria ab. *fumata* Warren, 1904 : 474.
Neocleora munda sensu Janse, 1932 : 267, text-fig. 100.

♂. Genitalia (Text-figs. 87, 88). Medial plate of gnathus narrowly rounded at tip, which is one-third as broad as cucullus ; sacculus moderately sclerotized with a short, membranous, triangular apical projection at about two-thirds ventral margin of valve ; vesica with two cornuti fused at base, one one-half as long as aedeagus, the apical fourth dilate, with one side coarsely serrate and with ventral surface scobinate, the other one-fifth as long as aedeagus and sharply tapered apicad.

♀. Genitalia (Text-fig. 89). Sclerotization of lamella postvaginalis extends posteriorly very slenderly at each side of short medial plate ; colliculum one and one-third times as long as broad, without sharply defined posterior margin ; anterior two-sevenths of bursa copulatrix membranous, remainder sclerotized and ribbed with a shoulder-like projection at one side of posterior margin.

Measurements. ♂ 33–49 mm. ; ♀ 35–49 mm.

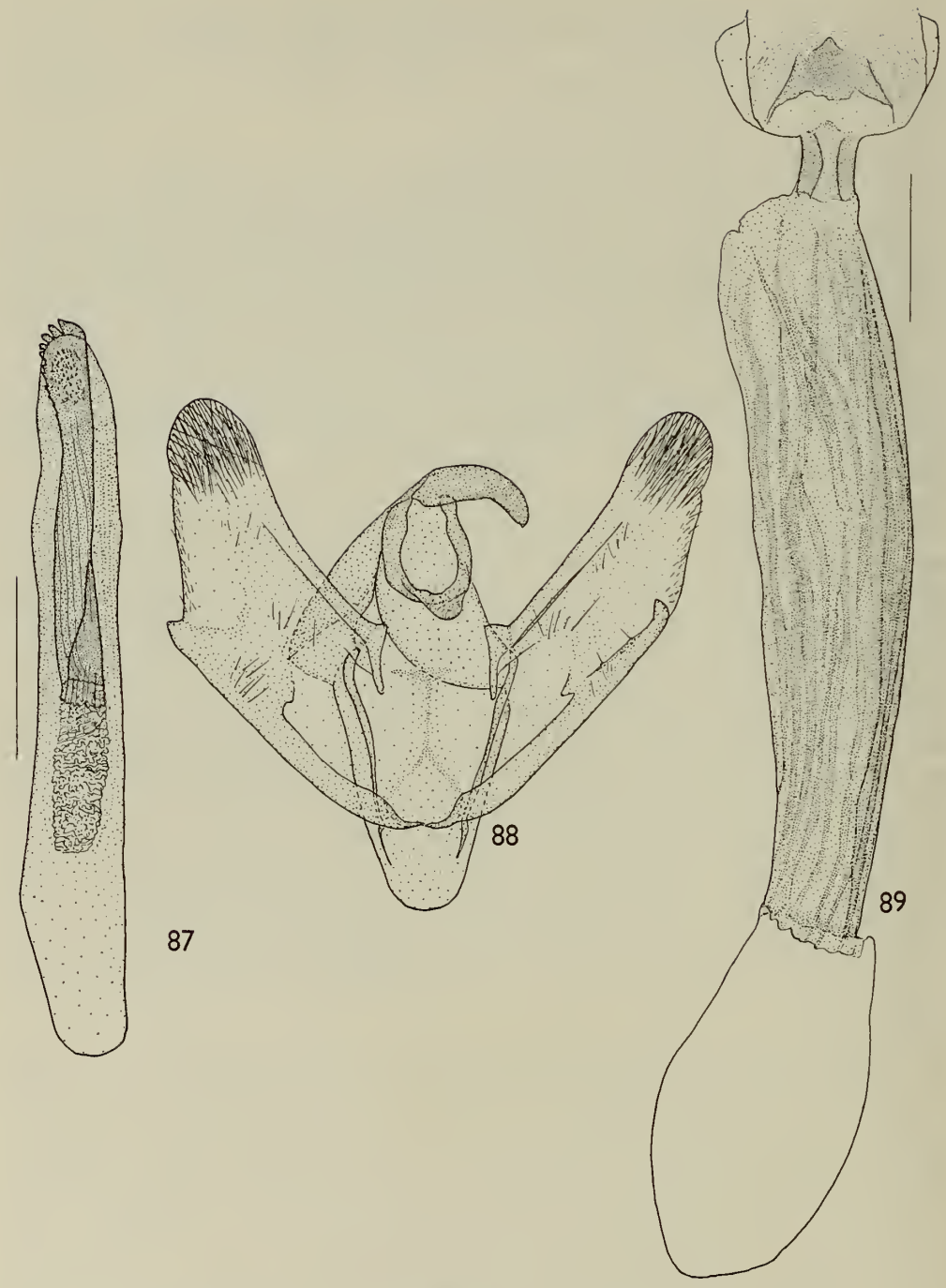
A species variable in colour and pattern. In the commonest form the ground colour of the male is white, irrorate with drab and fuscous ; the transverse fasciae are fuscous black and the veins are interruptedly light buff distad of the postmedial fasciae (Pl. 9, fig. 289) ; the underside of the wings is white, patterned with fuscous (Pl. 9, fig. 290). In this form the female is similarly patterned, but the irroration, which is sparse, and the transverse fasciae are bister (Pl. 9, fig. 291).

The holotype (Pl. 9, fig. 296) is white, very lightly suffused with ochraceous and patterned with fuscous. In marking it remains unique, but is closely approached by a recurrent form (Pl. 9. fig. 295) in which the antemedial fascia of the fore wing and the postmedial fascia on each wing are broadly fuscous, the former edged proximally, the latter edged distally with snuff brown.

Another recurrent form, ab. *flavipleta* Warren (Pl. 9, fig. 293), has the area proximad of the antemedial fascia on the fore wing and broad bands distad of the postmedial fascia on each wing ochraceous buff to ochraceous orange.

In ab. *fumata* Warren (Pl. 9, fig. 294) the medial area of the fore wing and the area proximad of the postmedial fascia on the hind wing are densely irrorate with fuscous.

A completely black form (Pl. 9, fig. 301) occurs in part of the Fish Hoek Valley in Cape Province. It is referred to by Dr. H. B. D. Kettlewell (1957 : 9, pl. 5), who found it resting on the fire-blackened trunks of a species of *Acacia*. In a subsequent personal communication Dr. Kettlewell writes : " It is one of the few examples I know of a southern hemisphere Lepidopteron having a clear-cut melanic form, nor do I know of it anywhere else except in the very local area of the Fish Hoek Valley. In this locality, the species seems to depend on an introduced Australian shrub, Rooikrans [*Acacia cyclops* A. Cunn.]—a sort of fire-resistant myrtle. The Valley is regularly burned out by the coloureds who lived there and the tree trunks were completely blackened everywhere. The insects sat on these trunks, where the



FIGS. 87–89. *C. tulbaghata* genitalia. 87, aedeagus ; 88, ♂ ; 89, ♀.

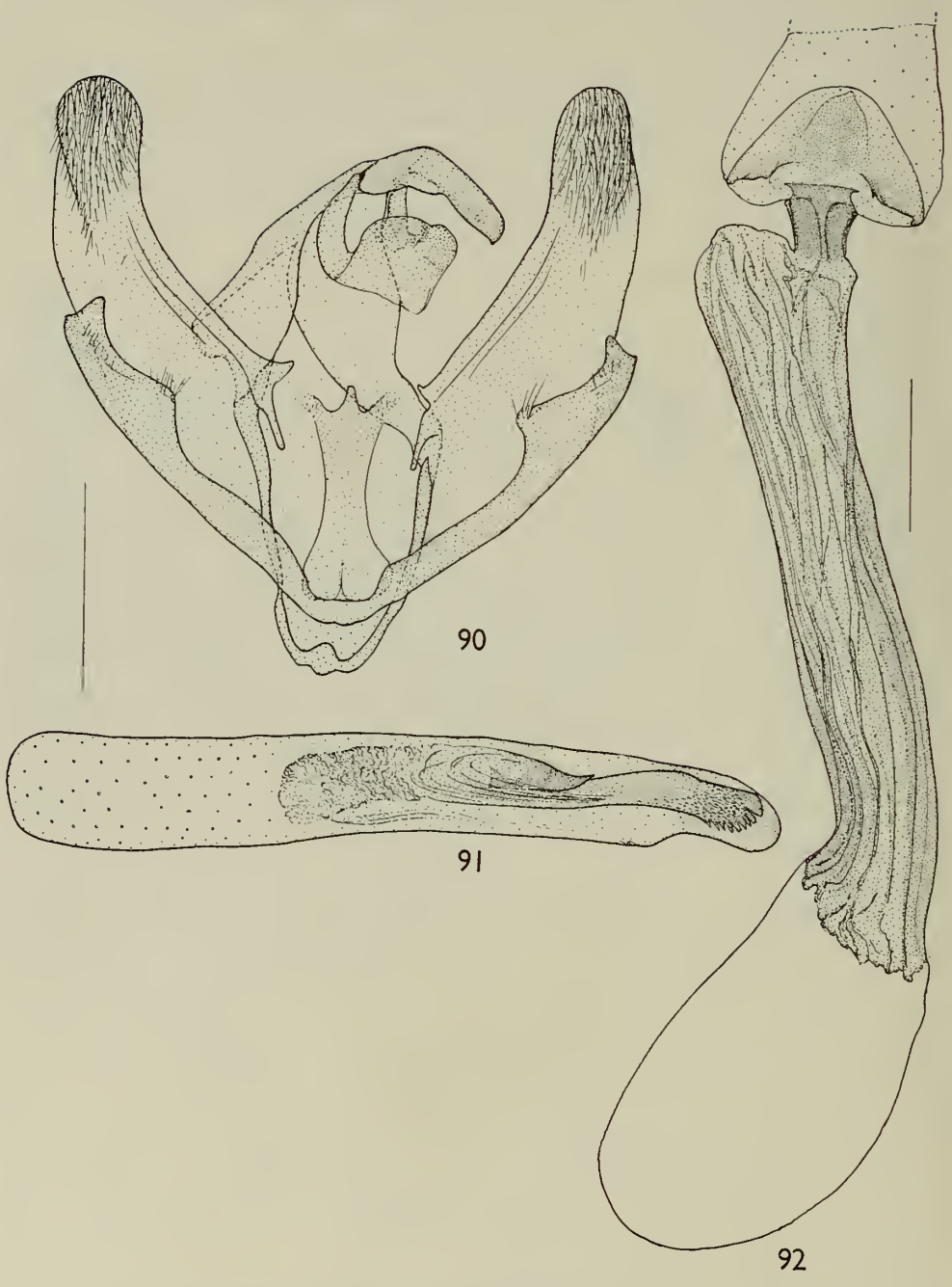
melanic form appeared to me to have considerable cryptic advantage. I would say that the melanic form was between 4 and 10 per cent. of the population over the the period I collected ."

The species is closely related to *thyris*, *nigrisparsalis* and to the following species, *munda ;* in the male genitalia the shapes and sizes of the medial plate of the gnathus and of the process on the sacculus and the shape of the broadly spatulate cornutus on the vesica are diagnostic ; in the female genitalia the shape of the sclerotized parts of the sterigma, the colliculum and the bursa copulatrix are diagnostic.

Distribution (Map 4). Kenya ; Zambia ; Mozambique ; Transvaal ; Natal ; Cape Province.

Material examined. Holotype ♂ (without abdomen). KNYSNA, C. W., ex coll. Felder.

KENYA : Suna, S. Kavirondo, iv.1930 (*W. Feather*), 1 ♂ ; ibid., i.1931, 1 ♂ ; Kibwezi, 11.i.1917 (*W. Feather*), 1 ♀. ZAMBIA : (*Gimson*), 2 ♂, 1 ♀. MOZAMBIQUE : Lorenzo Marques (Distant Coll.), 1 ♂ ; Lorenzo Marques, 3.vii.1949 (*H. B. Kettlewell*), 1 ♂ ; Magude, x.1918 (*C. J. Swierstra*), 1 ♀ ; Delagoa Bay (*Monteiro*), 2 ♀. TRANSVAAL : Barberton (*Harrison*), 2 ♀ ; Three Sisters, 28.ii.1911 (*A. J. T. Janse*), 1 ♀. ZULULAND : (*G. F. Leigh*), 1 ♂, 1 ♀ in British Museum (Natural History) ; Eshowe, i.1956 (*D. A. Swanepoel*), 1 ♀ in Transvaal Museum. NATAL : Durban, Umhlanga, 13–20.viii.1950 (*H. B. D. Kettlewell*), 2 ♂ ; Umhlanga Rocks, 6.ii.1955 (*C. G. C. Dickson*), 1 ♀ in Transvaal Museum ; Durban (*G. F. Leigh, Col. Bowker, Stella Bush, C. G. C. Dickson*), 26 ♂, 18 ♀ in British Museum (Natural History), 3 ♂, 1 ♀ in Transvaal Museum ; Port Natal (*Guenzius*), 3 ♂, 2 ♀ ; Pinetown (*G. F. Leigh*), 2 ♂, 1 ♀ ; Krantzkloof, 18.i.1918 (*L. Hargreaves*), 1 ♂ ; Umkomaas, 25.xii.1910 (*L. Hargreaves*), 1 ♂ ; ibid., 8.ii.1913, 1 ♂ ; Port Shepstone, 12.i.1924 (*Lt. Col. G. R. Oakes*), 1 ♂. CAPE PROVINCE : E. Griqualand (*Kendall*), 1 ♂, 1 ♀ ; E. Cape, Kamanassie, ix.1949 (*H. Bridges*), 1 ♂ in Transvaal Museum ; Pondoland, Port St. Johns, i–v.1924 (*R. E. Turner*), 5 ♂, 7 ♀ ; ibid., 23–26.viii.1950 (*H. B. D. Kettlewell*), 2 ♂, 1 ♀ ; ibid., 10–22.i.1955 (*A. J. Janse*), 3 ♂, 1 ♀ in Transvaal Museum ; W. Pondoland, Nggeleni, 17.iii.1904 (*H. H. Swinny*), 1 ♂ ; East London, 19.iii.1913 (*G. F. Leigh*), 2 ♂, 1 ♀ ; Grahamstown, 1 ♀ ; Port Elizabeth, ii,iii,iv (*C. G. C. Dickson*) 1 ♂, 2 ♀ in Transvaal Museum ; Groot River Pass, 22–23.i.1955 (*A. J. T. Janse*), 1 ♂ in Transvaal Museum ; Knysna, C.W. (ex coll. Felder), 3 ♂, 1 ♀ ; Wilderness, Knysna Forest, 20.x–8.xi.1952, at M.V. light (*H. B. D. Kettlewell*), 23 ♂, 12 ♀ ; ibid., 6–20.ii.1934, 1 ♂, 4 ♀ ; Knysna, 10–20.i.1958 (*A. J. T. Janse*), 1 ♂, 2 ♀ and 24.vi.1950 (*C. G. C. Dickson*), 1 ♀ in Transvaal Museum ; Belvedere, 10.iii–3.iv.1921 (*Dr. H. G. Breijer*), 1 ♂, 2 ♀ ; Harkerville, 9.iii.1921 (*Dr. H. G. Breijer*), 1 ♂ ; Mossel Bay, 15.iii–20.iv.1932 (*R. E. Turner*), 1 ♂ ; Cape Town, ix.1877, 1 ♂ ; ibid., i.1871, 1 ♂ ; ibid., v.1912 (*Lord Gladstone*), 1 ♂ ; ibid., 14–21.i.1961 (*C. G. C. Dickson*), 1 ♂, 1 ♀ in Transvaal Museum ; Cape Town, Camps Bay, i,ii,viii,ix,xi,xii (*A. J. Duke*), 5 ♂, 1 ♀ in Transvaal Museum ; Cape Town, Seapoint, 13.x.1953 (*A. J. Duke*), 1 ♂ in Transvaal Museum ; Mowbray, ii.1950 (*A. J. Duke*), 1 ♂ in Coryndon Museum ; Cape Town, Kirstenbosch, 5–29.xii.1954 (*A. T. J. Janse*), 2 ♂, 1 ♀ and Clovelly, ii,iv,xii (*D. A. Swanepoel*), 3 ♂, 1 ♀ in Transvaal Museum ; Simonstown, (*H. G.*



FIGS. 90–92. *C. plax* genitalia. 90, ♂ ; 91, aedeagus ; 92, ♀.

Hunt), 3 ♀ ; Fish Hoek, x–xi.1949 (*H. B. D. Kettlewell*), 2 ♂ ; ibid., 1949–1950, 6 ♂, 1 ♀ ; ibid., 28.iii.1950, 23 ♂, 5 ♀ ; ibid., 15.iv.1950, 1 ♂ ; ibid., i–iii.1950, at light, 22 ♂, 7 ♀ ; Fish Hoek Valley, 10.xi.1952–3.iii.1953, M.V. light (*H. B. D. Kettlewell*), 23 ♂, 9 ♀ ; Fish Hoek-Kommetje, 1951 (*H. B. D. Kettlewell*), 1 ♂.

Cleora plax sp. n.

(Text-figs. 90–92 ; Pl. 8, figs. 287, 288 ; Map 4)

♂. Vestiture white, irrorate with drab and bister ; patagia edged with fuscous. Wings white, lightly irrorate with bister ; broad snuff brown fascia proximad of antemedial fascia on fore wing ; similar fascia distad of postmedial fascia on each wing ; cubital veins and remaining veins distad of postmedial fascia on each wing interruptedly warm buff ; other markings fuscous in holotype, (a very fresh specimen), bister in remainder of series (Pl. 8, fig. 287). Underside of wings white, suffused with fuscous (Pl. 8, fig. 288).

♂. Genitalia (Text-figs. 90, 91). Scobinate medial plate of gnathus shallow and broad, equal in width to cucullus ; apex of sacculus truncate with short, digitate process inclined towards mid-valve ; apex of aedeagus narrowly rounded and inclined to one side ; vesica with two cornuti fused at base, one slightly sinuous with apical fourth dilate and spatulate and with one side coarsely serrate and ventral surface scobinate, the whole about one-half as long as aedeagus, the other tapered sharply apicad, one-sixth as long as aedeagus.

♀. Upperside of wings patterned similarly to that of male, but irroration, especially in basal area of fore wing and medial area of each wing, greatly reduced. Fuscous pattern of underside restricted to discal spots and terminal bands, narrow on hind wing.

♀. Genitalia (Text-fig. 92). Anterior margin of lamella postvaginalis sinuous and produced medially ; colliculum slightly longer than broad, posterior margin sharply defined ; anterior third of bursa copulatrix membranous, remainder sclerotized and ribbed with a shoulder-like projection at one side of posterior margin.

Measurements. ♂ 40–41 mm. ; ♀ 46 mm.

Similar externally to forms of *thyris*, *tulbaghata* and *munda*. Male genitalia similar to those of *nigrisparsalis* and *tulbaghata* in structure of sacculus and similar to *tulbaghata* in shape of cornuti ; the broad, shallow scobinate medial plate of the gnathus is distinctive. In the female genitalia the posterior margin of the lamella postvaginalis is diagnostic.

Distribution (Map 4). N.E. Congo (Leopoldville) ; W. Uganda.

Holotype ♂. Uganda : Masaka, Katera, Sango Bay, x.1960 (*R. H. Carcasson*), genitalia slide Geometridae No. 5289.

Paratypes : [Congo (Leopoldville)] : Escarpment, west of Semliki Valley, 20 mls. south-west of Boga, 3500–4000 ft., vii.1924, borders of tropical forest and long grass country (*T. A. Barns*), genitalia slide Geometridae No. 2299, 1 ♂ in British Museum (Natural History) ; Mongbwalu (Kilo), 1937, (*Me. Harford-Jordens*), 1 ♀ ; Kilo, i.1940 (*RR. FF. Maristes*), 2 ♂ ; Mambunga via Boma (*R. P. Bittremieux*), 1 ♀, all in Musée Royal de l'Afrique Centrale.

Cleora munda (Warren) comb. n.

(Text-figs. 93–95 ; Pl. 9, figs. 297–300, 302 ; Map 4)

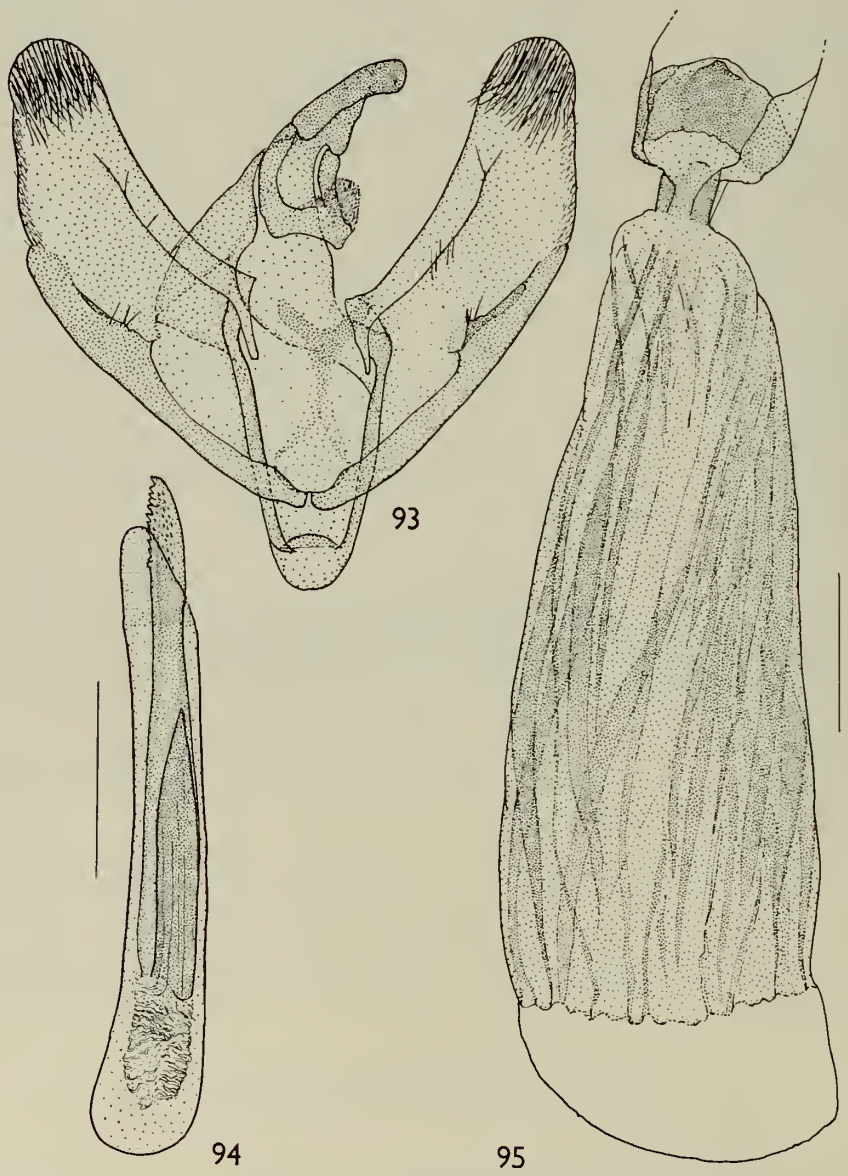
Chogada munda Warren, 1899 : 52.

♂. Genitalia (Text-figs. 93, 94). Medial plate of gnathus narrowly rounded, as in *tulbaghata* ;

sacculus moderately sclerotized but without process ; vesica with two cornuti fused at base, one five-sixths as long as aedeagus, of even width and with apical sixth coarsely serrate at one side, the other one-half as long as aedeagus and tapered apicad.

♀. Genitalia (Text-fig. 95). Anterior margin of lamella postvaginalis irregularly shaped ; short colliculum as broad as long ; posterior margin produced and only on this part is the margin sharply defined ; anterior sixth of bursa copulatrix membranous, remainder ribbed and sclerotized.

Measurements. ♂ 36–45 mm. ; ♀ 42–50 mm.



Figs. 93–95. *C. munda* genitalia. 93, ♂ ; 94, aedeagus ; 95, ♀.

Closely similar in colour and pattern to the commonest form of *tulbaghata*, from which it can seemingly be distinguished only by the structure of the genitalia ; variation in pattern is markedly less common than in that species. In some examples the medial area of each wing is densely suffused with fuscous ; one example has ochraceous buff bands comparable with *tulbaghata* ab. *flavipleta ;* the holotype remains unique in pattern, with sharply defined transverse fasciae on a white ground colour (Pl. 9, fig. 302).

In the male genitalia the simple sacculus and the shape of the cornuti, and in the female genitalia the form of the short colliculum and the proportions of the membranous and sclerotized parts of the bursa copulatrix are diagnostic.

Distribution (Map 4). Kenya ; Tanzania ; Malawi ; Rhodesia ; Transvaal ; Natal ; Cape Province.

Material examined. Holotype ♀. ZULULAND : Edukumbaan Hills, v.1895, genitalia slide Geometridae No. 2145.

KENYA : Kitale, v.1953 (*C. R. Howard*), 1 ♂ in Coryndon Museum ; Nairobi (*van Someren*), 4 ♂ ; Kenya coast, Shimba Hills, xii.1961 (*R. H. Carcasson*), 1 ♂ in Coryndon Museum. TANZANIA : Usambara, Amani, iv.1952 (*C. Howard*), 1 ♂ in Coryndon Museum ; E. Usambara, Amani, ii.1953 (*E. Pinhey*), 1 ♀ in Coryndon Museum ; Amani, iii–iv.1936 (*B. Cooper*), 2 ♂, 2 ♀ ; Amani, 28.xi.1934 (*Mrs. Edith Dalton*), 2 ♀. MALAWI : Mlanje, 10.iv.1913, 1 ♂ ; Mlanje Boma, 2400 ft., 27.iv.1910 (*S. A. Neave*), 1 ♀ ; Chintiche (*T. H. Lloyd*), 1 ♀. RHODESIA : Mt. Selinda, 17–31. i.1959 (*G. van Son*), 1 ♂ ; ibid., 9–17.iv.1956 (*G. van Son & L. Vari*), 1 ♂, 1 ♀ in Transvaal Museum ; Umtali District, 16.i.1933 (*P. A. Sheppard*), 1 ♀ ; ibid., 23.iii. 1934, 1 ♀, both in National Museum of S. Rhodesia. TRANSVAAL : Zoutpansburg, Tshakoma, xi.1931 (*G. van Son*), 1 ♀ ; Magoebaskloof Rest Camp, 4000 ft., 21.ii.1960 (*R. F. Lawrence*), 1 ♂ ; Cyprus Farm, near Ofcolaco, 24–28.ix.1961 (*L. Vari*), 2 ♀ ; Mariepskop, 16.iv.1955 (*H. Cookson*), 1 ♂, all in Transvaal Museum ; Marieps Mtn., 5.xii.1925–6.i.1926 (*G. van Son*), 5 ♂, 2 ♀ ; Pilgrim's Rest Distr., Erasmus Reserve, 30.iv.1960 (*F. Neubecker*), 4 ♂, 1 ♀ in Transvaal Museum ; Pilgrim's Rest Distr., Kowyn's Pass, 22.ii.1962 (*L. Vari & Leleup*), 1 ♀ in Transvaal Museum ; Louws Creek, xi.1922 (*H. G. Williams*), 1 ♂. NATAL : Hluhluwe, 16.iii.1952 (*Dr. G. van Son*), 1 ♂ in Transvaal Museum ; Pinetown, 6.iii.1910 (*G. F. Leigh*), 1 ♂ ; Durban, ii,v,vi,x (*C. G. C. Dickson*), 7 ♂, 1 ♀ in Transvaal Museum ; Pietermaritzburg, Malta, i–ii.1928 (*G. van Son*), 4 ♂, 3 ♀ in British Museum (Natural History), 2 ♀ in Transvaal Museum. CAPE PROVINCE : Port St. Johns, 10–22.ii.1955 (*A. J. T. Janse*), 2 ♂ in Transvaal Museum.

Cleora lamottei (Herbulot) **comb. n.**

(Text-figs. 96–98 ; Pl. 10, figs. 305–308, 320 ; Map 5)

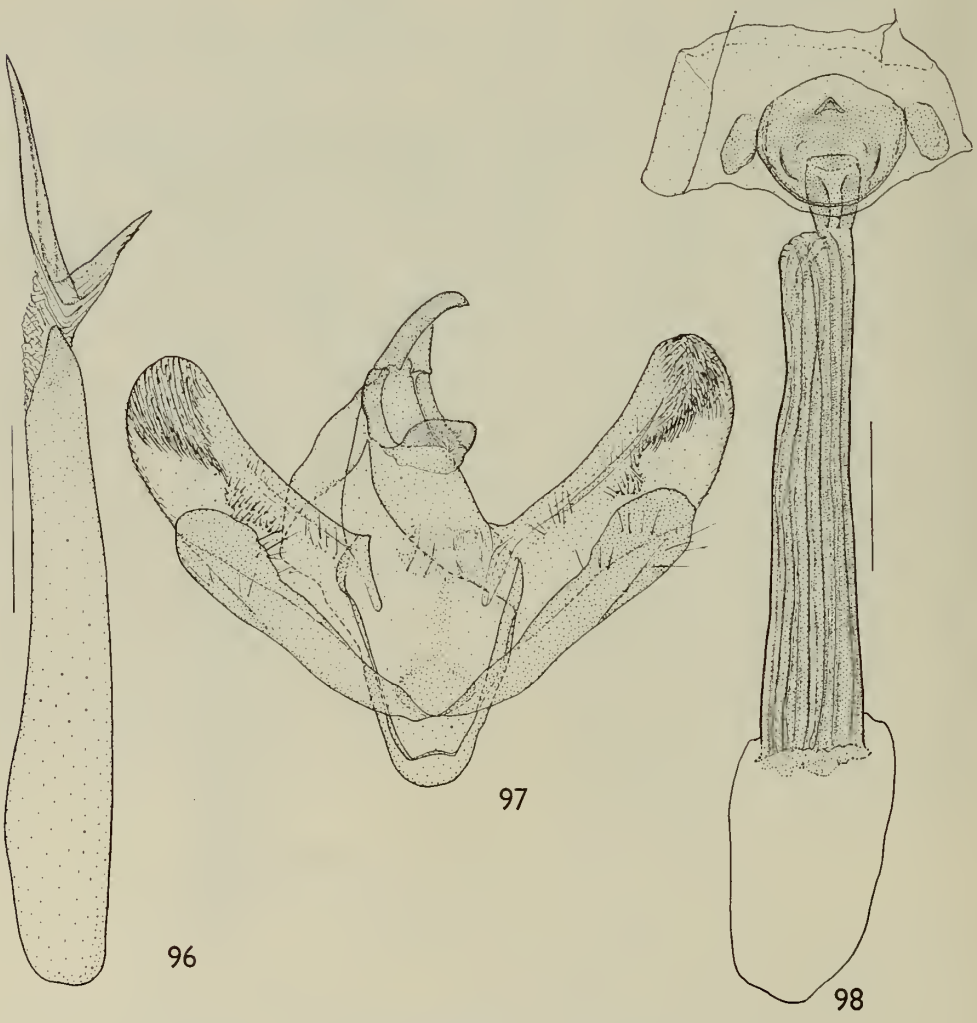
Neocleora lamottei Herbulot, 1954 : 322, pl. 1 : 4, text-fig. 13.
Neocleora lamottei Herbulot ; Herbulot, 1958 : 103.

♂. First abdominal segment white ; remainder of vestiture white, irrorate with bister ; patagia edged with bister. Wings white, irrorate with bister ; a broad snuff brown band

proximad of antemedial fascia on fore wing ; a similar band distad of postmedial fascia on each wing; anal vein on fore wing and other veins distad of postmedial fasciae interruptedly light buff to ochraceous tawny (Pl. 10, fig. 305). Underside of wings white, densely suffused with bister (Pl. 10, fig. 306).

♂. Genitalia (Text-figs. 96, 97). Uncus with minute, thorn-like tip ; scobinate medial plate of gnathus as broad as cucullus ; a sclerotized, spined semicircular dilation arises at mid-dorsal margin of valve and extends towards mid-valve, the spining continuous with that of cucullus ; apex of juxta as broad as gnathus ; apex of sacculus in form of a broad, spatulate and slightly setose blade-like process ; vesica with two tapered cornuti fused at base, one two-fifths as long as aedeagus and with a minute, but pronounced and more strongly sclerotized tip, the second one-fifth as long as aedeagus, stout and with two or three short spines at one side below tapered apex.

♀. Differs from male in upperside of wings, in reduced bister irroration and in having less



Figs. 96–98. *C. lamottei* genitalia. 96, aedeagus ; 97, ♂ ; 98, ♀.

heavily marked discal spots and in reduction of snuff brown bands in posterior half of fore wing and on hind wing (Pl. 10, fig. 307). Differs in underside in reduction of bister suffusion in proximal half of each wing (Pl. 10, fig. 308).

♀. Genitalia (Text-fig. 98). Sterigma almost circular with a sclerotized disc at each side ; a short, thorn-like projection from lamella postvaginalis medio-posteriorly ; colliculum tapered a little anteriorly ; anterior third of bursa copulatrix membranous and a little dilate, remainder cylindrical, ribbed and sclerotized.

Measurements. ♂ 34–39 mm. ; ♀ 37–46 mm.

In a series of nearly 100 males and 40 females, seven males and five females are comparable with *tulbaghata* ab. *flavipleta*, having a broad band of warm buff to ochraceous tawny proximad of the antemedial fascia on the fore wing and similar bands distad of the postmedial fascia on each wing (Pl. 10, fig. 320) ; two males and one female are comparable with *tulbaghata* ab. *fumata*, in which the medial area of the fore wing and the hind wing, proximad of the postmedial fascia, are suffused with fuscous ; one male combines the characters of both forms.

Tentatively placed after *tulbaghata* and *munda* on account of the similar range of variation in pattern shown by the moths ; the form of the female genitalia suggests an affinity with the following species, *toulgoetae*, but otherwise appears an isolated species.

In the male genitalia the form of the gnathus, juxta and sacculus and the proportions of the two cornuti and in the female genitalia the development of the sterigma are diagnostic.

Distribution (Map 5). Sierra Leone ; Guinea ; Ghana ; Nigeria ; Cameroun ; Gabon ; W. Congo (Leopoldville) ; Principe I. ; São Thomé I.

Material examined. Holotype ♂. GUINEA : Monte Nimba, 30.viii.1951 (*M. Lamotte & R. Roy*) in Muséum national d'Histoire naturelle, Paris.

ST. PRINCIPE : 1500–2000 ft., iv–v.1928 (*T. A. Barns*), 10 ♂, 5 ♀. SIERRA LEONE : 1 ♂. IVORY COAST : Bingerville, v,vi,viii–xii (*G. Melou*), 38 ♂, 18 ♀ ; Agboville, 1–8.vi.1915 (*G. Melou*), 1 ♀. GHANA : A'koon, 4.i.1919 (*G. Harrison*), 1 ♂ ; Ashanti (*Mrs. D. Houston*), 2 ♂ ; Ashanti, Goaso (*G. H. Gibbs*), 1 ♂ ; Bibianaha [Bibiani] 70 miles N.W. of Dimkwa, 700 ft., ii,v (*H. G. F. Spurrell*), 2 ♂, 2 ♀ ; Coomassie [Kumasi] (*H. Whiteside*), 3 ♂, 2 ♀ ; Ashanti, Juaso (*G. H. Gibbs*), 1 ♂ ; Abossi (*Dr. J. J. Wilson*), 1 ♀ ; Tarkwa, 3 ♂, 2 ♀ ; Wassaw distr., 45 miles inland from Sekondi, 1 ♂ ; Sekondi, xii.1921 (*N. E. Bell*), 1 ♂. NIGERIA : Lagos, 2 ♂ ; Ilesha (*Capt. L. E. H. Humfrey*), 1 ♂, 1 ♀ ; Warri, iv–viii.1897 (*Dr. Roth*), 4 ♂, 2 ♀ ; Degama [Degema] (*Dr. Ansorge*), 1 ♂ ; Ikom, 18.v.1930 (*E. Haig*), 1 ♂ ; Old Calabar, 2 ♂, 2 ♀. CAMEROUN : Johann-Albrechts Höhe, 1898 (*L. Conradt*), 7 ♂, 2 ♀ ; Lolodorf, 1894–1895 (*L. Conradt*), 6 ♂ ; Bitje, Ja River, x, wet season (*G. L. Bates*), 1 ♀ ; Epulan [Efulen], 2.iv.1926 (*G. Schwab*), 1 ♂. GABON : Ogowe, 1890–1894 (*L. Gazengel*), 2 ♂ ; Lastourville (*P. C. Rougeot*), 3 ♂ ; Tchibanga, iv,xi (*P. C. Rougeot*), 6 ♂. CONGO (Leopoldville) : Kitobola, 1911 (*Rovère*), 2 ♂ ; Equateur, Bokote, 19.i.1926 (*R. P. Hulstaert*), 1 ♂ and Tshuapa, Flandria, 18.x.1947 (*Rev. P. Hulstaert*), 1 ♀, in Musée Royal de l'Afrique Centrale.

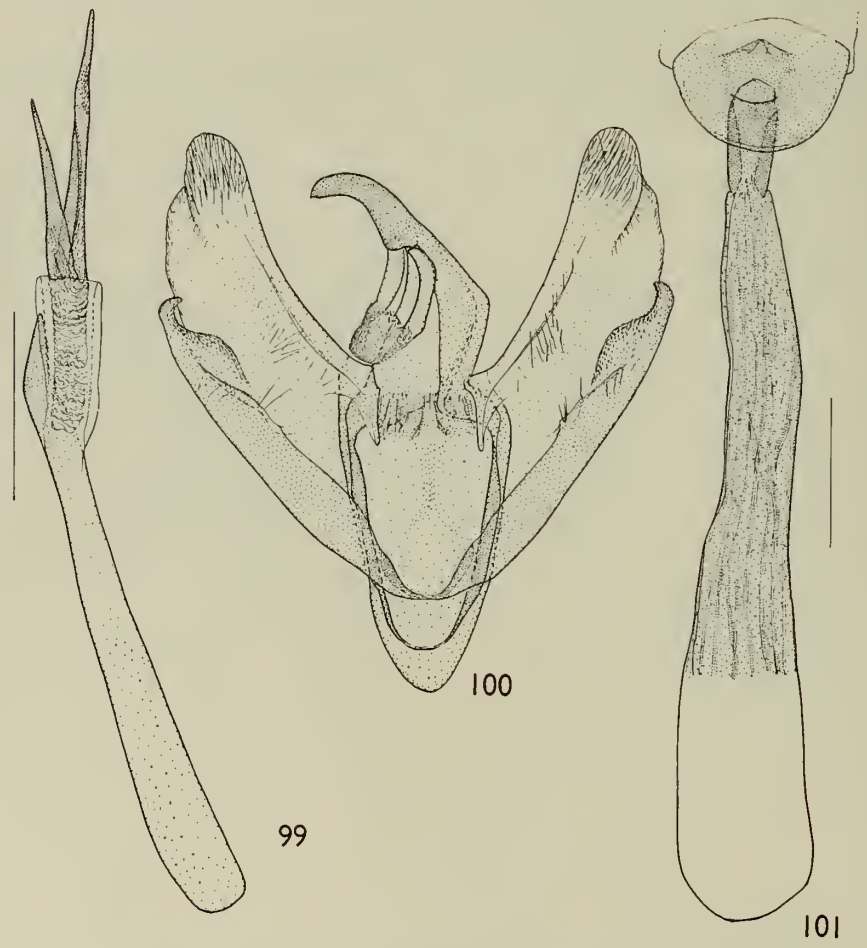
Cleora toulgoetae (Herbulot) **comb. n.**

(Text-figs. 99–101 ; Pl. 10, figs. 309–312 ; Map 5)

Neocleora toulgoetae Herbulot, 1961 : 493, fig. 1.

♂. First abdominal segment white ; remainder of vestiture white, irrorate with pale drab and bister ; patagia edged with bister. Wings white ; sub-basal area of fore wing and bands distad of postmedial fascia on each wing pinkish cinnamon to cinnamon ; remainder of wing patterned and irrorate with bister ; cubital veins and other veins distad of postmedial fasciae streaked with warm buff (Pl. 10, fig. 309). Underside of wings white, suffused and patterned with fuscous (Pl. 10, fig. 310).

♂. Genitalia (Text-figs. 99, 100). Scobinate medial plate of gnathus almost semicircular, base as broad as cucullus, scobination extending posteriorly along subscaphium ; apex of juxta sclerotized broadly ; apical third of sacculus dilate and scobinate, more heavily on inner surface scobination extending to cover slender, over-curved, spatulate apex ; vesica with two tapered cornuti fused at base, one one-half and one one-third as long as aedeagus ; the longer cornutus is



Figs. 99–101. *C. toulgoetae* genitalia. 99, aedeagus ; 100, ♂ ; 101, ♀.

lightly and minutely scobinate on one surface just apicad of middle, the shorter one usually smooth, but occasionally one or two adpressed spines are situate mid-way along one surface.

♀. Upper surface of wings differs in reduction of darker irroration and in better definition of pattern, especially of the cinnamon transverse bands (Pl. 10, fig. 311). Under surface less suffused and pattern more sharply defined (Pl. 10, fig. 312).

♀. Genitalia (Text-fig. 101). Lamella antevaginalis semicircular ; lamella postvaginalis with angular projection medio-dorsally ; colliculum twice as long as broad, posterior margin sharply defined ; anterior third of bursa copulatrix ovate and membranous, remainder ribbed and sclerotized.

Measurements. ♂ ♀ 32–40 mm.

Variation in the degree and extent of the dark irroration on the upperside of the wings occurs in the male ; in one female the hind wing, proximad of the medial fascia, and the posterior half of the medial area of the fore wing are suffused with fuscous, comparable with *tulbaghata* ab. *fumata*. Structurally the form of the female genitalia suggest an affinity with the preceding species, *lamottei*. Weakly irrorate specimens are externally distinct, especially the females, in their small size and in their cinnamon to pinkish cinnamon transverse bands. Structurally the shape of the sacculus in the male genitalia and that of the sterigma in the female genitalia are diagnostic.

Distribution (Map 5). Guinea ; Sierra Leone ; Ivory Coast ; Ghana ; Nigeria ; Fernando Po ; Cameroun ; Gabon ; Angola ; Congo (Leopoldville) ; Burundi.

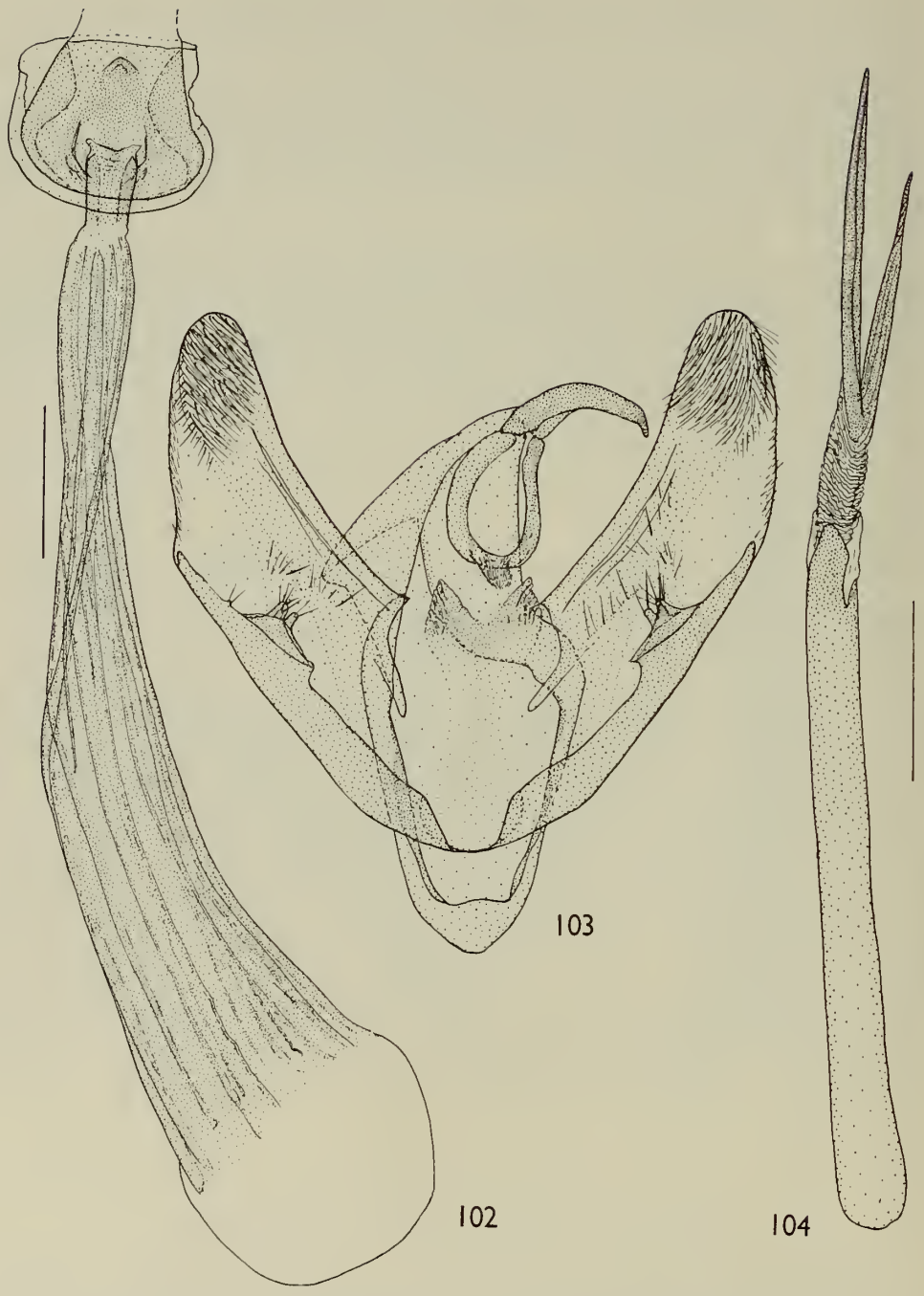
Material examined. Holotype ♂. Guinea : Tondon, ii.1956 (*Mme. M. L. de Toulgoet*), genitalia slide No. C.H.4027 in coll. C. Herbulot, Paris.

Sierra Leone : Moyamba (*D. Cator*), 1 ♀. Ivory Coast : 2 ♂, 2 ♀ ; Bingerville, 1915 (*G. Melou*), 1 ♂, 1 ♀ ; Agboville, 1–8.vi.1915 (*G. Melou*), 1 ♀. Ghana : Bibianaha [Bibiani], 70 miles N.W. of Dimkwa, 700 ft., 19.x.1910 (*H. G. F. Spurrell*), 1 ♀ ; ibid., 28.i.1912, 1 ♀ ; Coomassie [Kumasi], ii–iii.1923 (*N. E. Bell*), 1 ♂, 1 ♀ ; Enchi (*Capt. B. D. Peake*), 1 ♀ ; Manso, N.E. of Cape Coast, iii–iv.1922 (*N. E. Bell*), 1 ♂. Nigeria : Lagos 1 ♂ ; Ilesha (*L. E. H. Humfrey*), 1 ♀ ; Old Calabar (*F. C. Pudney*), 1 ♀. Fernando Po : (*W. Cooper*), 1 ♂. Cameroun : xi. (*G. Schwab*), 1 ♀ ; Johann-Albrechts Höhe, 1898 (*L. Conradt*), 1 ♀ ; Bitji, Ja River, 2000 ft., wet season, iv–v.1909 (*G. L. Bates*), 1 ♂ ; ibid., ix–xi.1911, 1 ♂. Gabon : Lastourville (*P. C. Rougeot*), 1 ♂. Angola : Quicolungo, 120 km. W. of Lucala, 800 m., iv.1936 (*R. Braun*), 1 ♂. Congo (Leopoldville) : Eala, ix.1936 (*J. Ghesquière*), 1 ♀ in Musée Royal de l'Afrique Centrale. Dungu, Upper Uele distr., iv, 1 ♂ ; Middle Lowa Valley, Nr. Walikali, 3000–4000 ft., forest, ii.1924, wet season (*T. A. Barns*), 1 ♂. Burundi : Usumbura, 900 m., 8.xii.1961 (*Dr. M. Fontaine*), 1 ♂.

Cleora rostella sp. n.

(Text-figs. 102–104; Pl. 10, figs. 313–319; Map 5)

♂. Head and thorax white, irrorate with drab, patagia edged with fuscous. Abdomen : first segment white, second segment fuscous, remaining segments white, lightly irrorate with drab, posterior margin of each segment with a pair of fuscous spots medio-dorsally. Wings



FIGS. 102–104. *C. rostella* genitalia. 102, ♀ ; 103, ♂ ; 104, aedeagus.

white, irrorate with drab and fuscous and, distad of postmedial fasciae, with pale smoke grey ; transverse fasciae fuscous ; some warm buff irroration proximad of antemedial fascia on fore wing and distad of postmedial fascia on each wing, well-defined on fore wing between veins M_1 and M_3 ; cubital veins and other veins distad of postmedial fasciae interruptedly warm buff ; a lateral fuscous streak between veins M_2 and M_3 on fore wing, extending from postmedial fascia to termen (Pl. 10, fig. 313). Underside white patterned with fuscous (Pl. 10, fig. 314).

♂. Genitalia (Text-figs. 103, 104). Tip of uncus tapered and depressed ; scobinate medial plate of gnathus slender and tapered ; apex of juxta broadly Y-shaped and rugose ; apical process on sacculus short and digitate ; two minute, setose digitate processes arise at mid-valve ; a further similar, but slightly larger process is situate midway between first pair and ventral margin of valve ; apex of aedeagus incised ; vesica with two stout, tapered cornuti fused at base, one one-half and one three-eighths as long as aedeagus.

♀. Pattern similar to that of male, but drab and fuscous irroration of ground colour greatly reduced ; the slender and sharply marked transverse fasciae and the pale smoke grey irroration distad of the postmedial fascia on each wing and the warm buff irroration and fuscous lateral streak in the discal area of the fore wing distad of the postmedial fascia are conspicuous (Pl. 10, figs. 315, 316).

♀. Genitalia (Text-fig. 102). Lamella postvaginalis strongly sclerotized medially ; posterior margin of colliculum sharply defined ; anterior sixth of bursa copulatrix dilate and membranous, remainder cylindrical, ribbed and sclerotized.

Measurements. ♂ 36–42 mm. ; ♀ 44–49 mm.

In addition to the most common form described as the typical, this polymorphic species displays a range of forms similar to those found in *tulbaghata ;* forms occur in which the antemedial fascia on the fore wing and postmedial fascia on each wing are broad and heavily marked (Pl. 10, fig. 317) ; in another form the proximal third of the fore wing and the distal third of each wing are densely fuscous (Pl. 10, figs. 318, 319) ; forms comparable with *tulbaghata* abs. *flavipleta* and *fumata* also occur.

In the typical form the pale smoke grey irroration distad of the postmedial fascia on each wing, the warm buff irroration and the fuscous lateral streak in the discal area distad of the postmedial fascia on the fore wing are distinctive. In the male genitalia the depressed tip of the uncus, the rugose juxta, the structure of the sacculus and the incised tip of the aedeagus and in the female the shape and development of the sterigma are diagnostic.

Distribution (Map 5). Rhodesia ; Malawi ; Tanzania ; Uganda ; Sudan ; Congo (Brazzaville) ; Burundi ; Congo (Leopoldville) ; Angola.

Holotype ♂. [Malawi] Nyasaland : Limbe, ix–x.1926 (*H. Barlow*), genitalia slide Geometridae No. 2336.

Paratypes : S. Rhodesia : Chirundu, on Zambesi, 22.ii.1950 (*N. Mitton*), 2 ♂ in Transvaal Museum : Salisbury, 17.iv.1916, 1 ♂ in National Museum of Rhodesia. [Zambia] N. Rhodesia : N'kana (*L. Ellison*), 1 ♂ ; Chisorwe [14°52″S. 29°05″E.], Luano Valley, 11.ii.1928 (*M. Burr*), 1 ♂ ; Mpeta, Loangwa R., aff. of Zambesi, xi–xii.1895, beginning of rainy season (*Coryndon*), 3 ♂. [Malawi] Nyasaland : Zomba, 3000 ft., iv.1913 (*E. Ballard*), 1 ♂ ; Zomba, vi.1923 (*H. Barlow*), 1 ♀ ; Mlanje ii.1925 (*H. Barlow*), 1 ♂ ; Magunda Estate, Luchenza (*F. Nisbet*), 1 ♀. [Tanzania] Tanganyika : Old Shinyanga, 29.i.1954 (*E. Burtt*), 1 ♀. Uganda : Kampala, 15.ii.1932 (*H. Hargreaves*), 1 ♂. Sudan : Tambura, Southern Bahr-el-Ghazal, 4 ♂.

[Congo (Brazzaville)] Congo Republic : Fort Crampel, 2 ♂. Burundi : Usumbura, 900 m., 6–7.vii.1961 (*Dr. M. Fontaine*), 2 ♂, 1 ♀ ; ibid., 13.viii.1961, 1 ♀ ; ibid., 1.xi.1961, 1 ♂ ; ibid., 11.xii.1961, 1 ♂ ; ibid., 31.xii.1961, 1 ♂ ; ibid., 7–10.i. 1962, 1 ♂, 1 ♀ ; Kitega, 5.v.1962 (*Dr. M. Fontaine*), 1 ♀, all in Musée Royal de l'Afrique Centrale. [Congo (Leopoldville)] Belgian Congo : Region de M'Pala (*R. P. Guilleme*), 1 ♀ ; E. Lake Kivu, ix.1919 (*T. A. Barns*), 1 ♀ ; 150–200 miles W. of Kambove, 3500–4500 ft., 29.x.1907 (*S. A. Neave*), 1 ♂ ; Katanga Distr., Kafakumba, i.1927, 1 ♂ ; S.E. Katanga, 4000 ft., 24.xi.1907 (*S. A. Neave*), 1 ♂, all in British Museum (Natural History) ; Elisabethville, 26.ix.1932 (*Ch. Seydel*), 1 ♂ ; ibid., 27.x.1937, 1 ♂ ; ibid., 16.xi.1940, 1 ♀ ; ibid., x.1948, 1 ♂, 2 ♀ ; ibid., 20.xi.1949, 1 ♀ ; ibid., 9.iv.1950, 1 ♀ ; ibid., 15.i.1951, 1 ♀, all in Musée Royal de l'Afrique Centrale ; Elisabethville, 23.x.1951 (*Ch. Seydel*), 1 ♂ ; ibid., 24–29.xi.1951, 1 ♂, 1 ♀ ; ibid., 23.xii.1953, 1 ♀ ; ibid., 14.xii.1954, 1 ♀ ; ibid., 7.i.1956, 1 ♂ ; ibid., 25.i.1956, 1 ♀ ; ibid, 2.xi.1956, 1 ♀ ; ibid., 22.xii.1956, 1 ♂ ; ibid., 1.i.1957, 1 ♂ ; ibid., 28.i.1957, 1 ♀, all in British Museum (Natural History) ; Elisabethville, r.Lubumbashi, 11–24.vi.1914 (*Overlaet*), 1 ♂, 1 ♀ ; Lubumbashi, xi.1926 (*Ch. Seydel*), 1 ♂ ; Katanga, Muteba, xii.1922 (*Ch. Seydel*), 1 ♂ ; Katanga, Luashi, 1933 (*Freyne*), 2 ♂ ; ibid., 1935, 1 ♂ ; Katanga, Luashi, 3.vii.1924 (*Ch. Seydel*), 2 ♂ ; Lulua, Kapanga, 13–14.xi.1932 (*F. G Overlaet*), 4 ♂ ; ibid., i.1933, 1 ♂ ; ibid., viii.1933, 1 ♂ ; Lulua, Sandoa, iv.1932 (*F. G. Overlaet*), 1 ♂, all in Musée Royal de l'Afrique Centrale ; Kasai, Lusambo, 3–10. ix.1919, 1 ♂, 1 ♀ ; Upper Kasai Distr. (*P. Landbeck*), 1 ♂, all in British Museum (Natural History) ; Kasai, Luluabourg, 12.vi.1952 (*Dr. M. Fontaine*), 1 ♀ ; ibid., 6.vi.1953, 1 ♂ ; Luluabourg, 24.x.1921 (*Verlaine*), 1 ♂ ; Lusambo, 8.i.1926 (*Ch. Seydel*), 2 ♂ ; Sankuru, Katako-Kombe, 15.xi.1951 (*Dr. M. Fontaine*), 1 ♂ ; Sankuru, Dimbelenge, 19.v.1953 (*Dr. M. Fontaine*), 1 ♂ ; Kilo 300 de Kindu (*Dr. Russo*), 1 ♂ ; Kilo 345 de Kindu (*Dr. Russo*), 1 ♂ ; Leopoldville, 12.viii.1953 (*P. Jobels*), 1 ♀ ; ibid., 6.xii.1955, 1 ♂ ; Leopoldville, 29.xi.1953 (*Dr. M. Fontaine*), 1 ♂, all in Musée Royal de l'Afrique Centrale ; Upper Uele distr., Dungu, ix, 1 ♂ in British Museum (Natural History). Angola : Gamba, Bihé, xii.1934 (*R. Braun*), 7 ♂ ; ibid., i.1935, 3 ♂ ; Talala, Benguella, 1 xii.1905 (*Dr. Ansorge*), 1 ♂.

Cleora legrasi (Herbulot) **comb. n.**

(Text-figs. 105–107 ; Pl. 11, figs. 325–329 ; Map 5)

Neocleora legrasi Herbulot, 1955 : 40, fig. 2.

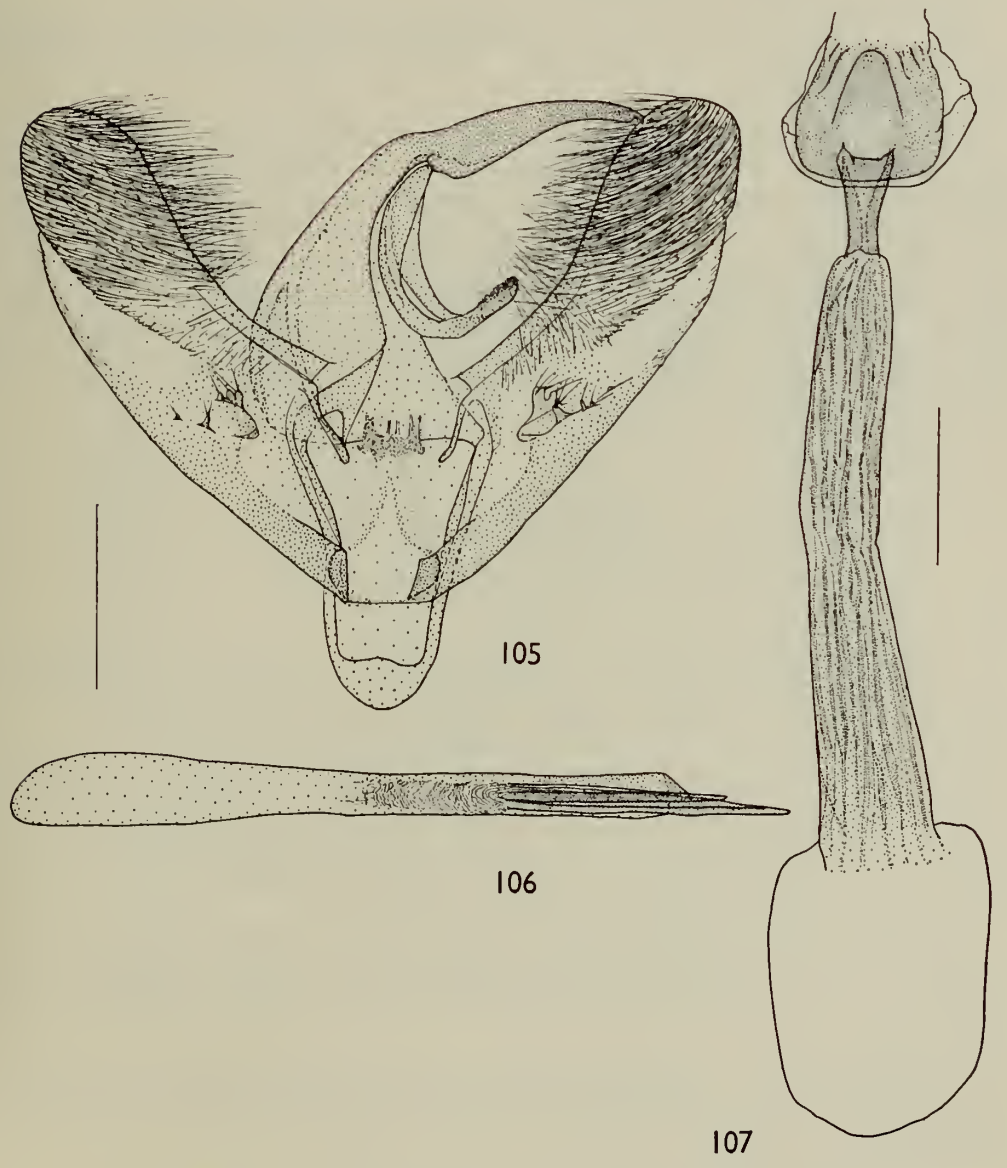
♂. Genitalia (Text-figs. 105, 106). Uncus very slightly curved and tapered with a hooked tip ; scobinate medial plate of gnathus slender and produced ventrad ; apex of juxta rugose ; cucullus and apical two-thirds of dorsal margin of valve densely clothed with very long setae extending well beyond dorsal margin of valve ; sacculus without ventral process ; two or three short, setose, digitate processes arise at mid-valve ; two or three similar, but smaller processes are situated midway between first series and ventral margin ; vesica with two, stout, tapered cornuti fused at base, one three-sevenths as long and one one-third as long as aedeagus.

♀. Genitalia (Text-fig. 107). Lamella postvaginalis heavily sclerotized medially in a sharply defined, semi-ovate pattern ; anterior third of bursa copulatrix dilate and membranous, remainder ribbed and weakly sclerotized.

Measurements : ♂ 34–44 mm. ; ♀ 38–44 mm.

Superficially *legrasi* is closely similar to *acaciaria*, as Herbulot pointed out in his original description ; little variation is shown among the series in the British Museum (Natural History) ; seven specimens in a series of 148 are suffused with fuscous (Pl. 11, fig. 329) and comparable with *tulbaghata* ab. *fumata*, two are similar to *tulbaghata* ab. *flavipleta*, and one combines the features of both.

The hooked tip to the uncus, the rugose juxta and the development of the sacculus



FIGS. 105–107. *C. legrasi* genitalia. 105, ♂ ; 106, aedeagus ; 107, ♀.

reduced to short, setose, digitate processes in the male genitalia and the shape of the bursa copulatrix and development of the sterigma in the female genitalia relate *legrasi* closely to the preceding species, *rostella*. The straighter uncus, the very long setae on the cucullus, the lack of a process on the ventral margin of the sacculus in the male genitalia and the pattern of sclerotization of the sterigma in the female genitalia are diagnostic.

Distribution (Map 5). Madagascar.

Material examined. Holotype ♂. MADAGASCAR centre, Tananarive, Parc de Tsimbazaza, alt. 1200 m., 3.ii.1952 (*P. Viette*), in Muséum national d'Histoire naturelle, Paris.

MADAGASCAR : Diego Suarez, ii,iii,iv,vii.1917 (*G. Melou*), 9 ♂, 1 ♀ ; N.E. Madagascar, base de la montagne Tsaratanana (ex *Lamberton*, 1923), 1 ♂ ; E. Madagascar, Marcantsetra, 2 ♂ ; Central Madagascar, 2500 ft. (*F. B. Pratt*), 2 ♂, 1 ♀ ; Tananarive, 1 ♀ ; Station Perinet, 149 km. east of Tananarive, i,ii,iii,x,xi,xii (*N. & G. Olsoufieff*), 78 ♂, 18 ♀ ; Ambinanindrano, 50 km. west of Mahonoro, i,v (*G. K. Kendall-Cornish*), 2 ♂, 1 ♀ ; Mananjary, 1918 (*G. Melou*), 8 ♂, 1 ♀ ; Mananjara, xi.1918, 4 ♂ ; Ankarampotsy, near Fianarantsoa, col. de Tantamaly, xii.1933–i.1934 (*R. Catala*), 5 ♂, 1 ♀ ; Betsileo, 3000–4000 ft., 1881 (*Deans Cowan*), 1 ♂ ; S. Madagascar (*Me. Lamberton*), 2 ♂.

Cleora angustivalvis (Herbulot) **comb. n.**

(Text-figs. 108–110 ; Pl. 10, figs. 321–324 ; Map 5)

Neocleora angustivalvis Herbulot, 1965 : 121.

♂. First abdominal segment white, remainder of vestiture white, irrorate with bister ; patagia edged with bister. Wings white, irrorate with drab and bister and patterned with bister (Pl. 10, fig. 321). Underside white, patterned with fuscous (Pl. 10, fig. 322).

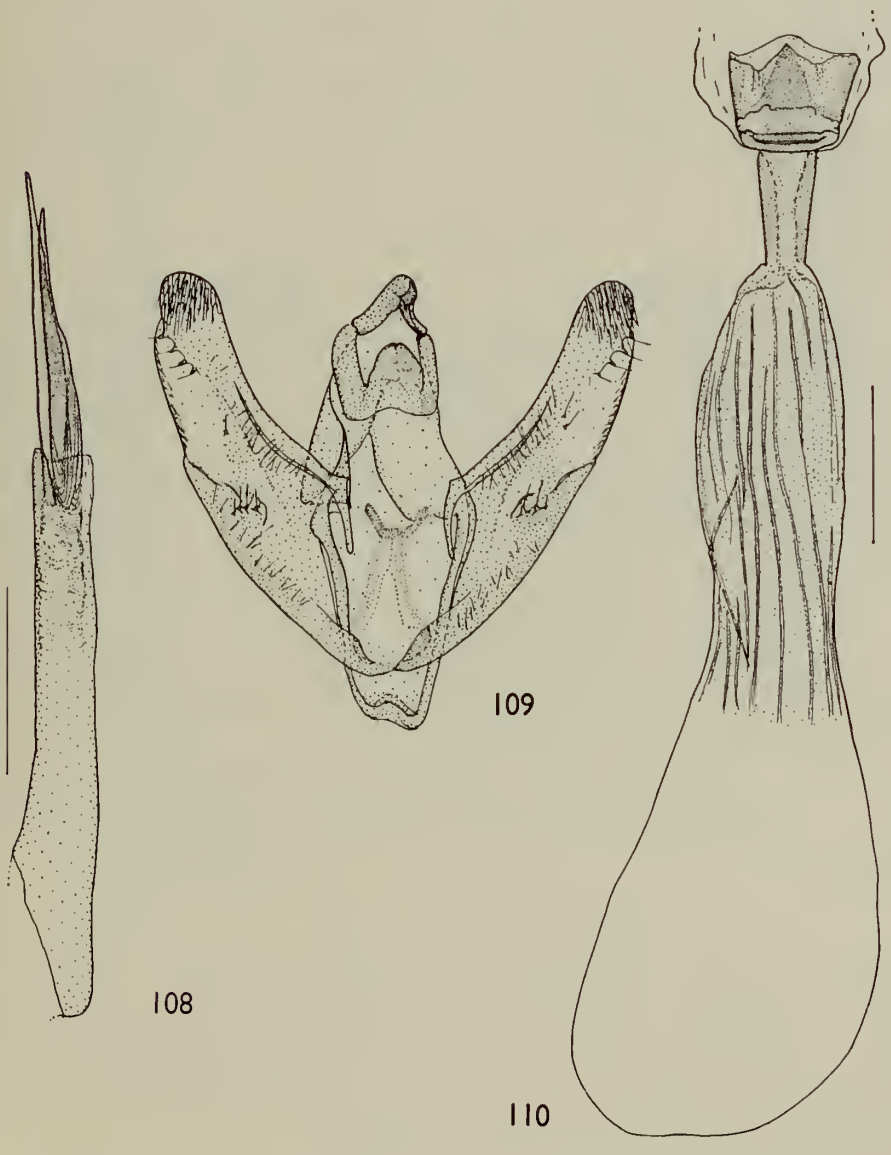
♂. Genitalia (Text-figs. 108, 109). Uncus stout and blunt to tip, which is slender and depressed ; scobinate medial plate of gnathus narrowly rounded and produced ventrad ; apex of juxta Y-shaped, smoothly sclerotized ; cucullus with normal short setae, ventral edge with four setose, tubercle-like projections ; sacculus weakly developed and without projecting process ; short, setose, digitate processes arise near mid-valve, two on right valve, four on left valve, but probably varying in number individually, vesica with two tapered cornuti fused at base, one one-half and one slightly longer than one-half as long as aedeagus.

♀. Differs from male in sparse irroration and more conspicuous patches of bister distad of postmedial fascia on fore wing, the larger extending from costa to vein M_1, the smaller between veins M_2 and Cu_1 ; veins on both wings interruptedly warm buff distad of postmedial fascia (Pl. 10, fig. 323). Underside differs in the reduction of fuscous pattern, especially on hind wing (Pl. 10, fig. 324).

♀. Genitalia (Text-fig. 110). Sterigma weakly developed ; lamella postvaginalis sclerotized in mitre-shaped pattern ; colliculum tapering anteriorly, three times as long as mean width ; slightly more than posterior half of bursa copulatrix weakly sclerotized and ribbed, remainder membranous.

Measurements : ♂ 35 mm. ; ♀ 38–44 mm.

The structure of the uncus and of the sacculus indicate a close affinity with the two preceding species, *rostella* and *legrasi*. Externally the male is similar to a small pale form of *acaciaria*, but distinguished from it by the less heavily patterned underside of the wings ; the female is distinct in the bister patterning of the fore wing distad of the postmedial fascia and in the very lightly marked underside of the hind wing.



FIGS. 108–110. *C. angustivalvis* genitalia. 108, aedeagus ; 109, ♂ ; 110, ♀.

The species is distinguished externally from both *rothkirchi insularum* and *transversaria*, the other species of *Cleora* occurring in the Comoro Islands, by its larger size ; in the male the much sparser brown irroration gives *angustivalvis* a grey appearance by comparison with males of *transversaria* and in the female the pattern of both upper and under surfaces of the wings distinguishes *angustivalvis*.

Structurally the cucullus and the development of the sacculus in the male genitalia and the form of the sterigma and bursa copulatrix in the female genitalia are diagnostic.

Distribution (Map 5). Comoro Islands ; probably endemic.

Material examined. Holotype ♂. Grande Comore, 1884 (*L. Humblot*).

Paratypes : Grande Comore, 2 ♂, 11 ♀ ; ibid., 1894 (*L. Humblot*), 6 ♀ ; Grande Comoro, viii.1911 (*G. F. Leigh*), 1 ♀.

Cleora serena sp. n.

(Text-figs. 111–113 ; Pl. 11, figs. 337–340 ; Map 5)

♂. Vestiture white, lightly irrorate with drab and bister, except for first abdominal segment which is immaculate ; patagia lightly edged with bister. Wings white, irrorate with drab and bister and patterned with bister ; a broken snuff brown band, marked with light buff on veins, situate immediately distad of postmedial fascia on each wing ; proximal half of subterminal fascia on each wing irrorate with pale smoke grey (Pl. 11, fig. 337). Underside white, patterned with fuscous (Pl. 11, fig. 338).

♂. Genitalia (Text-figs. 112, 113). Uncus with short, thorn-like tip ; scobinate medial plate of gnathus semi-circular, little broader than uncus ; juxta broadly Y-shaped at apex ; projection from apex of sacculus minute ; a slightly larger, setose, digitate process at mid-valve, sometimes asymmetrical and bilobate on one side ; vesica with two short, tapered cornuti fused at base ; one one-half as long and one two-fifths as long as aedeagus.

♀. Similar to male, but drab and bister irroration much reduced, allowing a sharper definition of pattern, especially of the broad, snuff brown band marked with light buff on the veins, situate just distad of the postmedial fascia on the upperside of each wing ; pale smoke grey irroration on subterminal fascia well defined and extending to termen in discal area on fore wing and in distal half of hind wing (Pl. 11, figs. 339, 340).

♀. Genitalia (Text-fig. 111). Lamella postvaginalis bell-shaped ; lamella antevaginalis consisting of a strongly sclerotized lateral band ; colliculum of even width, twice as long as broad ; anterior two-ninths of bursa copulatrix membranous and globular with a slight, bulbous projection, remainder cylindrical, sclerotized and ribbed, the ribbing extending very weakly into membranous part.

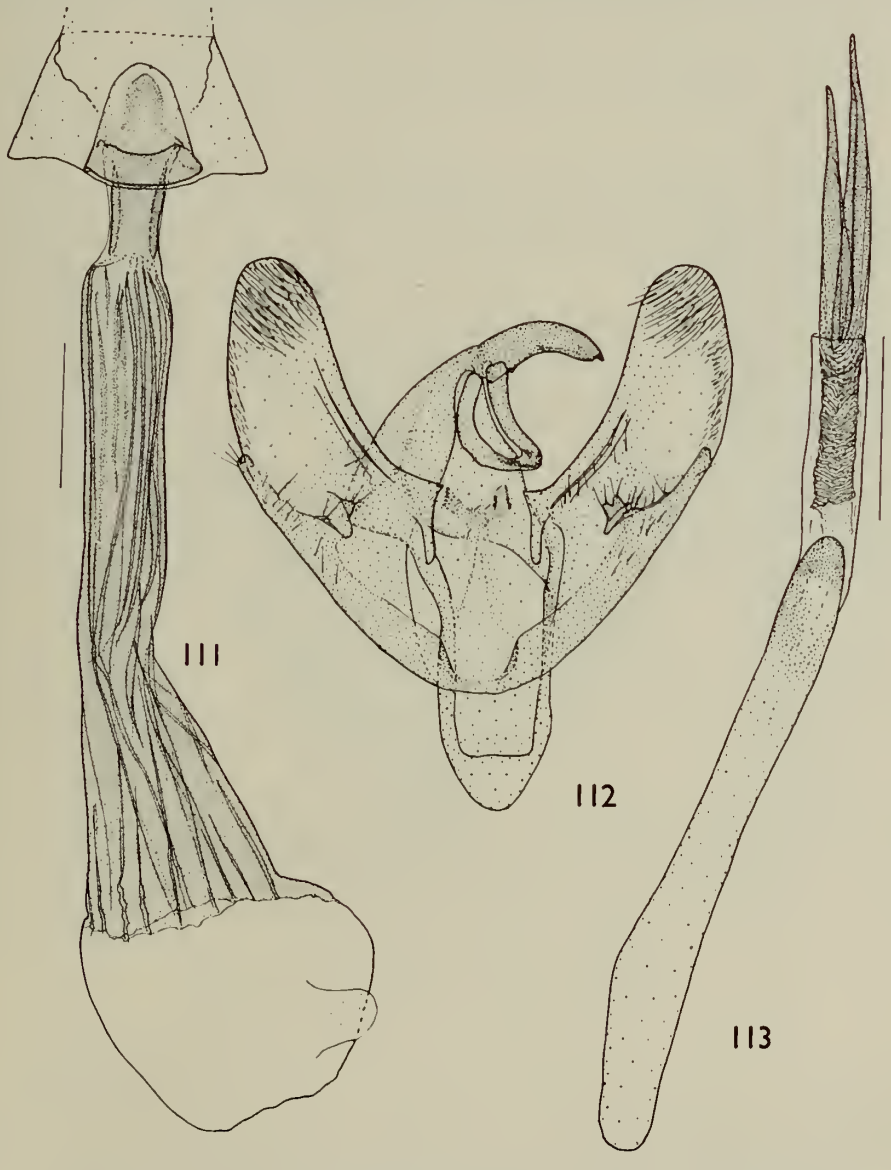
Measurements. ♂ 34–38 mm. ; ♀ 34–44 mm.

The pattern of the type series is uniformly marked, similar to that of *angustivalvis* from the Comoro Islands, to which *serena* is also closely related in structure of the genitalia of both sexes. Related closely also in these structures to *rostella*, with which it is probably sympatric in Angola. Externally the broad snuff brown band distad of the postmedial fascia on each wing, well defined in the female, is distinctive ; structurally the development of the sacculus in the male genitalia and the sterigma and colliculum in the female genitalia are diagnostic.

Distribution (Map 5). Congo ; Angola.

Holotype ♂. ANGOLA : Fazenda Congulu, Amboim district, 7–800 m., 17–22.iv. 1934 (*Dr. K. Jordan*), genitalia slide Geometridae No. 2274.

Paratypes : type locality, 7–11.iv.1934, 1 ♂, 6 ♀ ; ibid., 12–16.iv.1934, 1 ♂, 1 ♀ ; ibid., 17–22.iv.1934, 1 ♂, 1 ♀ ; Quirimbo, 75 km. E. of P. Amboim, 300 m., 7–12.v. 1934 (*Dr. K. Jordan*), 1 ♂, 11 ♀ ; N'Dalla Tando, 2700 ft., 21.xi.1908 (*Dr. W. J. Ansorge*), 1 ♀. CONGO : 1 ♀.



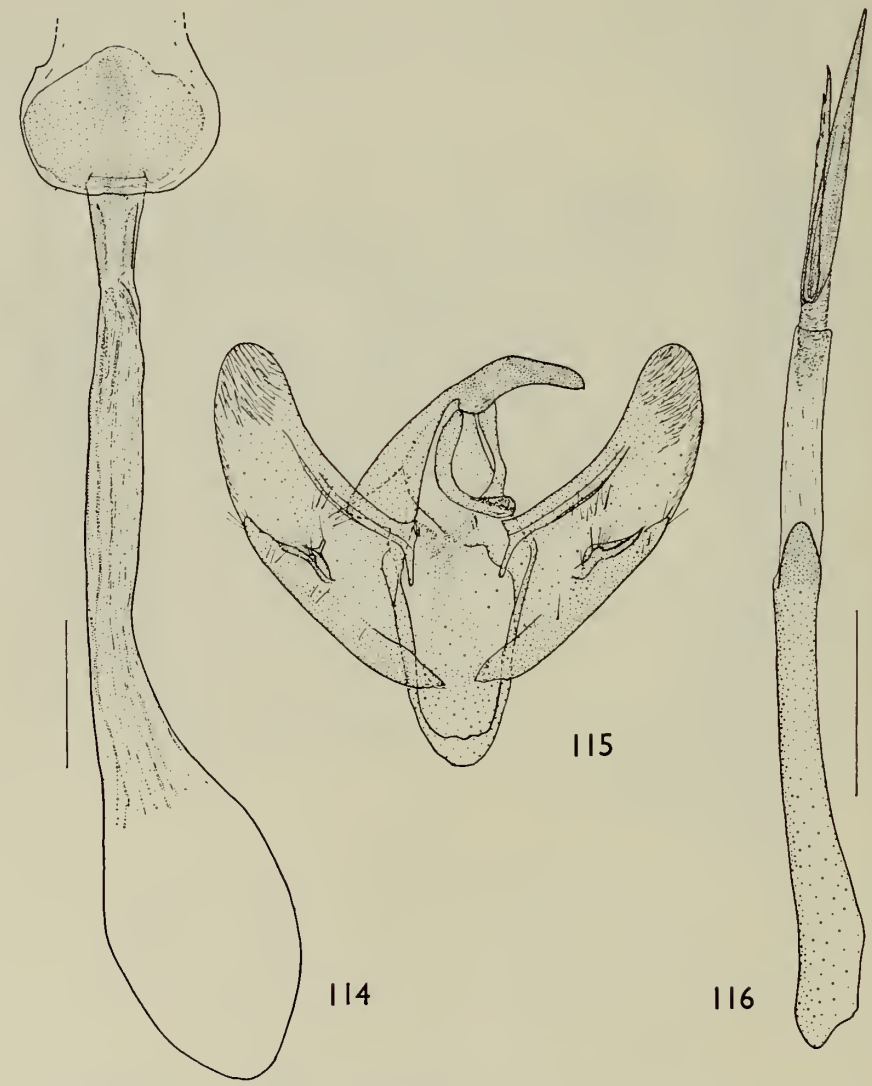
FIGS. 111–113. *C. serena* genitalia. 111, ♀ ; 112, ♂ ; 113, aedeagus.

Cleora oligodranes (Prout) **comb. n.**

(Text-figs. 114–116 ; Pl. 11, figs. 341–344 ; Map 5)

Chogada oligodranes Prout, 1922 : 358.
Neocleora oligodranes (Prout) Janse, 1932 : 271, pl. 8 : 8 ; text-fig. 100.

♂. Vestiture : first abdominal segment white, remainder pinkish cinnamon, irrorate with fuscous. Wings pinkish cinnamon, irrorate and patterned with fuscous (Pl. 11, fig. 341). Under surface of wings tilleul buff evenly, but very sparsely irrorate and patterned with fuscous (Pl. 11, fig. 342).



FIGS. 114–116. *C. oligodranes* genitalia. 114, ♀ ; 115, ♂ ; 116, aedeagus.

♂. Genitalia (Text-figs. 115, 116). Uncus with minute thorn-like tip ; scobinate medial plate of gnathus about two-thirds as wide as cucullus ; apex of juxta broadly Y-shaped ; sacculus setose at apex, sometimes minutely produced ; a slender, setose, digitate process at mid-valve, longer on left valve than right, and another shorter one, midway between first and ventral margin ; vesica with two tapered cornuti fused at base, one three-fifths as long, and one one-half as long as aedeagus, the shorter cornutus sparsely spined along one side.

♀. Differs from male in the vinaceous buff ground colour of the wings and in reduction of the fuscous irroration ; a broad snuff brown fascia is situated proximad of the antemedial fascia on the fore wing and a similar fascia is situated distad of the postmedial fascia on each wing (Pl. 11, fig. 343). Underside differs in the greyer ground colour of the wings and less well defined pattern (Pl. 11, fig. 344).

♀. Genitalia (Text-fig. 114). Lamella postvaginalis almost circular, weakly sclerotized except medially ; anterior fourth of bursa copulatrix membranous, remainder cylindrical, ribbed and very weakly sclerotized.

Measurements. ♂ 32–37 mm. ; ♀ 35–41 mm.

Externally variable in degree of development of transverse fascia. Variable also in neuration ; in the fore wings of six of the 15 examples studied Sc_1 and Sc_2 are stalked ; in a further example they are coincident, and in two other examples Sc_2 anastomoses with the stalk of Sc_{3-5}.

The genitalia of both sexes also show a degree of variation. In the male of the type series the short digitate processes at mid-valve are asymmetrical in two examples and absent in a third, they are absent also from a Vredendal specimen. In the female from Ceres the medial sclerotized area of the lamella postvaginalis is tapered posteriorly.

Externally similar to some forms of *quadrimaculata*, but distinguished by the lightly marked under surface of the wings. Structurally the male genitalia indicate a close affinity with *angustivalvis* and *serena*, but are distinguished by the scobinate, shorter cornutus on the vesica. In the female genitalia the weakly sclerotized sterigma is diagnostic.

Distribution (Map 5). Orange Free State ; Bechuanaland ; Cape Province.

Material examined. Holotype ♂. [Orange Free State] : Thaba'nchu, i.1915 (*G. Edelston*), genitalia slide Geometridae No. 2138.

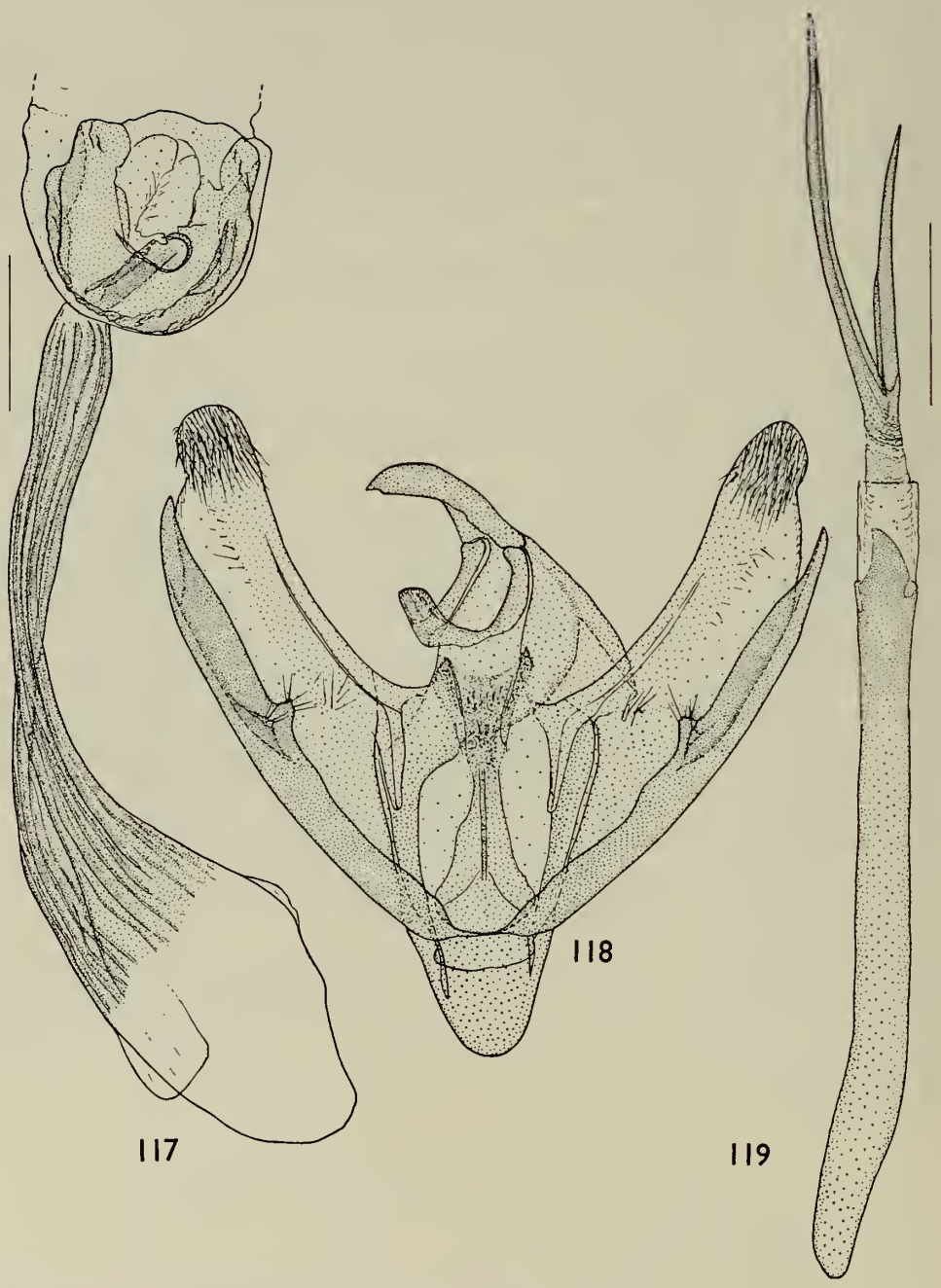
Orange Free State : type data, 6 ♂, 1 ♀. Bechuanaland : Upington, 14.iii. 1950 (*H. B. Kettlewell*), 1 ♀. Cape Province : Vredendal, 23–30.vii.1927 (*G. van Son*), 1 ♂, 1 ♀ ; Karoo, Richmond, 16.iv.1949 (*H. B. D. Kettlewell*), 1 ♂ ; Ceres, ii.1925 (*R. E. Turner*), 1 ♀ ; Kokstad, 27.iii.1952 (*C. G. C. Dickson*), 1 ♂, 1 ♀ in Transvaal Museum ; Pondoland, Port St. Johns, 7–13.viii.1923, 1 ♂.

Cleora macracantha (Herbulot) **comb. n.**

(Text-figs. 117–119 ; Pl. 11, figs. 330–334 ; Map 5)

Neocleora macracantha Herbulot, 1959 : 39, fig. 1.

♂. First abdominal segment white ; remainder of vestiture white, irrorate with snuff brown and bister ; patagia edged with bister ; posterior margins of abdominal segments, except first edged dorsally with bister, sometimes as paired spots. Wings white, irrorate with pinkish buff, snuff brown and bister and patterned with bister ; antemedial fascia of fore wing and postmedial



FIGS. 117–119. *C. macracantha* genitalia. 117, ♀; 118, ♂; 119, aedeagus.

fascia of each wing sharply defined ; discal spots heavily ringed with bister ; a broad, ill-defined band of pinkish buff to cinnamon brown proximad of antemedial fascia on fore wing and a similar band distad of postmedial fascia on each wing ; cubital veins and other veins distad of postmedial fasciae interruptedly light buff (Pl. 11, fig. 330). Underside of wings white, heavily patterned with fuscous (Pl. 11, fig. 331).

♂. Genitalia (Text-figs. 118, 119). Uncus short and stout with a thorn-like tip ; scobinate medial plate of gnathus of even width and rounded at tip ; apex of juxta broadly Y-shaped and rugose ; sacculus strongly sclerotized, fused with and extending to three-fourths ventral margin of valve then extending to a tapered tip, level with seven-eighths ventral margin ; a short, setose, digitate process at mid-sacculus and two similar but minute processes nearer mid-valve; aedeagus long and slender, one and one-half times as long as sacculus ; vesica with two stout tapered cornuti fused at base, one one-half as long, the other slightly less than one-half as long as aedeagus.

♀. Similar to male, but upperside of wings usually less densely irrorate (Pl. 11, figs. 333, 334).

♀. Genitalia (Text-fig. 117). Sterigma asymmetrical and contorted ; posterior medial area weakly sclerotized ; anterior fourth of bursa copulatrix membranous with two small projections; remainder of bursa ribbed and sclerotized.

Measurements. ♂ 30–40 mm. ; ♀ 39–50 mm.

Variation in pattern similar to that of *legrasi ;* among a series of 160 specimens are nine examples (Pl. 11, fig. 332) comparable with *tulbaghata* ab. *fumata*, one male has the band distad of the postmedial fascia and the posterior half of the fore wing, except terminal sixth, suffused with warm buff and one female combines the characters of both forms. Distinguished externally from other known Madagascan species of *Cleora* by the clear white ground colour and sharply contrasted and heavily marked pattern on the underside of the wings. In the male genitalia the development of the sacculus and in the female genitalia the asymmetrical sterigma are diagnostic.

The strongly developed, rugose juxta, the development of the sacculus and the long smooth cornuti indicate a close affinity with *rostella ;* the asymmetrical sterigma, however, remains a unique curiosity in the genus.

Distribution (Map 5). Madagascar ; endemic.

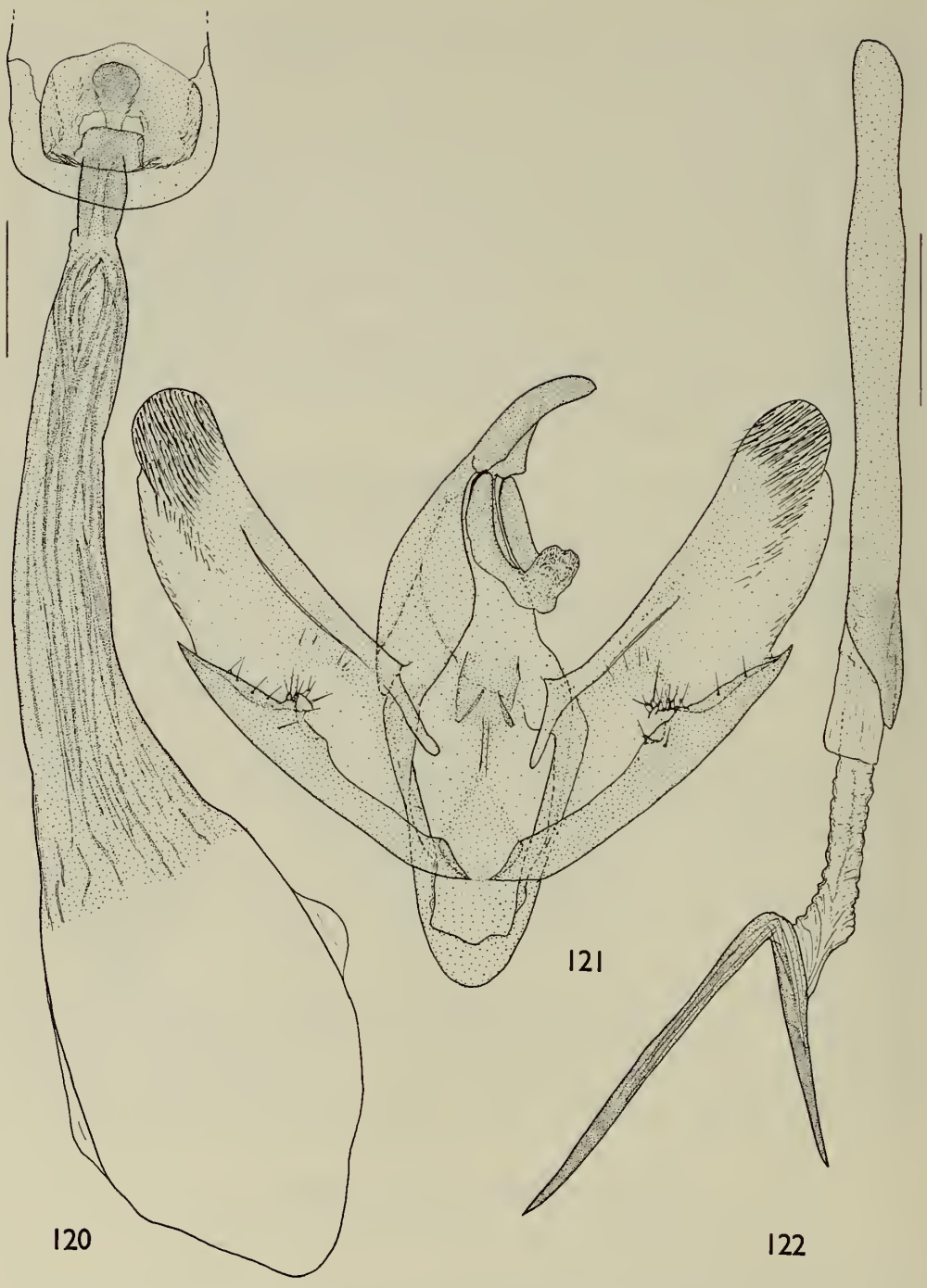
Material examined. Holotype ♂. MADAGASCAR centre, Tananarive, Parc de Tsimbazaza, alt. 1200 m., 2.ii.1952 (*P. Viette*), in Muséum national d'Histoire naturelle, Paris.

MADAGASCAR : Diego Suarez, ii–ix. (*G. Melou*), 52 ♂, 32 ♀ ; Kulau (*G. Melou*), 2 ♂ ; Tamatave et forêts d'Alahakato (*Edouard Perrot*), 1 ♂ ; Imarina, 1892 (*R. P. Camboué*), 1 ♂ ; Ambinanindrano, 50 km. W of Mahonoro, iii,v,viii,x,xii (*G. K. Kestell-Cornish*), 5 ♂, 3 ♀ ; Tananarive, 1933, 1 ♂ ; Mananjary, 1918 (*G. Melou*), 12 ♂, 8 ♀ ; Mananjara, xi.1918, 37 ♂, 4 ♀ ; S. Madagascar, iv.1922 (*Lamberton*), 1 ♀.

Cleora derogaria (Snellen) **comb. n.**

(Text-figs. 120–122 ; Pl. 12, figs. 345–348 ; Map 5)

Boarmia derogaria Snellen, 1872 : 73, pl. 6 : 36.
Boarmia obsitaria Mabille, 1890 : 47. **Syn.n.**
Chogada acaciaria sensu Warren, 1898 : 248.



FIGS. 120–122. *C. derogaria* genitalia. 120, ♀ ; 121, ♂ ; 122, aedeagus.

Chogada acaciaria ab. *inusitata* Warren, 1898 : 248. **Syn.n.**
Chogada subspurcata Warren, 1898 : 248.
Boarmia derogaria Snellen ; Swinhoe, 1904 : 532 [synonymy].

♂. First abdominal segment white ; remainder of vestiture buffy brown, irrorate with bister. Wings buffy brown, irrorate and patterned rather obscurely with bister (Pl. 12, fig. 345). Underside of wings tilleul buff densely suffused and heavily patterned with fuscous (Pl. 12, fig. 346).

♂. Genitalia (Text-figs. 121, 122). Uncus stout with a minute thorn-like tip ; scobinate medial plate of gnathus almost rectangular, one-half as broad as cucullus ; apex of juxta rugose ; apex of sacculus, triangular in section with one ridge setose, extends to about two-thirds ventral margin of valve ; a cluster of minute setose, digitate processes at mid-valve varying in number from four to six ; vesica with two stout, tapered cornuti fused at base, one two-fifths and one three-fifths as long as aedeagus.

♀. Lighter in colour and with better defined pattern than male, ground colour of vestiture and upperside of wings tilleul buff (Pl. 12, fig. 347). Ground colour of underside of wings white and much less suffused with fuscous than male (Pl. 12, fig. 348).

♀. Genitalia (Text-fig. 120). Lamella postvaginalis with heavily sclerotized medial lobe ; lamella antevaginalis with medial fold fused with colliculum ; anterior two-fifths of bursa copulatrix ovate and membranous with two slight bulbous projections, remainder cylindrical, ribbed and sclerotized.

Measurements. ♂ 35–40 mm. ; ♀ 39–45 mm.

The tone of the ground colour in the male varies from drab in the paler form to buffy brown in darker examples ; the female varies in the extent of the dark irroration. The darker form of the male and the well contrasted paler forms of the female are readily recognisable by their colour and pattern.

The genitalia of both sexes are similar in general pattern to those of *rostella ;* those of the male differ in the shorter, stouter uncus, the broader medial plate of the gnathus, the detail of the apex of the juxta and in the development of the sacculus ; those of the female differ in the detail of the sterigma and in the proportionately longer membranous part of the bursa copulatrix.

Distribution (Map 5). Gambia ; Sierra Leone ; Ivory Coast ; Nigeria ; W. Congo (Leopoldville) ; N. Angola.

Material examined. Holotype ♂ of *Boarmia derogaria* Snellen (without abdomen) : Banana, Afrika, v. Woerden, in Rijksmuseum van Natuurlijke Historie, Leiden.

Lectotype ♂ of *Boarmia obsitaria* Mabille. From two male syntypes I select as LECTOTYPE the specimen labelled : Landana, *Boarmia obsitaria* Mabille, ex. Musaeo P. Mabille 1923. Oberthür Coll. Brit. Mus. 1927–3, genitalia slide Geometridae No. 2135.

Lectotype ♀ of *Chogada subspurcata* Warren. From a series of 5 ♂ and 4 ♀ syntypes I select as LECTOTYPE the female specimen labelled : Warri, ix.1897 (*Dr. Roth*), *Chogada subspurcata* Warren type ♀, Rothschild Bequest B.M. 1939–1.

Holotype ♀ of *Chogada acaciaria* ab. *inusitata* Warren : Warri, vi.1897 (*Dr. Roth*), genitalia slide Geometridae No. 2152.

Gambia (*A. Moloney*), 2 ♂, 3 ♀. Sierra Leone (*C. R. Bartlett*), 1 ♂. Ivory Coast : Bingerville, 1–7.vii.1915 (*G. Melou*), 1 ♂. At Sea : Between Old Calabar and Accra (*G. E. Bergman*), 1 ♀. Nigeria : Warri, iv,vii–ix (*Dr. Roth*), 6 ♂, 6 ♀ ; Degema (*Ansorge*), 3 ♂, 2 ♀ ; Niger Coast, 1 ♀ ; Opobo, 1 ♀ ; Rio del Ray, 12.x.1931 (*D. R. Rosevear*), 1 ♀. N. Angola : Landana, 1 ♂.

Cleora pavlitzkiae (Fletcher) **comb. n.**

(Text-figs. 123–135 ; Pl. 12, figs. 349–362 ; Map 6)

Neocleora pavlitzkiae Fletcher, 1958a : 139, pl. 2 : 8, 10, pl. 4 : 26–28.

♂. Underside of wings white, patterned with fuscous ; postmedial fascia on fore wing usually well defined from two-thirds costa to lower angle of cell ; costa of fore wing tinged with light buff ; specimens in which the upper surface is densely irrorate with fuscous black have the white area of the underside mottled.

Upperside of wings variable in colour and pattern in both sexes.

♂. Genitalia. Uncus evenly stout, apex rounded with a minute thorn-like tip ; scobinate medial plate of gnathus varies geographically in shape and extent of scobination ; apex of juxta broadly Y-shaped, sometimes minutely spiculate or rugose ; sacculus with short apical process projecting at about one-half ventral margin of valve, the shape and extent of the projection varying geographically ; vesica with two stout, tapered cornuti fused at base, varying slightly in proportions, but the larger scobinate on ventral surface from one-fourth to seven-eighths.

♀. Underside of wings white, very sparsely patterned with fuscous ; in examples where the upperside is comparable with *tulbaghata* ab. *fumata* the fuscous patterning of the underside is similar to that of the male.

♀. Genitalia. Sterigma and colliculum vary geographically ; anterior third of bursa copulatrix globular and membranous, sometimes with one or two slight bulbous projections from opposite sides ; remainder of bursa cylindrical, ribbed and sclerotized.

The species may be distinguished externally by the mottled pattern of the underside of the wings in the male and structurally in the male genitalia by the larger of the two cornuti being scobinate on the ventral surface for the greater part of its apical half, only the apex remaining smooth, and in the female genitalia by the proportions and form of the bursa copulatrix.

Subspecies *lamella*, occurring up to an elevation of about 7000 ft. in Kenya and Tanzania, may have had a wider distribution in Africa ; a single male from Musake at 6350 ft. on Mt. Cameroon has male genitalia closely similar to those of *lamella*, differing only in the development of the scobinate medial plate of the gnathus and probably now represents a distinct subspecies ; a male from the Zomba Plateau in Malawi and a male from Tsumeb in the northern part of S.W. Africa are similar. The genitalia of the female from Tsumeb are apparently identical with those of the nominate subspecies.

Three males and a female from between 3700 and 4500 ft. in Central and Western Uganda (Kampala, Entebbe and Kilembe) and in E. Congo (Leopoldville), Mutwanga, are intermediate between subsp. *lamella* and subsp. *saltuensis ;* further material will probably shew them to represent a distinct subspecies.

Distribution (Map 6). S.W. Africa ; Rhodesia ; Malawi ; Tanzania ; Kenya ; Ethiopia ; Uganda ; Burundi ; Rwanda ; E. Congo (Leopoldville) ; Cameroun.

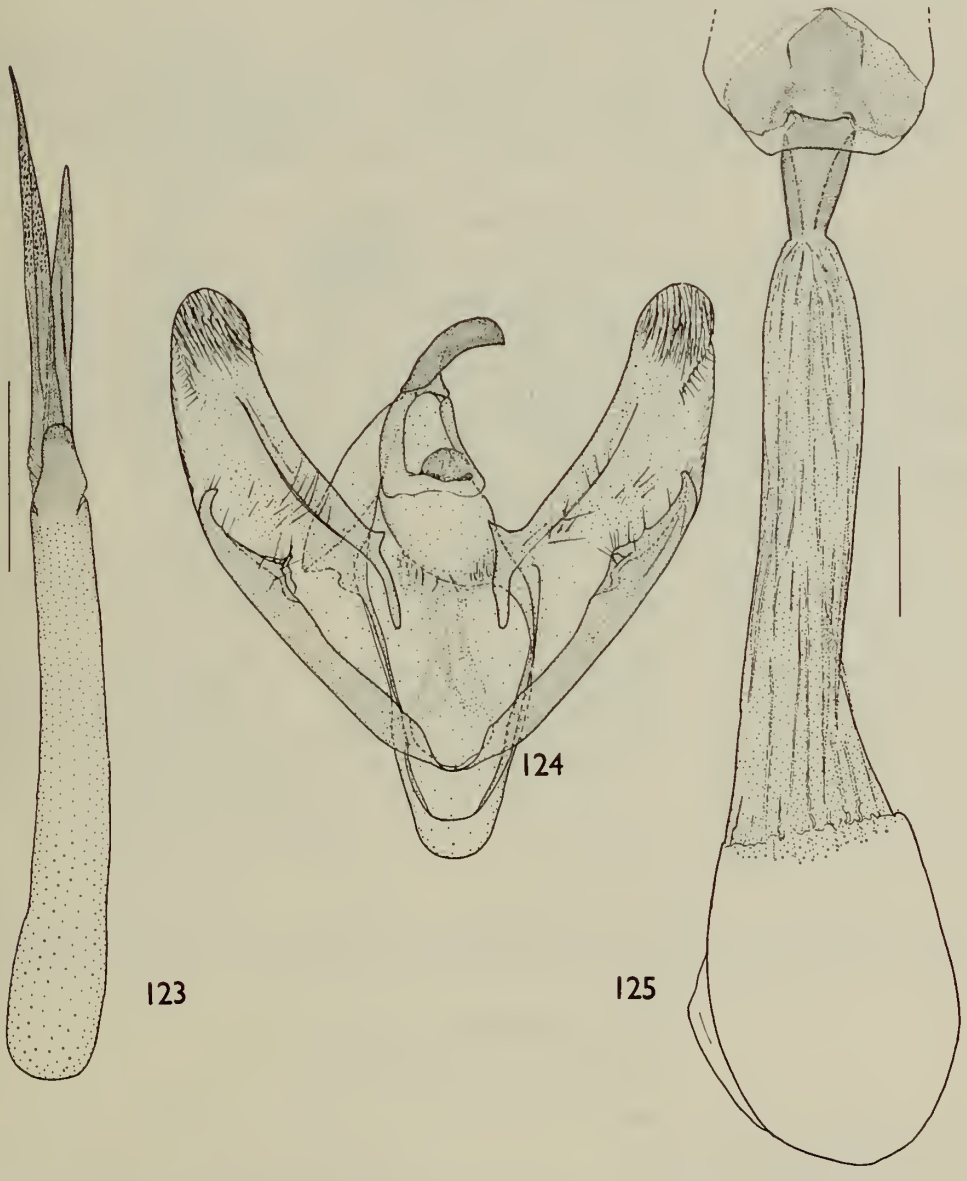
Cleora pavlitzkiae pavlitzkiae (Fletcher)

(Text-figs. 123–125 ; Pl. 12, figs. 349–354 ; Map 6)

♂ ♀. In the nominate subspecies the ground colour of the upper surface of the wings is white, usually weakly irrorate but very rarely with a shade darker than bister (Pl. 12, figs. 349–352) ; forms occur that are comparable with *tulbaghata* ab. *flavipleta* and a variation of the *flavipleta* form has the medial area of the fore wing and the proximal half of the hind wing almost immacu-

late (Pl. 12, fig. 353) ; a female from Vumba has the upper surface of the wings patterned with fuscous black (Pl. 12, fig. 354).

♂. Genitalia (Text-figs. 123, 124). Scobinate medial plate of gnathus semicircular, at base three-fifths as broad as cucullus ; projection of sacculus beyond ventral margin of valve blunt, slightly incurved and setose but not scobinate, two-fifths as long and one-eighth as broad as width of cucullus ; two cornuti, one three-sevenths and one four-sevenths as long as aedeagus.



FIGS. 123–125. *C. pavlitzkiae pavlitzkiae* genitalia. 123, aedeagus ; 124, ♂ ; 125, ♀.

♀. Genitalia (Text-fig. 125). Central area of lamella postvaginalis sclerotized in bell-shaped pattern. Colliculum strongly developed with sharply defined posterior margin ; twice as long as mean width, tapered anteriorly.

Measurements. ♂ 37–45 mm. ; ♀ 41–45 mm.

Distribution (Map 6). Rhodesia ; Malawi.

Material examined. Holotype ♂. S. Rhodesia : Vumba, 7.xi.1936 (*J. E. Drysdale*), genitalia slide Geometridae No. 2171.

S. Rhodesia : Vumba Mts., Umtali, ii,xii, 7 ♂, 1 ♀ and Vumba, 16.iii.1925 (*P.A.S.*), 1 ♂, in National Museum of Rhodesia ; Vumba, ii,xi (*G. van Son*), 2 ♂, 2 ♀ and Mt. Selinda, xii.1935 (*G. van Son*), 2 ♂, in Transvaal Museum ; type data, 4 ♀. Malawi : Port Herald, Nr. Zambezi, vi.1926 (*H. Barlow*), 1 ♂.

Cleora pavlitzkiae lamella ssp. n.

(Text-figs. 126, 127 ; Pl. 12, figs. 355, 356 ; Map 6)

♂ ♀. Wings in most examples patterned and densely irrorate with bister to fuscous black (Pl. 12, figs. 355, 356).

♂. Genitalia (Text-fig. 127). Medial plate of gnathus as in nominate subspecies ; projection of sacculus beyond ventral margin of valve spatulate, straight and setose, three-fifths to four-fifths as long as width of cucullus ; proportions of cornuti as in nominate subspecies.

♀. Genitalia (Text-fig. 126). Similar to those of the nominate subspecies, but with a slightly broader posterior margin to the colliculum.

Measurements. ♂ 38–50 mm. ; ♀ 44–46 mm.

Distribution (Map 6). Kenya ; Tanzania.

Holotype ♂. Kenya : Nanyuki, x.1961 (*R. H. Carcasson*), genitalia slide Geometridae No. 5288.

Paratypes : Kenya : Nairobi, v.1905 (*Jackson*), 1 ♂ ; Nairobi, Ngong, vii.1954 (*Fowler & Coulson*), 1 ♂ ; Mt. Kenya, Naro Moru, 7000 ft., 20.viii.1949 (*J. A. Riley*), 1 ♂ ; Mt. Kenya, Meru Distr., ix.1930 (*Mrs. H. Young*), 1 ♂ ; Between Nanyuki and Meru (*E. Barnes*), 1 ♂ ; Nakuru, bred (*A. L. H. Townsend*), ix.1936, 1 ♂ ; ibid., i.1937, 1 ♂ ; ibid., vii.1937, 1 ♀ ; ibid., ix.1937, 2 ♂ ; ibid., i.1938, 1 ♀ ; ibid., 9.i.1943, 1 ♂ ; ibid., 13.i.1944, 1 ♂ ; Mt. Elgon, i.1953 (*T. H. E. Jackson*), 1 ♂ ; ibid., i.1959, 1 ♂ in Coryndon Museum.

Other material. [Tanzania] Tanganyika : Morogoro, Kibuku, 1 ♀ ; Njombe, 6000–7000 ft., 19.x.1947 (*W. Peters*), 1 ♂ ; ibid., 19.x.1951, 1 ♂ ; Mufindi (*P. Burdon*), 2 ♂, 2 ♀ ; Marangu, 1–20.iii.1959 (*Lindner*), 1 ♂ in Zoological Museum, Stuttgart.

Cleora pavlitzkiae etesiae ssp. n.

(Text-figs. 128–130 ; Map 6)

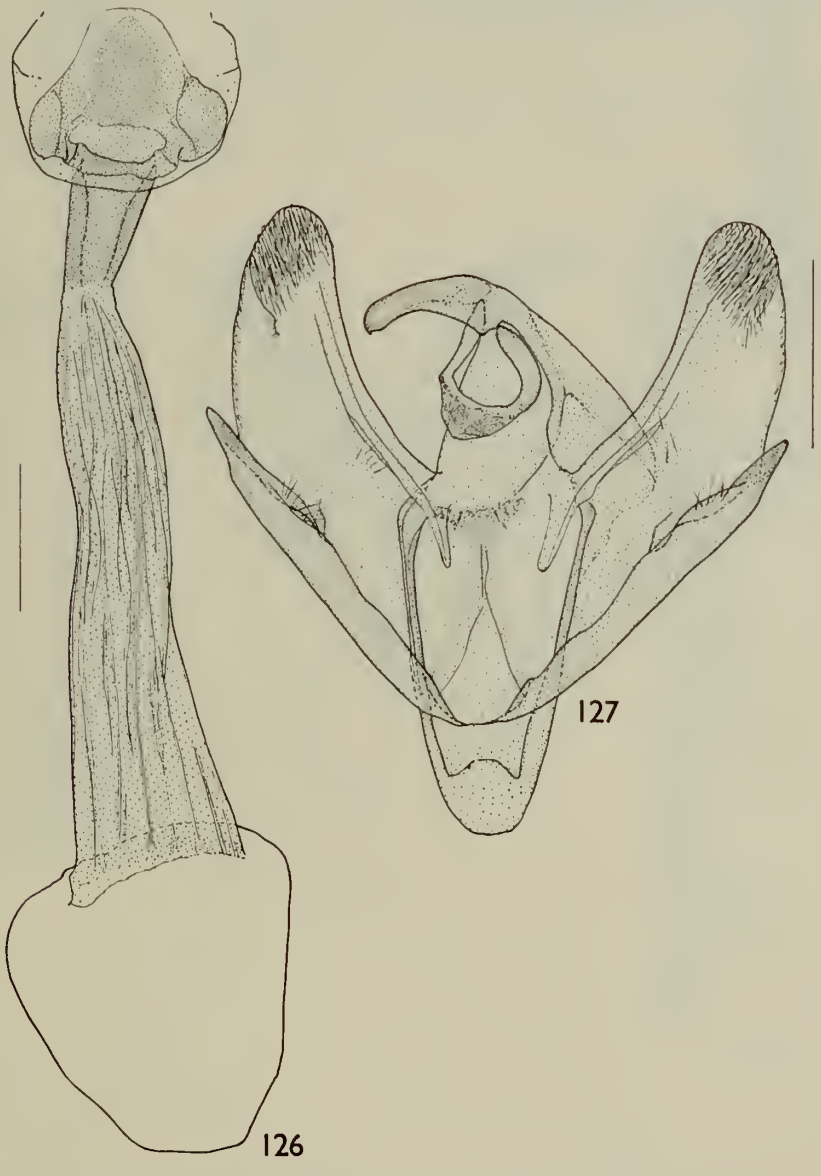
♂ ♀. Externally similar to *pavlitzkiae lamella* in having the upper surface of the wings densely irrorate and patterned with bister.

♂. Genitalia (Text-figs. 128, 129). Scobinate medial plate of gnathus as in nominate subspecies ; projection of sacculus spatulate and incurved through ninety degrees, one-fourth as

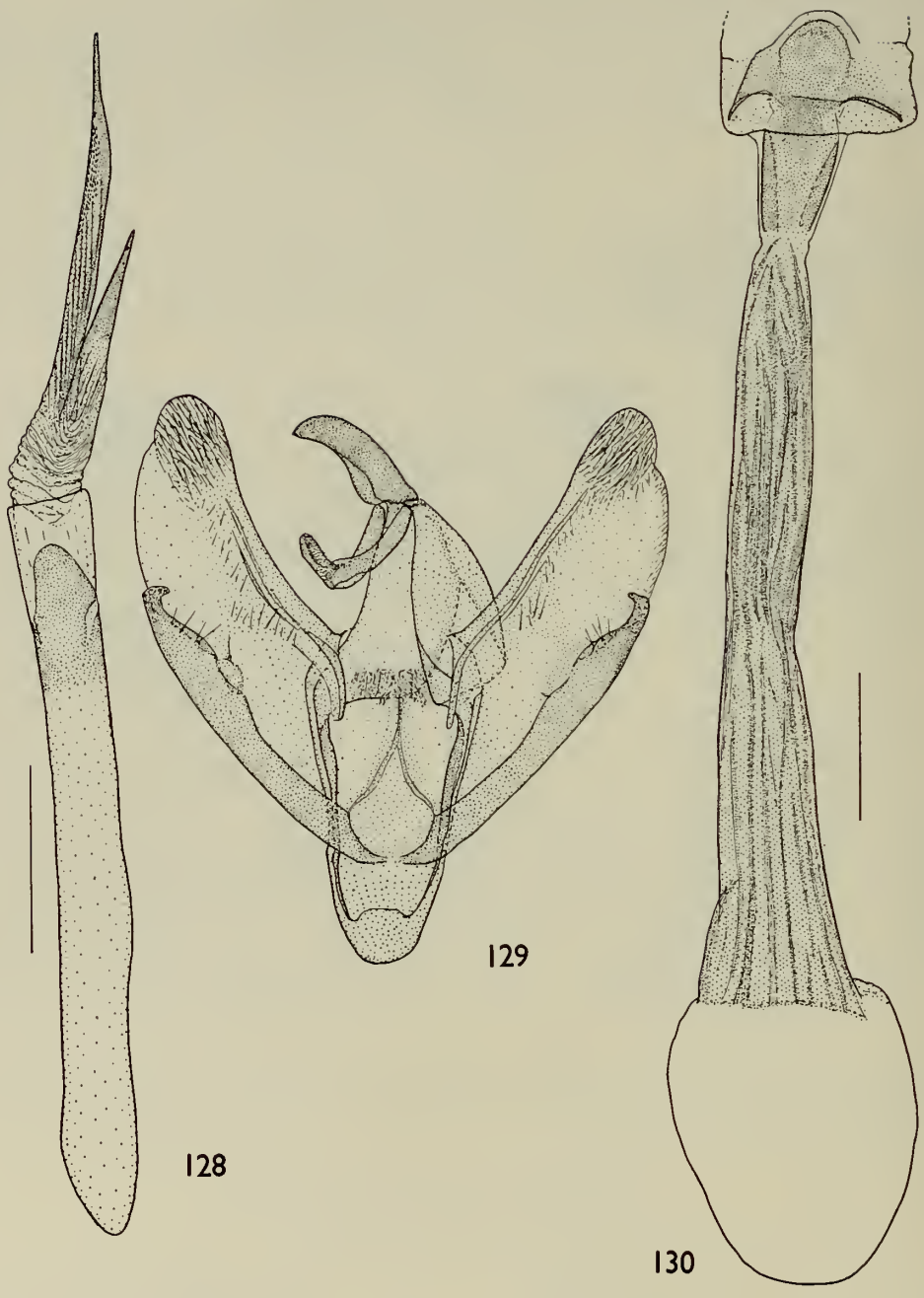
broad as cucullus, minutely scobinate and extending beyond ventral margin of valve ; two cornuti, one one-third and one three-fifths as long as aedeagus.

♀. Genitalia (Text-fig. 130). Lamella postvaginalis similar in form and depth to those of the preceding subspecies, but more heavily sclerotized medio-posteriorly ; well defined posterior margin of colliculum fused with strongly sclerotized anterior margin of lamella antevaginalis.

Measurements. ♂ 38–50 mm. ; ♀ 44–48 mm.



FIGS. 126–127. *C. pavlitzkiae lamella* genitalia. 126, ♀ ; 127, ♂.



FIGS. 128–130. *C. pavlitzkiae etesiae* genitalia. 128, aedeagus ; 129, ♂ ; 130, ♀.

Only one specimen, a female, shows any marked variation in pattern ; the bister irroration on the upper surface of the wings is reduced, the antemedial fascia on the fore wing and the postmedial fascia on each wing are broad and heavily marked. This example is similar in appearance to the form of the nominate subspecies illustrated on Pl. 12, fig. 353.

The incurved, spatulate and minutely scobinate projection of the sacculus and the proportionately shorter cornuti in the male genitalia and the strongly sclerotized margin of the lamella antevaginalis in the female genitalia are diagnostic.

Distribution (Map 6). Ethiopia.

Holotype ♂. [Ethiopia] Abyssinia : Harar, 4.vi.1939 (*R. E. Ellison*), genitalia slide Geometridae No. 5322.

Figs. 131–132. *C. pavlitzkiae oriadelpha* genitalia. 131, ♂ ; 132, ♀.

Paratypes ; [Ethiopia] Abyssinia : Harar, 18.iii.1939 (*R. E. Ellison*), 1 ♀ ; ibid., 9.vi.1939, 1 ♂ ; ibid., ix–x.1939, 1 ♂, 14.x.1939, 1 ♀, 30.x.1938, 1 ♂, 26.xi.1938, 1 ♂, 5.xii.1937, 1 ♂ ; Addis Ababa, 21.iii.1939 (*T. Wikely*), 1 ♂ ; Addis Ababa, 20.iii.1948 (*K. M. Guichard*), 1 ♂ ; ibid., 7.vii.1948, 2 ♂.

Cleora pavlitzkiae oriadelpha ssp. n.

(Text-figs. 131, 132 ; Pl. 12, figs. 357, 358 ; Map 6)

♂ ♀. Variable in pattern, but fairly densely irrorate with fuscous as in the subspecies *lamella* and *etesiae* (Pl. 12, figs. 357, 358).

♂. Genitalia (Text-fig. 131). Scobinate medial plate of gnathus as in nominate subspecies ; projection from sacculus spatulate and minutely scobinate, apex obtusely incuved one-third as broad as cucullus and with less than one-half of the width extending beyond ventral margin of valve ; two cornuti, one one-third and one five-eighths as long as aedeagus, closely similar in proportion to those of subspecies *etesiae*.

♀. Genitalia (Text-fig. 132). Lamella postvaginalis shallow, posterior margin with a heavily sclerotized, raised tip medially ; lamella antevaginalis twice as deep as lamella postvaginalis and evenly sclerotized ; colliculum of even width, three times as long as broad, posterior margin sharply defined.

Measurements. ♂ 46–50 mm. ; ♀ 40–45 mm.

The few known males appear externally distinct in their consistently large size, a not unexpected character in view of the high elevation at which they occur. Structurally the shape of the projection from the cucullus and the proportions of the cornuti in the male genitalia and the form of the sterigma in the female genitalia are diagnostic.

Probably confined to the high ground of the Mau Escarpment. Two specimens labelled " Nakuru, bred " suggest an area of overlap between subspecies *lamella* and subspecies *oriadelpha ;* there is, however, no additional data to indicate either the elevation or the precise source of the early stages from which these adults were reared. Since Nakuru is so close to the south-eastern extremity of the Mau Escarpment, it is possible that the early stages came from that region.

Distribution (Map 6). Kenya, Mau Escarpment.

Holotype ♂. Kenya : Kaptagat, [7867 ft.], 26.xi.1948 (*Walker*).

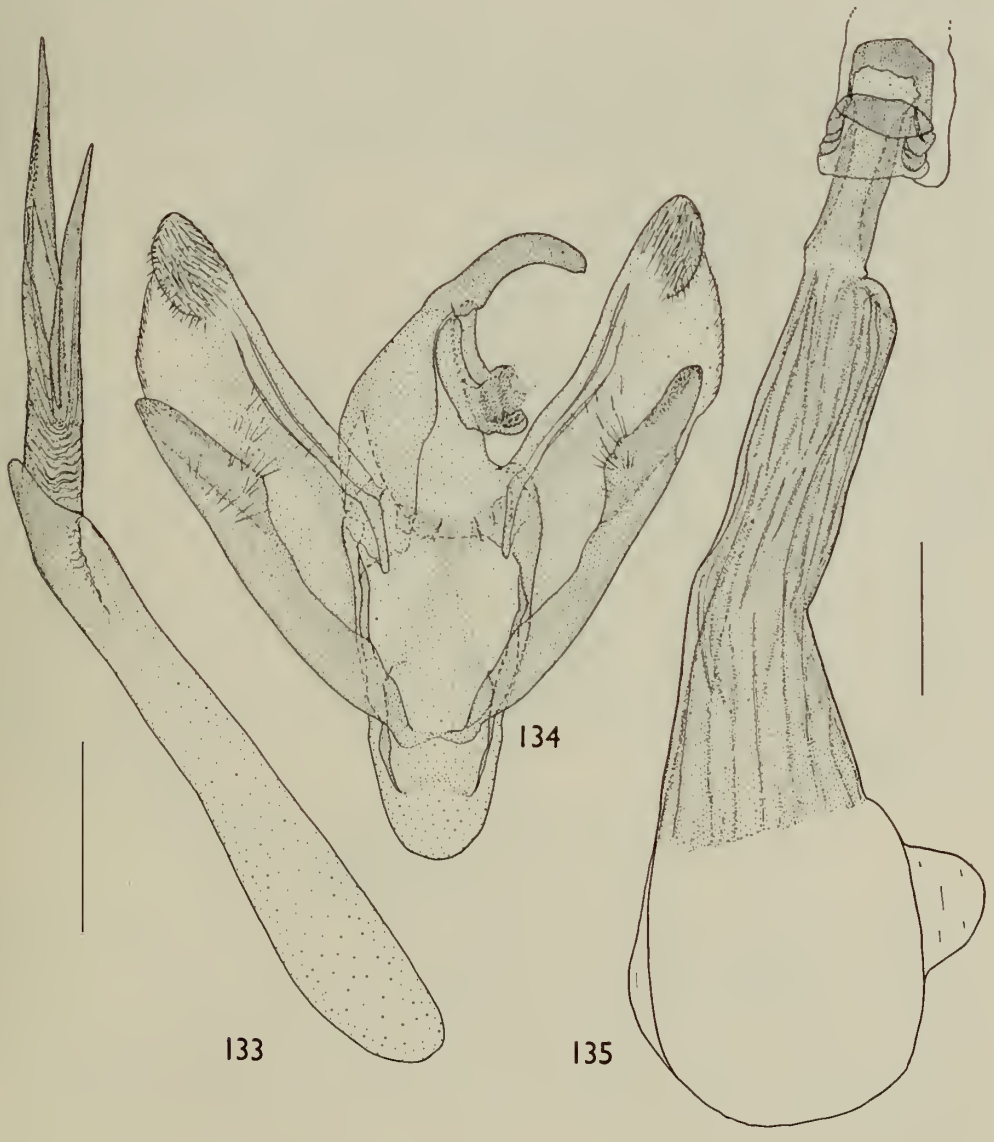
Paratypes : Kenya : Kaptagat [7867 ft.], iii.1948 (*Walker*), 1 ♂ ; ibid., 31.vii. 1948, 1 ♀ ; Mile 478 on Uganda Rly. [Molo, 8065 ft.], 14.xi.1900 (*C. S. Betton*), 1 ♂ ; Nakuru, bred, 27.vii.1948, 1 ♂ ; ibid., 18.vii.1948, 1 ♀.

Cleora pavlitzkiae saltuensis ssp. n.

(Text-figs. 133–135 ; Pl. 12, figs. 359–362 ; Map 6)

♂ ♀. Externally intermediate in the male between the nominate subspecies and subsp. *lamella*, being more densely irrorate with bister than in the former, but not so darkly coloured as the latter ; veins interruptedly but prominently warm buff to ochraceous orange distad of the postmedial fascia in most examples (Pl. 12, figs. 359, 360). The female differs from that of the nominate subspecies in the light, but even fuscous irroration of the upperside of the wings (Pl. 12, figs. 361, 362).

♂. Genitalia (Text-figs. 133, 134). Scobination of medial plate of gnathus broad and extending posteriorly along subscaphium ; projection from sacculus spatulate and minutely scobinate at apex and along inner edge, three-fourths as broad as cucullus ; two cornuti, one one-half and one one-third as long as aedeagus, the scobination on the ventral surface of the larger cornutus reduced to a short patch in apical half, equal in length to one-fourth of the cornutus ; shorter cornutus bears one or two adpressed spines in some examples.



FIGS. 133–135. *C. pavlitzkiae saltuensis* genitalia. 133, aedeagus ; 134, ♂ ; 135, ♀.

♀. Genitalia (Text-fig. 135). Lamella antevaginalis and lamella postvaginalis of about even depth, the latter evenly sclerotized, slightly produced and tapered medio-posteriorly ; colliculum of even width, three times as long as broad.

Measurements. ♂ 36–46 mm. ; ♀ 41–44 mm.

There is little variation in colour and pattern in the series examined ; one male example is similar to the form of the nominate subspecies illustrated on Pl. 12, fig. 353, with heavily marked transverse fasciae, and two males are comparable with *tulbaghata* ab. *fumata*, the medial area of the fore wing and the proximal half of the hind wing being suffused with fuscous. Structurally the extensive scobination of the medial plate of the gnathus and subscaphium and the form of the projection from the sacculus in the male genitalia, and the even depth of the lamellae and the more evenly sclerotized lamella postvaginalis are diagnostic.

Biology. Adults have been reared from larvae found on *Pinus patula* and *Cupressus lusitanica* in W. Uganda.

Distribution (Map 6). Burundi ; Rwanda ; Central Eastern Congo (Leopoldville) ; S.W. Uganda, Kigezi.

Holotype ♂. Burundi : Kitega, 17.viii.1962 (*Dr. M. Fontaine*), in Musée Royal de l'Afrique Centrale.

Paratypes : Burundi : Kitega, 9–21.iii.1962 (*Dr. M. Fontaine*), 2 ♀ ; ibid., 17.iv.1962, 1 ♂, 8.vi.1962, 1 ♀, 13–28.vii.1962, 7 ♂, 2 ♀, 1–29.viii.1962, 10 ♂, 5 ♀, 9–15.x.1962, 2 ♂, all in Musée Royal de l'Afrique Centrale. [Rwanda] : Lake Kivu, Rugege Forest, 7000 ft., x.1921 (*T. A. Barns*), 1 ♂ in British Museum (Natural History). [Congo (Leopoldville)] Belgian Congo : Rutschuru, i.1928 (*Ch. Seydel*), 1 ♂ : Kivu, Terr. Lubero, Mulo, 9.x.1954 (*R. P. M. J. Célis*), 1 ♀ ; N. Lac Kivu, Rwankwi, iv–v.1948 (*J. V. Leroy*), 2 ♂, 1 ♀ ; ibid., 16–29.viii.1947, 1 ♂, 1 ♀, 6.ix.1947, 1 ♂, 19.ix.1947, 1 ♂, 1.xi.1947, 1 ♂, xii.1947, 1 ♂ ; Kivu, Nyamunyunga (Mulungu), v.1960 (*J. Hecq*), 1 ♂, all in Musée Royal de l'Afrique Centrale ; Mt. Hoyo, 31.x.1956 (*Ch. Seydel*), 1 ♂. Uganda : Kigezi, Mafuga Forest, iii.1952 (*T. H. E. Jackson*), 2 ♀ ; Mafuga Forest, 17.vii.1961, ex *Pinus patula* (*W. K. Brown*), 1 ♂ ; ibid., 14.vii.1962, 1 ♂, 23.vii.1962, 1 ♀ ; Mafuga, 9.viii.1962, ex *Cupressus lusitanica* (*W. K. Brown*), 1 ♀.

Cleora lima sp. n.

(Text-figs. 136, 137 ; Pl. 12, figs. 363, 364 ; Map 8)

♂. Vestiture and upper surface of wings closely similar to *pavlitzkiae saltuensis*. Under surface of wings white, suffused and patterned with fuscous (Pl. 12, fig. 364) ; the dark suffusion is markedly more extensive than that found in *pavlitzkiae saltuensis*.

♂. Genitalia (Text-figs. 136, 137). Uncus stout with minute thorn-like tip ; scobinate medial plate of gnathus semi-circular ; apex of juxta slightly rugose ; apical projection of sacculus cylindrical, cygnate and scobinate one and one-fourth times as long as width of cucullus ; vesica with two tapered cornuti fused at base, one one-half and one one-third as long as aedeagus, the longer cornutus scobinate on ventral surface from one-half to three-fourths of its length, the shorter one smooth.

♀. Not known.

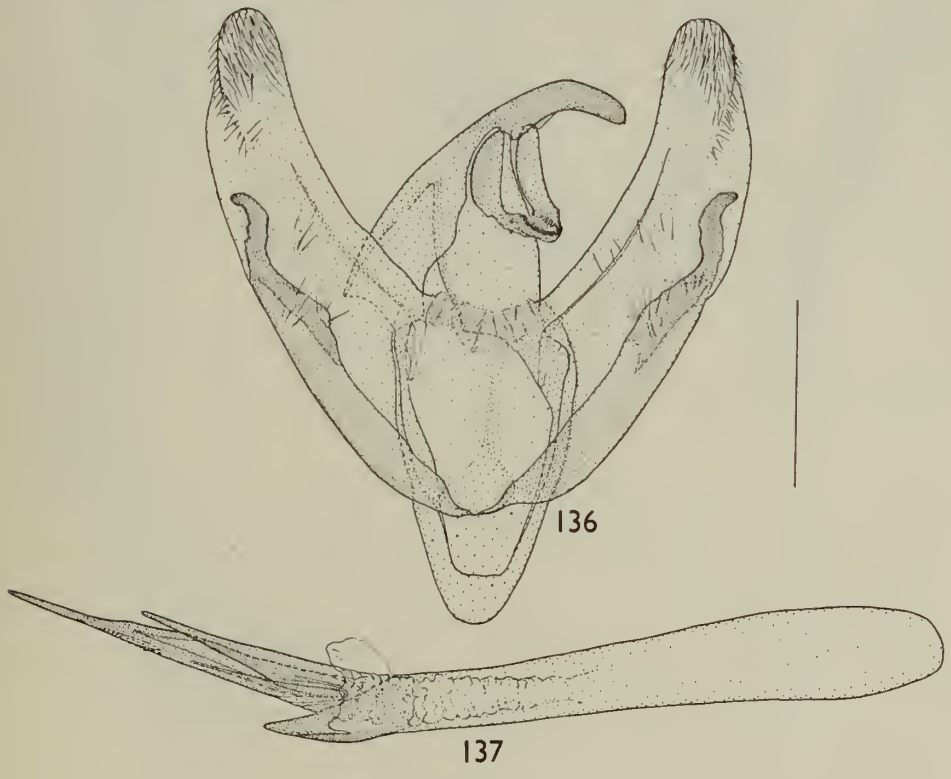
Measurement. ♂ 39–42 mm.

Closely related to and sympatric with *pavlitzkiae saltuensis ;* distinguished from it externally in the more darkly suffused under surface of the wings and structurally in the less extensively scobinate medial plate of the gnathus, the differently developed apex of the juxta and strikingly in the shape of the sacculus.

Distribution (Map 8). E. Congo (Leopoldville) ; Burundi ; Rwanda.

Holotype ♂. [Congo (Leopoldville)] : Rwankwi, iv.1948 (*J. V. Leroy*), in Musée Royal de l'Afrique Centrale.

Paratypes : Burundi : Kitega, 25.viii.1962 (*Dr. M. Fontaine*), 1 ♂ in Musée Royal de l'Afrique Centrale. [Rwanda] : Lake Kivu, Rugege Forest, 8000 ft., xii.1921 (*T. A. Barns*), 1 ♂. [Congo (Leopoldville)]: N.W. Kivu, Upper Oso River, 4000 ft., forest with some grass, ii.1924, wet season (*T. A. Barns*), 1 ♂.



Figs. 136–137. *C. lima* genitalia. 136, ♂ ; 137, aedeagus.

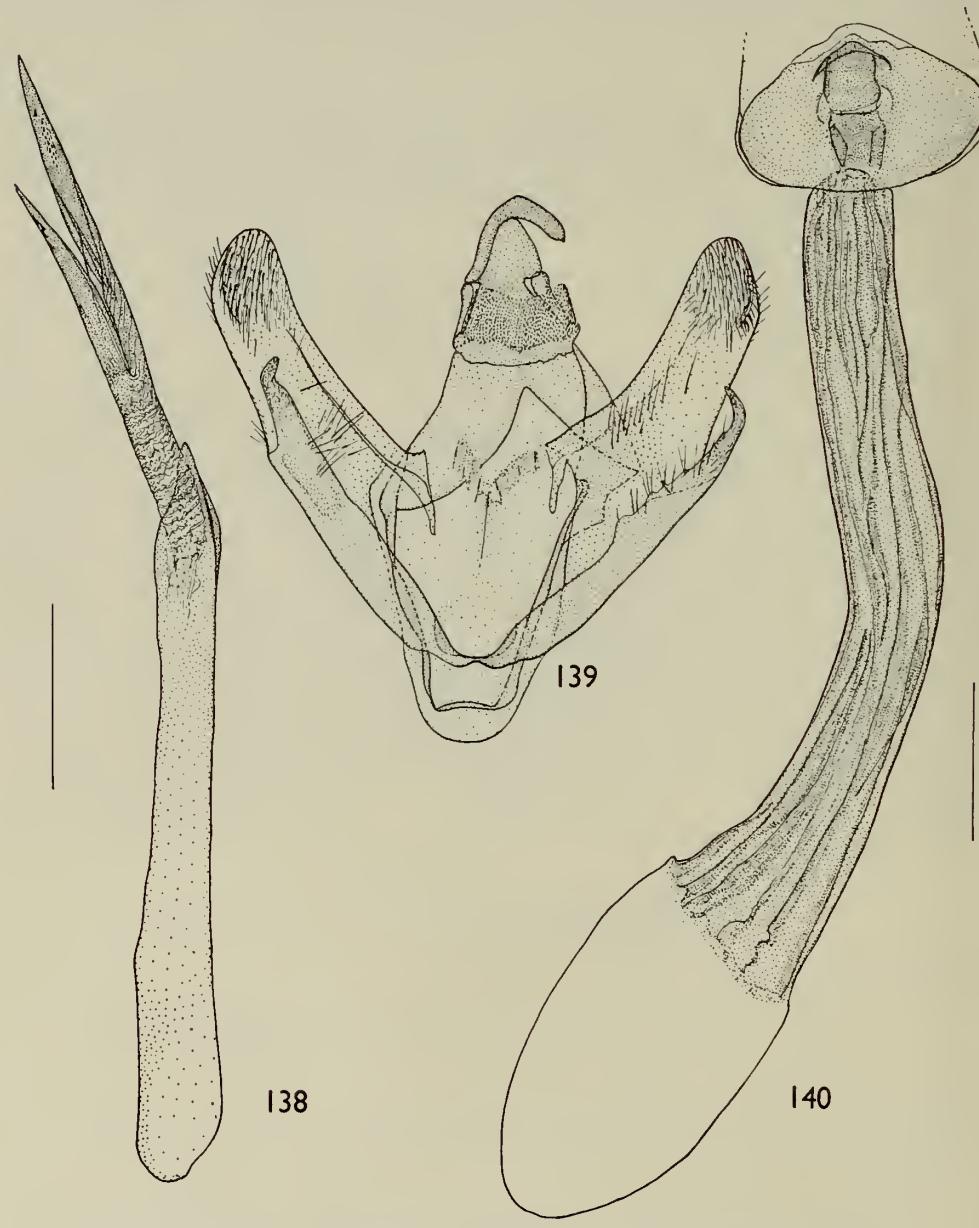
Cleora scobina sp. n.

(Text-figs. 138–140 ; Pl. 9, figs. 303, 304 ; Pl. 11, figs. 335, 336 ; Map 5)

♂. Vestiture white, lightly irrorate with snuff brown and fuscous, except on first abdominal segment ; patagia edged with bister. Wings white, lightly irrorate with cinnamon drab and bister ; a broad fascia proximad of antemedial fascia on fore wing and a similar fascia distad of

postmedial fascia on each wing cinnamon drab ; other transverse fasciae bister tinged with tawny ; cubital veins and other veins distad of postmedial fasciae streaked light to warm buff, streak on M_1 of fore wing dilate to large spot. (Pl. 11, fig. 335). Under surface of wings white, sharply patterned with bister (Pl. 11, fig. 336).

♂. Genitalia (Text-figs. 138, 139). Uncus slender with minute thorn-lke tip ; scobinate medial plate of gnathus one and one-fourth times as broad as cucullus, slightly produced medio-



Figs. 138–140. *C. scobina* genitalia. 138, aedeagus ; 139, ♂ ; 140, ♀.

ventrally ; scobination extending posteriorly to subscaphium for distance equal to one-half of its width ; juxta slightly rugose at apex ; projection of sacculus tapered, spatulate, scobinate and slightly setose, equal in length to uncus ; vesica with two tapered cornuti fused at base, one three-tenths and one two-fifths as long as aedeagus, each scobinate on one surface in apical half.

Female patterned similarly to male on upper surface of wings but dark irroration sparse ; cinnamon drab bands reduced and broken ; transverse fasciae very slender, bister to fuscous, lacking tawny tinge of male (Pl. 9, figs. 303, 304).

♀. Genitalia (Text-fig. 140). Sterigma ovate ; lamella postvaginalis with a raised, tapered lobe medio-posteriorly ; anterior fourth of bursa copulatrix membranous and ovate, remainder cylindrical, ribbed and sclerotized and obtusely bowed.

Measurements. ♂ 37–42 mm. ; ♀ 38–44 mm.

Specimens from E. Congo (Leopoldville) are rather more bister in general tone than the pinker brown examples from Kampala and other localities in Western Uganda, but in other respects the series shows little variation.

A short series of five specimens from the Ivory Coast is provisionally associated with *scobina*, though excluded from the type series. The specimens are rather smaller and a little more heavily marked, but agree structurally with *scobina* in the genitalia of both sexes. Closely allied to *pavlitzkiae* and to *lima*, differing externally from the former in the pattern of the under surface of the wings and from both in the warmer pinker or redder brown tone of the markings of the upper surface of the wings. In the male genitalia the form of the scobinate medial plate of the gnathus and the form of the sacculus and in the female genitalia the form of the sterigma are diagnostic.

Biology. Adults have been reared from larvae found on *Cupressus lusitanica* and *Eucalyptus torelliana* in Western Uganda.

Distribution (Map 5). Uganda ; Burundi ; Congo (Leopoldville) ; Ivory Coast.

Holotype ♂. Uganda : Kampala, 22.viii.1932 (*H. Hargreaves*), genitalia slide Geometridae No. 2291.

Paratypes : Uganda : Kampala, 7.vii.1927 (*H. Hargreaves*), 1 ♂ ; ibid., pupated 13.v.1931, emerged 22.v.1931, 1 ♀ ; ibid., 11.vii.1932, 1 ♂ ; Kampala, 29.vii.1925, 1 ♂ ; Kampala, 26.xi.1929 (*G. H. E. Hopkins*), 1 ♂ ; Entebbe, 1.iv.1900 (*Capt. H. B. Rattray*), 1 ♀ ; Bwamba, ii–iii.1957 (*R. Carcasson*), 1 ♀ ; Mpanga Forest, 22.xi.1960, ex *Cupressus lusitanica* (*W. K. Brown*), 1 ♀ ; Mpanga Forest, 21.vii.1962, ex *Eucalyptus torelliana* (*W. K. Brown*), 1 ♀. Burundi : Usumbura, 900 m., 8.vii.1961 (*Dr. M. Fontaine*), 1 ♂, in Musée Royal de l'Afrique Centrale. [Congo (Leopoldville)] Belgian Congo : Ruwenzori, 18–20.v.1950 (*H. B. D. Kettlewell*), 3 ♂, 2 ♀ ; Takalu, W. of Lake Albert, iv, 1 ♂ ; E. Ituri Valley, 30 miles south of Irumu, 3000 ft., vii.1924 (*T. A. Barns*), 1 ♂ ; Upper Uelle distr., Dungu, iv,v,vii, 3 ♂ ; Upper Uelle distr., Sabuni, v, 1 ♂, all in British Museum (Natural History) ; Kibali-Ituri, Nioka, 10.vii.1953 (*J. Hecq*), 1 ♀ ; Haut-Uelé, Moto, 1921, 2 ♂ ; Rutschuru, 2.i.1928 (*Ch. Seydel*), 1 ♂ ; N. Lac Kivu, Rwankwi, 4.ix.1947 (*J. V. Leroy*), 1 ♂ ; ibid., iv.1948, 2 ♂ ; ibid., v.1948, 1 ♂ ; Lulua Kapanga, xii.1932 (*F. G. Overlaet*), 1 ♂, all in Musée Royal de l'Afrique Centrale.

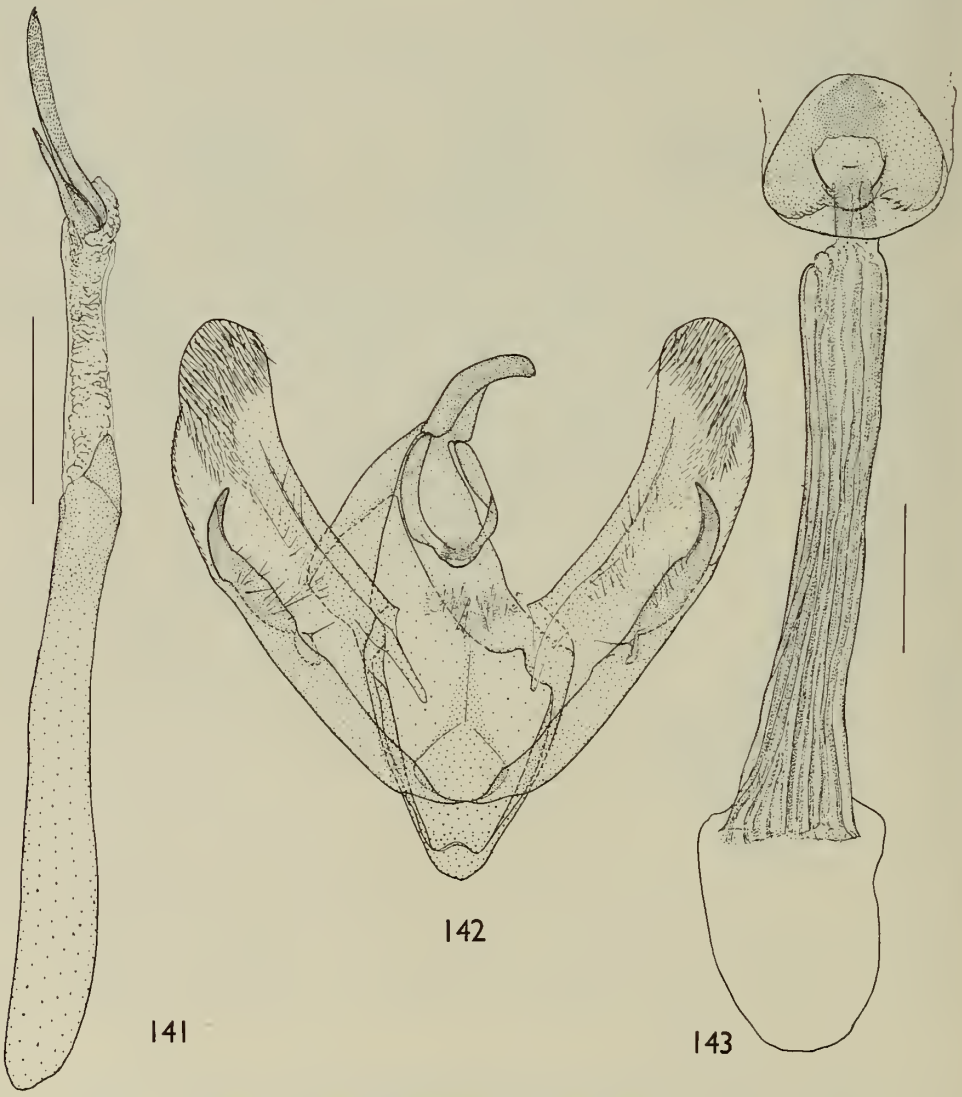
Other material. Ivory Coast : Bingerville, 1915 (*G. Melou*), 1 ♂, 1 ♀ ; ibid., 1–7.vi.1915, 1 ♀ ; ibid., 11–14.viii.1915, 1 ♂, 1 ♀.

Cleora radula sp. n.

(Text-figs. 141–143 ; Pl. 13, figs. 365–379 ; Map 7)

♂. Colours of vestiture and of upper and under surfaces of wings vary geographically.

♂. Genitalia (Text-figs. 141, 142). Uncus with minute thorn-like tip ; scobinate medial plate of gnathus semicircular, diameter equal to one-half width of cucullus ; apex of juxta rugose ; arm of sacculus spatulate, tapered and scobinate, subequal in length to uncus, varying a little individually in width ; vesica with two cornuti fused at base, one one-third and one one-sixth as long as aedeagus, the longer one densely and quite coarsely scobinate in apical two-thirds and usually very little tapered, the shorter one tapered and usually completely smooth.



FIGS. 141–143. *C. radula* genitalia. 141, aedeagus ; 142, ♂ ; 143, ♀.

♀. Vestiture white, lightly irrorate with bister ; patagia edged with bister. Wings white ; fore wing with a slender snuff brown band proximad of antemedial fascia ; similar band distad of postmedial fascia on each wing, that on the fore wing broadening to subterminal at costa and failing at inner margin, that on the hind wing failing at costa ; remainder of wing very lightly irrorate and patterned with bister (Pl. 13, fig. 367). Underside of wings white, patterned with bister (Pl. 13, fig. 368).

♀. Genitalia (Text-fig. 143). Sterigma with large, clearly defined ostium bursae ; colliculum twice as long as broad with a short projection medio-posteriorly ; anterior fourth of bursa copulatrix membranous ; remainder of bursa cylindrical, ribbed, sclerotized and scobinate on inner surface ; posterior margin of seventh sternite sclerotized and shallowly concave medially.

The scobinate and spatulate projection from the sacculus in the male genitalia and the structure of the sterigma in the female genitalia suggest an affinity with *scobina* and *lima*. From these species *radula* may be distinguished in the male genitalia by the less extensive scobination of the gnathus and by the dense scobination and form of the larger of the two cornuti ; in the female genitalia the large, clearly defined ostium bursae in the sterigma serves to separate *radula* from *scobina* ; the female of *lima* is not yet known.

Distribution (Map 7). Guinea ; Ghana ; Nigeria ; Fernando Po ; Cameroun ; Angola ; Congo (Leopoldville) ; Uganda ; Kenya.

Cleora radula radula ssp. n.

(Pl. 13, figs. 365–369 ; Map 7)

♂. Vestiture drab, irrorate with bister ; patagia edged with bister. Wings tilleul buff, densely irrorate with snuff brown and fuscous ; sub-basal fascia on fore wing and a band distad of postmedial fascia on each wing snuff brown ; cubital veins and other veins distad of postmedial fasciae streaked with light buff ; other transverse fasciae and discal spots fuscous (Pl. 13, fig. 365). Under surface tilleul buff near discal spots, remainder of wings suffused and patterned with fuscous (Pl. 13, fig. 366).

♀. (Pl. 13, figs. 367, 368). See under description of species.

Measurements. ♂ 38–44 mm. ; ♀ 34–44 mm.

Fifteen of the 43 male examples are darker than the type, bister replacing snuff brown and fuscous black replacing fuscous ; in such specimens the transverse fasciae in the distal third of each wing are edged with a sparse white irroration. In six other males the fore wing is suffused with light buff between the submedial fold and vein *A*1, from base to subterminal fascia, and the bands distad of the postmedial fascia on each wing, snuff brown in the type, are similarly suffused ; in these examples the hind wing is suffused with light buff especially distad of the postmedial fascia (Pl. 13, fig. 369). The darker male examples are externally similar to *derogaria*, but have a more sharply defined pattern ; the genitalia are, however, quite distinct.

Eleven males from Angola, apparently intermediate between typical *radula* and the following subspecies, are provisionally associated with the nominate series, but excluded from the type series ; the ground colour of the wings is paler, clearly visible distad of the discal spot on the fore wing and the dark irroration is less dense.

Distribution (Map 7). Equatorial forest of Gabon and Congo (Leopoldville) ; Angola.

Holotype ♂. [Congo (Leopoldville)] : Lusambo, 29.vi.1949 (*Dr. M. Fontaine*), in Musée Royal de l'Afrique Centrale.

Paratypes : Gabon : Lastourville, i.1959 (*P. Rougeot*), 1 ♂, in British Museum (Natural History). [Congo (Leopoldville)] : Leopoldville, Binza, 29.ix.1954 (*Dr. M. Fontaine*), 1 ♀ ; Stanleyville, 9.vi.1948 (*Dr. Faniel*), 1 ♂ ; Sankuru, Djeka, 17.xii.1952 (*Dr. M. Fontaine*), 1 ♂ ; Sankuru, Komi, vi.1939 (*J. Ghesquière*), 1 ♂ ; Sankuru, Lusambo, 7.v.1950 (*Dr. M. Fontaine*), 1 ♂ ; ibid., 14.vi.1949, 1 ♂ ; 17.vi. 1949, 1 ♂, 1 ♀ ; 20.vi.1949, 1 ♂ ; 2.vii.1949, 1 ♂ ; 14.vii.1950, 1 ♂ ; 18.vii.1950, 1 ♂ ; 23.vii.1950, 1 ♂, 1 ♀ ; 2.viii.1950, 1 ♀ ; 6.viii.1950, 1 ♂ ; 7.viii.1950, 2 ♂ ; 8.viii.1950, 1 ♂ ; 9.viii.1950, 1 ♂ ; 14.viii.1950, 1 ♂ ; 31.viii.1950, 1 ♂ ; ix.1950, 1 ♂ ; 5,6,8, 14.ix., each 1 ♂ ; x.1950, 1 ♂ ; 11.x.1950, 1 ♂ ; Sankuru, Katako-Kombe, 16.iii. 1952 (*Dr. M. Fontaine*), 1 ♂ ; ibid., 19.iii.1952, 1 ♂ ; 6.ix.1952, 1 ♂ ; 15.ix.1952, 1 ♂ ; 8.x.1952, 1 ♂ ; 14.xii.1952, 1 ♂ ; Uele, Paulis, 19.i.1956 (*Dr. M. Fontaine*), 1 ♂ ; ibid., 2.ii.1956, 1 ♀ ; 4.iv.1956, 1 ♂ ; 8.iv.1956, 1 ♂ ; 12.iv.1956, 1 ♂ ; 4.vii.1956, 1 ♂ ; 28.xi.1952, 1 ♂ ; 1.xii.1956, 1 ♂ ; ibid., 28.xii.1955, 1 ♀ ; Ituri, Nduye-Makara, x.1921 (*A. Pilette*), 1 ♂, all in Musée Royal de l'Afrique Centrale ; Kondolola District, Lindi Valley, 1600–1700 ft., v.1921 (*T. A. Barns*), 2 ♂ in British Museum (Natural History).

Other material. Angola : Quicolungo, 120 km. N. of Lucala, 800 m., iv.1936 (*R. Braun*), 11 ♂.

Cleora radula leptopasta ssp. n.

(Pl. 13, figs. 370, 371 ; Map 7)

♂. Differs from nominate subspecies in colour. Ground colour of wings white ; antemedial fascia on fore wing, medial and postmedial fasciae, terminal interneural spots and outline of discal spots on each wing bister ; remaining transverse fasciae snuff brown ; light irroration snuff brown and bister. (Pl. 13, fig. 370). Under surface of wings white, suffused and patterned with bister (Pl. 13, fig. 371).

Measurements. ♂ 38–43 mm.

Externally closely similar to *dargei* with which it occurs and only reliably determined by reference to the genitalia.

Distribution (Map 7). Ghana ; Nigeria.

Holotype ♂. [Nigeria] : Lagos, genitalia slide Geometridae No. 5469.

Paratypes : [Ghana] Gold Coast : Coomassie [Kumasi] (*H. Whiteside*), 2 ♂ ; Nsuaem, i.1922 (*N. E. Bell*), 1 ♂. Nigeria : Lagos, 1 ♂ ; Ilesha (*L. E. H. Humfrey*), 1 ♂ ; S. Nigeria, 1 ♂.

Specimens from the localities listed below are associated provisionally with subsp. *leptopasta*, but excluded from the type series. The males from Fernando Po and from Lolodorf and Johann-Albrechts Höhe in Cameroun are more densely irrorate with bister ; no male from Guinea is available for study.

GUINEA : Massadou near Macenta, 1000 ft., 13–17.v.1926 (*C. L. Collenette*), 1 ♀. FERNANDO PO : (*W. Cooper*), 2 ♂, 1 ♀. [CAMEROUN] : Afriq. Occid., Station Kamerun, Lolodorf, 1894–1895 (*L. Conradt*), 1 ♂ ; Johann-Albrechts Höhe (*L. Conradt*), 2 ♂, 1 ♀ ; Bitje, Ja River, 1 ♂.

Cleora radula arenosa ssp. n.

(Pl. 13, figs. 372–376 ; Map 7)

♂. Ground colour of upper surface of wings white ; sub-basal band on fore wing and band distad of postmedial fascia on each wing russet to ochraceous tawny and often diffuse ; streaking on veins ochraceous tawny (Pl. 13, figs. 373, 374). In three examples medial area of fore wing posterior of cubitus and hind wing proximad of postmedial fascia suffused with fuscous black (Pl. 13, fig. 372).

♀. Only specimen known possibly aberrant ; area proximad of medial fascia on upperside of each wing suffused with bister ; strongly marked bister spot on fore wing between veins M_2 and Cu_1 and between postmedial and subterminal fasciae (Pl. 13, figs. 375, 376).

Measurements. ♂ 38–41 mm. ; ♀ 43 mm.

The male is strikingly distinct in the presence of the conspicuous russet to ochraceous tawny sub-basal band on the fore wing and the similarly coloured postmedial bands on each wing.

Distribution (Map 7). E. Congo (Leopoldville), Mt. Hoyo and Kivu ; W. Uganda.

Holotype ♂. UGANDA : Bwamba, vi.1956 (*R. Carcasson*).

Paratypes : [CONGO (Leopoldville)] BELGIAN CONGO : Mount Hoyo, 10.ii.1956 (*Ch. Seydel*), 1 ♂ ; ibid., 1.iii.1956, 1 ♂ ; Ituri Forest, 3800–4000 ft., iii–iv.1930, beginning wet season (Lord Howard de Walden Exp.), 1 ♂ ; Escarpment West Semliki Valley, 20 mls. S.W. of Boga, 3000–4000 ft., vii.1924, borders of tropical forest and long grass (*T. A. Barns*), 1 ♂ ; N. Lac Kivu, Rwankwi, iv.1948 (*J. V. Leroy*), 2 ♂ and 19.viii.1947, 1 ♂ in Musée Royal de l'Afrique Centrale ; Takulu, W. of Lake Albert, 1 ♂ ; W. Kivu, south side middle Lowa Valley, south of Walikali, 3000 ft., forest, iii.1924, wet season (*T. A. Barns*), 1 ♂ ; W. Kivu, Upper Lowa Valley, nr. Masisi, 5000–6000 ft., forest and long grass, ii.1924, wet season (*T. A. Barns*), 2 ♂ ; W. Kivu, Lowowo Valley, South Lowa District, 4000 ft., mountain forest, iii.1924, wet season (*T. A. Barns*), 1 ♂. UGANDA : Bwamba, v.1956 (*R. Carcasson*), 3 ♂ ; ibid., vi.1956, 1 ♀ ; Kigezi District, Impenetrable Forest, Kanungu, 4500 ft., v.1952 (*J. A. Burgess*), 1 ♂.

Cleora radula eumelana ssp. n.

(Pl. 13, figs. 377–379 ; Map 7)

♂. Ground colour of wings on upper surface cartridge buff, weakly suffused with russet and irrorate with black ; veins streaked with ochraceous tawny ; remainder of pattern black (Pl. 13, fig. 378). Under surface tilleul buff, suffused and patterned with fuscous black (Pl. 13, fig. 379).

Measurements. ♂ 40–41 mm. ; ♀ 40 mm.

The subspecies is distinct in the male in the russet suffusion, the strong black irroration and the strongly marked black pattern of the upper surface of the wings.

The single female is probably a striking aberration ; it has the medial area of the fore wing black, edged proximally and distally with russet ; the proximal half of the hind wing is black, edged distally with russet ; remainder of wings ochraceous buff, irrorate and patterned with black and, in the apical area of the fore wing, with russet (Pl. 13, fig. 377). Under surface of wings light buff, suffused and patterned with fuscous black.

Of the type locality R. H. Carcasson of the Coryndon Museum writes : " The Malaba Forest was once part of the Kakamega Forest, which is in Western Kenya on the escarpment above Lake Victoria. The altitude is from 5000–6000 ft., Malaba itself being nearer 5000 ft.

The Kakamega area has a very interesting relic Congo fauna and flora and many of the birds are endemic races of Congo species ; the same pattern is repeated in some of the small mammals and in numerous Lepidoptera. The distributional pattern of your *Cleora* is by no means unusual."

Distribution (Map 7). W. Kenya, Kakamega.

Holotype ♂. W. Kenya : [Kakamega], Malaba Forest, vi.1957 (*C. R. Howard*), genitalia slide Geometridae No. 5360.

Paratypes : data as holotype, 1 ♂, 1 ♀ in British Museum (Natural History), 2 ♂ in Coryndon Museum.

Cleora rothkirchi (Strand) **comb. n.**

(Text-figs. 144–146 ; Pl. 14, figs. 380–391 ; Map 8)

Boarmia rothkirchi Strand, 1914 : 44.
Boarmia acaciaria sensu Hampson, 1903 : 330.

♂ ♀. Colour and pattern of upper and under surfaces of wings vary geographically and are described under subspecific headings ; all subspecies have discal spots fuscous to fuscous black with smoke grey centres, contrasting sharply with respective medial areas.

♂. Genitalia (Text-figs. 144, 145). Uncus with thorn-like tip ; scobinate medial plate of gnathus narrowly rounded ; apex of juxta Y-shaped ; sacculus dilate towards mid-valve in apical third ; apex of sacculus minutely produced and sparsely setose ; vesica with two stout, tapered cornuti fused at base, one five-eighths as long, one one-half as long as aedeagus, the shorter tipped with a cluster of spines or spined at one side in apical eighth.

♀. Genitalia (Text-fig. 146). Lamella postvaginalis weakly sclerotized medially ; colliculum narrowed, anterior width equal to one-half of length, posterior margin sharply defined ; anterior fourth of bursa copulatrix membranous, a little dilate at one side, remainder cylindrical, ribbed and lightly sclerotized.

A species widely distributed throughout tropical Africa and the Mascarene region, varying geographically in colour of vestiture and wings, and apparently without especially close affinities with any other known species. In the male genitalia the shape of the sacculus and the shape and proportions of the two cornuti, the shorter one being scobinate at one side near apex, and in the female genitalia the shape of the sterigma are diagnostic.

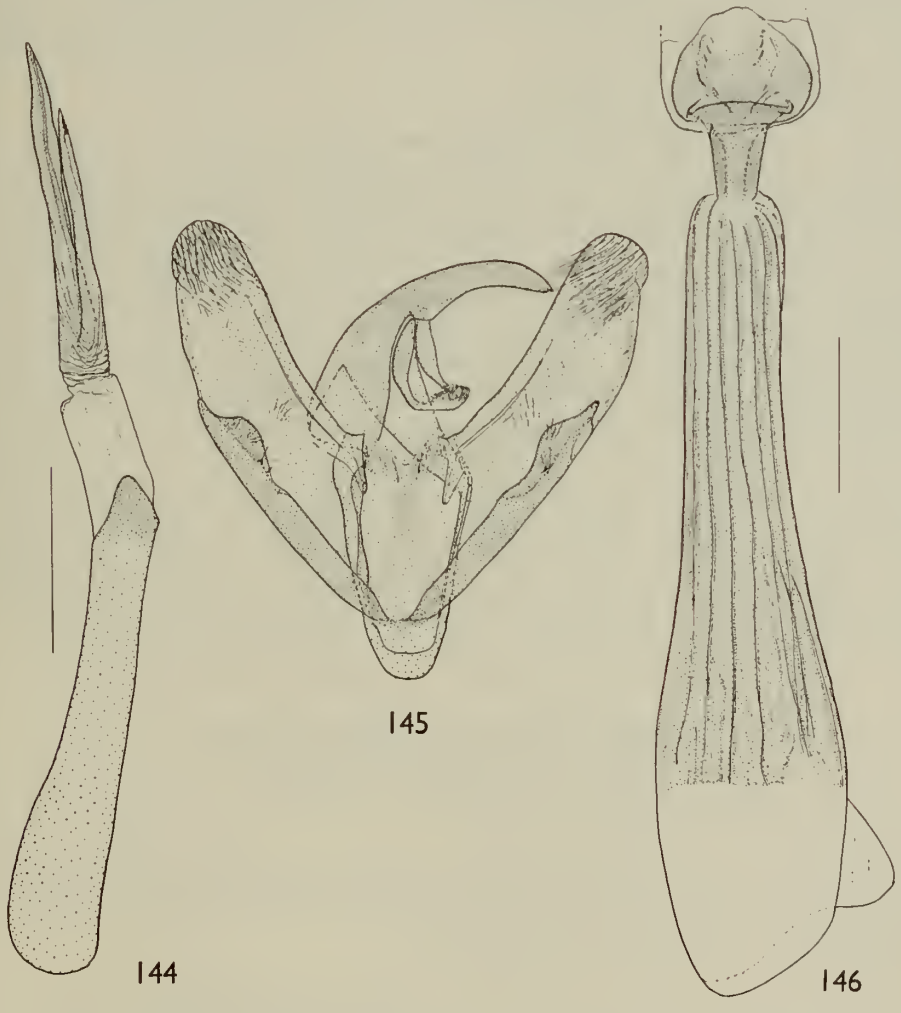
Distribution (Map 8). Ivory Coast ; Ghana ; Nigeria ; Cameroun ; Angola ; Congo (Leopoldville) ; Rwanda ; Burundi ; Uganda ; Kenya ; Tanzania ; Mozambique ; Rhodesia ; Socotra ; Comoro Is ; Madagascar.

Cleora rothkirchi rothkirchi (Strand)

(Pl. 14, figs. 380–385 ; Map 8)

Boarmia rothkirchi Strand, 1914 : 44.

♂. Vestiture tilleul buff, vinaceous buff or pinkish buff and, except first abdominal segment, irrorate with bister ; patagia edged with bister. Wings tilleul buff, vinaceous buff or pinkish buff irrorate and patterned with bister or fuscous ; fore wing with a snuff brown to bister band



FIGS. 144–146. *C. rothkirchi* genitalia. 144, aedeagus ; 145, ♂ ; 146, ♀.

proximad of antemedial fascia ; a similar band distad of postmedial fascia on each wing, these bands weakly defined ; veins interruptedly light to warm buff distad of postmedial fasciae, streak on vein M_2 of forewing dilate to form spot (Pl. 14, fig. 380). Under surface of wings white, patterned with bister (Pl. 14, fig. 381).

♀. Pattern similar to that of male but less strongly defined and dark irroration usually sparse (Pl. 14, fig. 382). Underside white, tinged with light buff on veins and margins and patterned with bister (Pl. 14, fig. 383).

Measurements. ♂ 33–38 mm. ; ♀ 34–40 mm.

The series includes forms comparable with *tulbaghata* abs. *flavipleta* and *fumata ;* a male from W. Kenya has the proximal third of the fore wing and distal half of each wing densely snuff brown.

Distribution (Map 8). Ivory Coast ; Ghana ; Nigeria ; Cameroun ; Angola ; Congo (Leopoldville) ; Uganda ; Kenya ; Tanzania ; Mozambique ; Rhodesia.

Material examined. Holotype ♀. CAMEROUN : Duala, 22.x. (*v. Rothkirch*), in Deutsches Entomologisches Institut.

IVORY COAST : Bingerville, 1915 (*G. Melou*), 2 ♀. GHANA : N. Territorie Ketes, Krachi (*A. W. Cardinall*), 2 ♀. NIGERIA : R. Niger, 7 miles S. of Baro, 7.ii.1911 (*G. B. Simpson*), 1 ♀ ; Bonny, 3.i.1902 (*Ansorge*), 1 ♀. ANGOLA : Quirimbo, 75 km. E. of P. Amboim, 300 m., 7–12.v.1934 (*Dr. K. Jordan*), 1 ♂, 1 ♀, all in British Museum (Natural History). CONGO (Leopoldville) : Stanleyville à Coquilhatville, xi.1921 (*L. Verlaine*), 1 ♀ ; Yumbi [1°53″S. 16°34″E.], 1.x.1929 (*A. J. Bredo*), 1 ♀ ; Bolombo [3°59″S. 21°24″E.], vii.1938 (*J. Ghesquière*), 1 ♀ ; Rutschuru, i.1928 (*Ch. Seydel*), 1 ♂ ; N. Kivu, Ngesho, ix.1937 (*J. Ghesquière*), 1 ♀ ; Lusambo, vii,viii (*Dr. M. Fontaine*), 3 ♀ ; Katanga, R. Lufira, 14.x.1925 (*Ch. Seydel*), 1 ♂ ; Elisabethville, iii,v (*Ch. Seydel*), 1 ♂, 2 ♀. RWANDA : Kisenyi, 20.iv.1957 (*Dr. M. Fontaine*), 1 ♀. BURUNDI : Usumbura, 900 m., vi,vii,viii (*Dr. M. Fontaine*), 3 ♀, all in Musée Royal de l'Afrique Centrale. UGANDA : Kampala, 26.vii.1925, 1 ♂ ; Entebbe (*F. J. Jackson*), 3 ♀. KENYA : (*G. W. Jeffery*), 1 ♂ ; Kibwezi, v.1922 (*W. Feather*), 1 ♀. Suna, Kavirondo, iv.1932 (*W. Feather*), 1 ♂. TANZANIA : Shinyanga, Mwandui, iii.1952 (*Capt. Croft*), 1 ♂. MOZAMBIQUE : Lorenzo Marques (Distant coll.), 1 ♂. S. RHODESIA : Victoria Falls, rain forest, 22.vii.1949 (*H. B. D. Kettlewell*), 1 ♂.

Cleora rothkirchi amydropa ssp. n.

(Pl. 14, figs. 388–391 ; Map 8)

Boarmia acaciaria sensu Hampson, 1903 : 330.

♂ ♀. Differs from the nominate subspecies and from subsp. *insularum* in both sexes in the generally grey and not pinkish buff or ochraceous buff colour of the vestiture and upper surface of the wings (Pl. 14, figs. 388, 390). The under surface of the wings differs in being white, patterned with fuscous black (Pl. 14, figs. 389, 391).

Measurements. ♂ 34–38 mm. ; ♀ 38–43 mm.

Forms comparable with abs. *flavipleta* and *fumata* of *tulbaghata* also occur in this subspecies. Five specimens from the northern part of the Kenya coast are closely

similar to those of the type series from the island of Socotra and they have been tentatively associated with this subspecies, though excluded from the type series.

Distribution (Map 8). Socotra ; ? N. Kenya Coast.

Holotype ♂. SOCOTRA : Deneghan, 300 ft., 14.iii.1953 (*G. Popov*), genitalia slide Geometridae No. 2194.

Paratypes : data as holotype, 6 ♂, 3 ♀ ; Ahdo Dimellus, 3000 ft., 8–15.ii.1899 (*W. R. O. Grant*), 1 ♂, 2 ♀.

Other material. KENYA : Mombasa Island, 1–7.x.1903 (*F. J. Jackson*), 1 ♂ ; Mombasa, vi.1916 (*van Someren*), 1 ♀ ; Diani, 15 mls. S. of Mombasa, iv.1953 (*N. Mitton*), 1 ♂, all in British Museum (Natural History) ; Kenya coast, Shimba Hills, xii.1961 (*R. H. Carcasson*), 1 ♀ ; Kenya coast, Gazi Forest, xii.1961 (*R. H. Carcasson*) 1 ♀, both in Coryndon Museum.

Cleora rothkirchi insularum ssp. n.

(Pl. 14, figs. 386, 387 ; Map 8)

♂ ♀. Differs from the nominate subspecies in both sexes in its smaller size and in the generally more ochraceous colour of the upper surface of the wings (Pl. 14, figs. 386, 387).

Measurements. ♂ 30–35 mm. ; ♀ 33–35 mm.

Five specimens from the Comoro Islands are provisionally associated with subspecies *insularum*, but are excluded from the type series. One male from Anjouan, a male from Grande Comore and a male from Moheli agree well with the type series from Madagascar. The female from Mayotte (38 mm. wing-span) is similar to the nominate subspecies and the second male from Anjouan is similar to a small subsp. *amydropa*.

Distribution (Map 8). Madagascar ; ? Comoro Is.

Holotype ♂. MADAGASCAR : Diego Suarez, iii–iv (*G. Melou*), genitalia slide Geometridae No. 2181.

Paratypes : MADAGASCAR : Diego Suarez, 21–23.iv.1917, 1 ♂, 4 ♀ ; ibid., 3.v. 1917, 1 ♂ ; ibid., 8–24.vii.1917, 1 ♂, 2 ♀ ; ibid., 23.viii.1917, 1 ♂ ; Lambomakandro, Sakaraha, Tulear, iii.1935 (*R. Catala*), 1 ♀ ; Mananjara, xi.1918, 6 ♂.

Other material. COMORO Is. : Anjouan I., 26–30.vi.1911 (*G. F. Leigh*), 1 ♂ ; ibid., iv–vii.1951 (*Behagel*), 1 ♂ ; Grande Comore, 1884 (*L. Humblot*), 1 ♂, 1 ♀ ; Moheli, Fomboni, 10 m., ix.1958 (*P. Griveaud*), 1 ♂ ; Mayotte, Chingoni, 70 m., x.1958 (*P. Griveaud*), 1 ♀.

CHECK LIST OF SPECIES INCLUDED IN *CLEORA*

CLEORA, Curtis, 1825
- *Cerotricha* Guenée, 1857
- *Barsine* Meyrick, 1883
- *Meyrickia* Butler, 1884
- *Chogada* Moore, 1887
- *Carecomotis* Warren, 1896
- *Neocleora* Janse, 1932

cinctaria cinctaria (Denis & Schiffermüller, 1775)
- *pascuaria* (Brahm, 1791)
- *consimilaria* (Duponchel, 1829)

cinctaria bowesi Richardson, 1952
cinctaria insolita (Butler, 1878)
sublunaria (Guenée, 1857)
- *transfixaria* (Walker, 1860)
- *atrolinearia* Hulst, 1888
- *areataria* Broadwell, 1907

projecta (Walker, 1860)
- *manitoba* (Grossbeck, 1911) **syn. n.**

nigrofasciaria (Leech, 1897)
leucophaea (Butler, 1878)
- *elegans* (Oberthür, 1884)
- *pagina* (Wileman, 1911)

venustaria (Leech, 1891)
alienaria alienaria (Walker, 1860)
alienaria gelidaria (Walker, 1863)
alienaria rasanaria (Swinhoe, 1915)
alienaria fumipennis Prout, 1929
fraterna (Moore, 1888)
determinata (Walker, 1860)
yakushimana (Inoue, 1956)
minutaria (Leech, 1891)
hermaea Prout, 1929
subbarbaria Prout, 1929
sevocata Prout, 1929
hospita (Prout, 1916)
illustraria illustraria (Walker, 1863)
illustraria anestiaria (Swinhoe, 1915)
illustraria crina Prout, 1929
illustraria aequivoca Prout, 1929
apista Prout, 1929
meceoscia Prout, 1929
mecistoscia Prout, 1929
paepalima West, 1932
tella (West, 1929)
pendleburyi Prout, 1929
xanthorrhages Prout, 1929
mjoebergi Prout, 1926
neomenia Prout, 1932
repetita (Butler, 1882)
- *inflexaria* (Snellen, 1881)
- *epistictis* (Meyrick, 1889)
- *proletaria* (Swinhoe, 1915)

lipotera West, 1920
processaria (Walker, 1860)
nigronotaria (Wileman, 1911) **comb. n.**
injectaria injectaria (Walker, 1860)
- *sublectaria* (Walker, 1863)
- *compactaria* (Walker, 1863)

injectaria fuliginosa (Warren, 1894)
injectaria vittata (Warren, 1899)
injectaria dobboensis Prout, 1929
injectaria anidryta Prout, 1929
idiocrossa Turner, 1918
concentraria concentraria (Snellen, 1877)
- *? invalidaria* (Snellen, 1895)

concentraria praia Prout, 1928
concentraria inobeda Prout, 1929
godeffroyi (Butler, 1886)
psectra Fletcher, 1957
samoana (Butler, 1886)
collenettei Prout, 1929
esoterica Prout, 1929
- f. *pusillanimis* Prout, 1935

myrmidonaria (Guenée, 1857)
leucostigma Prout, 1929
tongaica (Butler, 1886)
vitensis (B.-Baker, 1905)
psychastis (Meyrick, 1886)
immemorata (Walker, 1863)
- *lichenina* (Butler, 1877)

munditibia Prout, 1927
stenoglypta Prout, 1929
licornaria Guenée, 1857
dodonaeae Prout, 1929
cheesmanae Prout, 1929
nausori (B.-Baker, 1905)
perstricta Prout, 1934
scriptaria (Walker, 1860)
- *panagrata* (Walker, 1862)
- *stigmaticata* (Walker, 1862)
- *menanaria* (Walker, 1863)
- *antipodaria* (Felder, 1874)
- *arenacea* (Butler, 1879)
- *desiccata* (Butler, 1879)

perlepidaria (Warren, 1900)
compectinata (Warren, 1906)
displicata (Walker, 1860)
pheucta Prout, 1937
goldfinchi Prout, 1937
diphasia diphasia Prout, 1937
diphasia refota Prout, 1937

rhadia rhadia Prout, 1929
rhadia frigescens Prout, 1937
perbona Prout, 1937
lacteata (Warren, 1897)
decisaria (Walker, 1866)
amphidoxa Prout, 1937
callicrossa (Meyrick, 1889)
nigristigma nigristigma Prout, 1937
nigristigma talaseensis Prout, 1937
hemiopa hemiopa Prout, 1928
hemiopa quirosi Prout, 1929
hemiopa ecdees Prout, 1929
ictuibasis Prout, 1937
cucullata cucullata (Fletcher, 1953)
cucullata fusconebulata (Fletcher, 1953)
monodactyla (Fletcher, 1953)
purissima (Fletcher, 1953)
batillata (Fletcher, 1953)
onycha onycha (Fletcher, 1953)
onycha amplissima (Fletcher, 1953)
onycha hastata (Fletcher, 1953)
onycha cultrata (Fletcher, 1953)
onycha serrata (Fletcher, 1953)
onycha limitata (Fletcher, 1953)
onycha acuata (Fletcher, 1953)
taprobana (Fletcher, 1953)
kalisi (Fletcher, 1953)
biclavata (Fletcher, 1953)
inornata (Fletcher, 1953)
fasciata (Fletcher, 1953)
olivata (Fletcher, 1953)
cornaria (Guenée, 1857)
    invectaria (Walker, 1860)
    properata (Walker, 1860)
repulsaria (Walker, 1860)
propulsaria propulsaria (Walker, 1860)
propulsaria fieldi (Fletcher, 1953)
olivomaculata (Fletcher, 1953)
rostrata rostrata (Fletcher, 1953)
rostrata moniliata (Fletcher, 1953)
falculata (Fletcher, 1953)
tenebrata tenebrata (Fletcher, 1953)
tenbrata acutiorata (Fletcher, 1953)
tenebrata arcuata (Fletcher, 1953)
tenebrata buruensis (Fletcher, 1953)
tenebrata fumata (Fletcher, 1953)
tenebrata parviorata (Fletcher, 1953)
inoffensa inoffensa (Swinhoe, 1902)
inoffensa cinereomarginata (Fletcher, 1953)
inoffensa glaucata (Fletcher, 1953)
inoffensa celebesa (Fletcher, 1953)
inoffensa minorata (Fletcher, 1953)
inoffensa exsilata (Fletcher, 1953)
indigna (Fletcher, 1953)
costiplaga costiplaga (Fletcher, 1953)
costiplaga flaviorata (Fletcher, 1953)
costiplaga ferrata (Fletcher, 1953)
costiplaga eichhorni (Fletcher, 1953)
costiplaga umbrata (Fletcher, 1953)
pupillata pupillata (Walker, 1860)
pupillata fuliginata (Fletcher, 1953)
pupillata luzonensis (Fletcher, 1953)
buxtoni (Fletcher, 1953)
perfumosa extendata (Fletcher, 1953)
perfumosa perfumosa (Warren, 1896)
braeckeli Debauche, 1941
forficulata (Fletcher, 1953)
levata (Fletcher, 1953)
albobrunneata albobrunneata (Fletcher, 1953)
albobrunneata cordata (Fletcher, 1953)
sabulata sabulata (Fletcher, 1953)
sabulata inconspicuata (Fletcher, 1953)
contiguata contiguata (Moore, 1867)
contiguata brooksi (Fletcher, 1953)
contiguata imparata (Fletcher, 1953)
contiguata bigladiata (Fletcher, 1953)
acaciaria (Boisduval, 1833)
transversaria (Pagenstecher, 1907)
betularia (Warren, 1897)
    funesta (Warren, 1905)
flavivenata sp. n.
melanochorda (Fletcher, 1958)
papillifer Prout, 1934
cancer sp. n.
tamsi sp. n.
viettei (Herbulot, 1958)
oculata sp. n.
prosema Prout, 1927
anacantha sp. n.
epiclithra sp. n.
carcassoni sp. n.
herbuloti herbuloti (Fletcher, 1958)
herbuloti phaea ssp. n.
acerata sp. n.
subcincta subcincta (Warren, 1901)
subcincta longifibulata (Fletcher, 1958)
lacrymata sp. n.
echinodes sp. n.
raphis sp. n.
aculeata sp. n.
panarista sp. n.
quadrimaculata (Janse, 1932)
boetschi (Herbulot, 1961)
bicornis sp. n.
dargei (Herbulot, 1961)
dactylata sp. n.

thyris sp. n.
nigrisparsalis (Janse, 1932)
tulbaghata (Felder, 1875)
plax sp. n.
munda (Warren, 1899)
lamottei (Herbulot, 1954)
toulgoetae (Herbulot, 1961)
rostella sp. n.
legrasi (Herbulot, 1955)
angustivalvis (Herbulot, 1965)
serena sp. n.
oligodranes (Prout, 1922)
macracantha (Herbulot, 1959)
derogaria (Snellen, 1872)
obsitaria (Mabille, 1890)
subspurcata (Warren, 1898)
pavlitzkiae pavlitzkiae (Fletcher, 1958)
pavlitzkiae lamella ssp. n.
pavlitzkiae etesiae ssp. n.
pavlitzkiae oriadelpha ssp. n.
pavlitzkiae saltuensis ssp. n.
lima sp. n.
scobina sp. n.
radula radula sp. n.
radula leptopasta ssp. n.
radula arenosa ssp. n.
radula eumelana ssp. n.
rothkirchi rothkirchi (Strand, 1914)
rothkirchi amydropa ssp. n.
rothkirchi insularum ssp. n.

SPECIES TO BE MOVED FROM *CLEORA* WHEN GENERA ARE AVAILABLE

Cleora albitrigonis Prout, 1927, *Trans. ent. Soc. Lond.* **75** : 195, pl. 20 : 13.
Cleora argicerauna Prout, 1929, *Treubia* **7** : 448, pl. 9 : 14.
Cleora atriclava Prout, 1926, *Novit. zool.* **33** : 183.
Cleora bathyscia Turner, 1917, *Proc. Linn. Soc. N.S.W.* **42** : 371.
Cleora cnephaea Prout, 1915, *Novit. zool.* **22** : 359.
Cleora cryptogonia Prout, 1927, *J. Bombay nat. Hist. Soc.* **31** : 941, pl. 2 : 7.
Cleora discipuncta Joicey & Talbot, 1917, *Ann. Mag. nat. Hist.* (8) **20** : 74, pl. 4 : 8.
Cleora euboliaria (Walker), Turner, 1917, *Proc. Linn. Soc. N.S.W.* **42** : 372.
Tephrosia? euboliaria Walker, 1860, *List Lep. Ins. B.M.* **21** : 419.
Cleora euplates Prout, 1925, *Trans. ent. Soc. Lond.* **1925** : 315, pl. 36 : 26.
Cleora expleta Prout, 1932, *Jl. fed. Malay St. Mus.* **17** : 105, pl. 11 : 25.
Cleora fenestrata Prout, 1916, *Novit. zool.* **23** : 52.
Cleora flaccida (Warren), Joicey & Talbot, 1917, *Ann. Mag. nat. Hist.* (8) **20** : 74.
Alcis flaccida Warren, 1903, *Novit. zool.* **10** : 388.
Cleora flaccida constricta Joicey & Talbot, 1917, *Ann. Mag. nat. Hist.* (8) **20** : 74, pl. 4 : 16.
Alcis cinnamomea Rothschild, 1915, *Lepidoptera Brit. Ornith. Union Exped. S. Dutch New Guinea*, 86.
Cleora gypsochroa Turner, 1947, *Proc. R. Soc. Qd* **58** : 91.
Cleora hoplogaster Prout, 1916, *Novit. zool.* **23** : 51.
Cleora inaequipicta Prout, 1921, *Bull. Hill Mus. Witley* **1** : 150, pl. 18 : 14.
Cleora incompletaria (Guenée), Vinson, 1938, *Bull. Maurit. Inst.* **1**(4) : 38.
Boarmia incompletaria Guenée, 1862, *in* Maillard, *Notes sur l'île de la Réunion*, Annexe G, 27.
Cleora nesiotis Turner, 1926, *Pap. Proc. R. Soc. Tasm.* **1925** : 99.
Cleora orygaria (Guenée), Vinson, 1938, *Bull. Maurit. Inst.* **1**(4) : 38.
Neocleora orygaria brunneata (Warren) Herbulot, 1956, *Naturaliste malgache* **8** : 252.
Xylopteryx brunneata Warren, 1912, *Novit. zool.* **9** : 523.
Cleora polymiges Prout, 1926, *Novit. zool.*, **33** : 22.
Cleora proemia Prout, 1917, *Novit. zool.* **24** : 435.
Neocleora refulgens Herbulot, 1965, *Bull. Soc. ent. Fr.* **69** : 258.
Boarmia (*Cleora*) *rhamphoides* Wehrli, 1943, *in* Seitz, *Macrolepidoptera of the World* **4**, Suppl., 494.
Cleora russoi Prout, 1932, *Rev. Zool. Bot. afr.* **21** : 244.
Cleora scripta Joicey & Talbot, 1917, *Ann. Mag. nat. Hist.* (8) **20** : 74, pl. 3 : 7.
Cleora semidiscata (Warren) Warren, 1907, *Novit. zool.* **14** : 172.
Chogada semidiscata Warren, 1906, *Novit. zool.* **13** : 141.

Cleora subnigrata (Warren) Prout, 1927, *J. Bombay nat. Hist. Soc.* **31** : 942, pl. 2 : 7.
Scotopteryx? subnigrata Warren, 1901, *Novit. zool.* **8** : 34.
Cleora tora Prout, 1926, *Novit. zool.* **33** : 183.
Cleora trigrapta Prout, 1927, *J. Bombay nat. Hist. Soc.* **31** : 940.
Cleora trisinuata Warren, 1898, *Novit. zool.* **5** : 248.
Cleora vatia Prout, 1927, *J. Bombay nat. Hist. Soc.* **31** : 941.

SPECIES MOVED FROM *CLEORA* TO OTHER GENERA

Cleora aargostigma Prout, 1927, *J. Bombay nat. Hist. Soc.* **31** : 939 moved to *Alcis*. **Comb. n.**
Cleora aeglophanes Prout, 1926, *Sarawak Mus. J.* **3**(2) : 203 ; 1928, op. cit., pl. 16 : 9, moved to *Alcis*. **Comb. n.**
Cleta albipunctaria Schaus, 1901, *Trans. Am. ent. Soc.* **27** : 241, treated by Prout as *Cleora*, moved to *Stellidia* in the Noctuidae. **Comb. n.**
Cleora amictozona Prout, 1932, *Novit. zool.* **38** : 114 moved to *Alcis*. **Comb. n.**
Cleora antelmaria (Mabille) ; Vinson, 1938, *Bull. Maurit. Inst.* **1**(4) : 38.
Boarmia antelmaria Mabille, 1893, *Ann. Soc. ent. Belg.* **37** : 64.
Chogada marmorata Warren, 1897, *Novit. zool.* **4** : 247 moved to *Ascotis*. **Comb. n.**
Cleora athola Prout, 1926, *Novit. zool.* **33** : 183 moved to *Alcis*. **Comb. n.**
Cleora bianquita Schaus, 1901, *Trans. Am. ent. Soc.* **27** : 182 moved to *Vinemina*. **Comb. n.**
Cleora chionospila Turner, 1947, *Proc. R. Soc. Qd* **58** : 90 moved to *Parathemis* and placed in the synonymy of *Tephrosia externaria* Walker, 1866. **Syn. n.**
Cleora cockaynei Prout, 1916, *Novit. zool.* **23** : 53 moved to *Alcis*. **Comb. n.**
Cleora colorifera Prout, 1916, *Novit. zool.* **23** : 53 moved to *Alcis*. **Comb. n.**
Cleora coniozona Prout, 1927, *J. Bombay nat. Hist. Soc.* **31** : 940, pl. 2 : 3 moved to *Alcis*. **Comb. n.**
Cleora decussata Moore, 1867, *Proc. zool. Soc. Lond.* **1867** : 628, pl. 33 : 4 moved to *Alcis*. **Comb. n.**
Cleora derivata Prout, 1926, *Sarawak Mus. J.* **3**(2) : 203 moved to *Alcis*. **Comb. n.**
Cleora dolichoptila Turner, 1947, *Proc. R. Soc. Qd* **58** : 91 moved to *Chlenias*. **Comb. n.**
Boarmia (*Cleora*) *flavolinearia* (Leech) ; Wehrli, 1954, *in* Seitz, *Macrolepidoptera of the World* **4**, Suppl., 720.
Boarmia flavolinearia Leech, 1891, *Entomologist* **24**, Suppl., 47 moved to *Alcis*. **Comb. n.**
Boarmia (*Cleora*) *fortunata* (Blachier) ; Wehrli, 1943, *in* Seitz, *Macrolepidoptera of the World* **4**, Suppl., 494.
Boarmia fortunata Blachier, 1887, *Feuille jeun. Nat.* **17** : 103.
Boarmia obscura B.-Baker, 1891, *Trans. ent. Soc. Lond.* **1891** : 218.
Boarmia wollastoni B.-Baker, 1891, *Trans. ent. Soc. Lond.* **1891** : 217 moved to *Ascotis*. **Comb. n.**
Boarmia buechlei Kilian, 1897, *Societas ent.* **12** : 41.
Cleora glaucotoxa Prout, 1927, *Trans. ent. Soc. Lond.* **75** : 195, pl. 20 : 12 moved to *Ascotis*. **Comb. n.**
Cleora godmani Druce, 1892, *Biologia cent.-am., Zool., Lep. Het.* **2** : 72, pl. 48 : 9 moved to *Semiothisa*. **Comb. n.**
Cleora gracilis Warren, 1904, *Novit. zool.* **11** : 107 moved to *Iridopsis*. **Comb. n.**
Cleora hemichroma Turner, 1947, *Proc. R. Soc. Qd* **58** : 89 moved to *Chlenias*. **Comb. n.**
Cleora hemiphanes Prout, 1925, *Novit. zool.* **32** : 56 moved to *Alcis*. **Comb. n.**
Cleora hypopoecilia Prout, 1928, *Bull. Hill Mus. Witley* **2** : 151 moved to *Alcis*. **Comb. n.**
Cleora imbecilis (Moore) ; Prout, 1927, *J. Bombay nat. Hist. Soc.* **31** : 939.
Pseudocoremia imbecilis Moore, 1888, *Descr. New Indian Lepidopterous Insects in coll. Atkinson*, 241 moved to *Alcis*. **Comb. n.**
Cleora irrita Prout, 1928, *Bull. Hill Mus. Witley* **2** : 152 moved to *Alcis*. **Comb. n.**
Cleora irrita f. (?sp.) *obruta* Prout, 1928, loc. cit.

Cleora latifasciata (Warren) ; Prout, 1927, *J. Bombay nat. Hist. Soc.* **31** : 938.
Poecilalcis latifasciata Warren, 1893, *Proc. zool. Soc. Lond.* **1893** : 427.
Boarmia euryzona Hampson, 1895, *Fauna Br. India, Moths* **3** : 281.
Boarmia eurydiscaria Hampson, 1902, *J. Bombay nat. Hist. Soc.* **14** : 507 moved to *Alcis*. **Comb. n.**
Cleora megaspilaria Moore, 1867, *Proc. zool. Soc. Lond.* **1867** : 629 moved to *Alcis*. **Comb. n.**
Cleora nigridorsaria Guenée, 1857, *Histoire naturelle des Insectes, Species général des Lépidoptères* **9** : 232 moved to *Alcis*. **Comb. n.**
Cleora nigriscripta (Warren) ; Prout, 1929, *Bull. Hill Mus. Witley* **3** : 38, 51.
Poecilalcis nigriscripta Warren, 1903, *Novit. zool.* **10** : 401.
Cleora nigriscripta gavisa Prout, 1929, *Bull. Hill Mus. Witley* **3** : 38.
Cleora nigriscripta plenimedia Prout, 1929, *Bull. Hill Mus. Witley* **3** : 51 moved to *Alcis*. **Comb. n.**
Cleora pachydesma Turner, 1947, *Proc. roy. Soc. Qd* **58** : 90 moved to *Symmetroctena*. **Comb. n.**
Cleora periphracta Prout, 1926, *Sarawak Mus. J.* **3**(2) : 202 moved to *Alcis*. **Comb. n.**
Cleora phaeocala Turner, 1947, *Proc. R. Soc. Qd* **58** : 91 moved to *Chlenias*. **Comb. n.**
Cleora praecisa Turner, 1917, *Proc. Linn. Soc. N.S.W.* **42** : 372 moved to *Syneora*. **Comb. n.**
Cleora praevariegata Prout, 1926, *Sarawak Mus. J.* **3**(2) : 202; 1928, **3**(3), pl. 16 : 8 moved to *Alcis*. **Comb. n.**
Cleora rufomarginata Moore, 1867, *Proc. zool. Soc. Lond.* **1867** : 628 moved to *Alcis*. **Comb. n.**
Boarmia (*Cleora*) *scortea* (Bastelberger); Wehrli, 1943, in Seitz, *Macrolepidoptera of the World* **4**, Suppl., 494.
Boarmia scortea Bastelberger, 1909, *Ent. Z.* Frank.a.M. **23** : 33 moved to *Alcis*. **Comb. n.**
Cleora semiochrea Prout, 1917, *Novit. zool.* **24** : 315 moved to *Alcis*. **Comb. n.**
Cleora semipullata Prout, 1925, *Novit. zool.* **32** : 57 moved to *Alcis*. **Comb. n.**
Cleora sericea (Warren); Prout, 1927, *J. Bombay nat. Hist. Soc.* **31** : 942.
Apophyga sericea Warren, 1893, *Proc. zool. Soc. Lond.* **1893** : 418 removed to *Apophyga*.
Cleora terebraria (Guenée) Vinson, 1938, *Bull. Maurit. Inst.* **1**(4) : 38.
Hypopalpis terebraria Guenée, 1862, in Maillard, *Notes sur l'île de la Réunion, Annexe G*, 29.
Boarmia perforaria Guenée, 1862, op. cit., p. 30, pl. 23 : 4.
Boarmia rousseli Oberthür, *Études Lép. comparées* **7** : 275, pl. 169 : 1652, 1653 moved to *Ascotis*. **Comb. n.**
Cleora variegata (Moore); Prout, 1927, *J. Bombay nat. Hist. Soc.* **31** : 938.
Pseudocoremia variegata Moore, 1888, *Descr. New Indian Lepidopterous Insects in coll. Atkinson*, 240.
Cleora nebulosa Swinhoe, 1891, *Trans. ent. Soc. Lond.* **1891** : 488.
Cleora variegata convariata Prout, 1935, *Novit. zool.* **39** : 231 moved to *Alcis*. **Comb. n.**
Cleora versicolor Prout, 1915, *Sarawak Mus. J.* **2**(2) : 181 moved to *Alcis*. **Comb. n.**
Cleora venustularia Walker, 1866, *List Lep. Ins. B.M.* **35** : 1579 moved to *Alcis*. **Comb. n.**

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