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LEADER: CHRISTIAN VIBE

THE LEPIDOPTERA OF GREENLAND

BY

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WITH 55 FIGURES IN THE TEXT
AND 21 PLATES

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Abstract

The paper presents an up-to-date survey of all species of Lepidoptera known to occur in Greenland. As a number of species included in previous lists have proved to be incorrectly identified, the taxonomical status of each species accepted in the present list has been studied carefully, preferably by means of examination of the genitalia. The list is accompanied by photographs of the adults and, in all cases where it has been found useful, of the genitalia as well.

As the insect fauna of Greenland is extremely limited, the list comprises but 52 species, among them hardly more than 41 indigenous Greenland Lepidoptera. Two species, one belonging to the family *Tortricidae*, the other to the family *Gelechiidae*, are described as n.spp. The occurrence in Greenland of each species listed is illustrated on a separate map.

The previous distinction between "western" and "eastern" species occurring on either side of a line drawn from Kap Farvel in the south to Nordostrundingen in the northeast is quite unnatural, whereas a line running from a point south of Scoresbysund in the east to south of Dundas in the northwest seems to form a natural boundary for the distribution of a certain group of species limited to North and East Greenland.

Conditioned by the geographical situation of Greenland, the terrestrial fauna comprises nearctic as well as palaearctic elements. Its insect fauna as a whole is often regarded as mainly palaearctic, an assumption which, however, is far from being supported by an analysis of the zoogeographical position of the faunal components within the Greenlandic Lepidoptera. While 39 % of the Lepidoptera must be counted as holarctic or circumpolar forms, the palaearctic share amounts to only 15 %, but the nearctic element to no less than 46 %.

Concerning the ways in which the nearctic taxa may have migrated into Greenland, attention is drawn to dispersal through the air as a highly important factor.

INTRODUCTION

"More than 20 years have passed since the most recent list of Greenland insects appeared. During that time so much collecting work has been done that a supplement is needed."

These words introduced the "Revised Index of the Insects of Grønland" compiled by HENRIKSEN (1939).

Again more than 20 years have elapsed since that list appeared, and again a supplement is needed.

In recent years travelling to and in Greenland has become greatly facilitated and it is to be expected that in future an increasing number of collectors will contribute to the exploration of the insect fauna of Greenland. An up-to-date survey covering the Lepidoptera especially, will therefore be called for.

As a supplement merely stating the new localities noted since 1939 for each species will hardly satisfy requirements, I have preferred to give an annotated list of the entire number of Lepidoptera known at present to occur in Greenland.

The 1939-list added 11 species of Lepidoptera to the 1917-list (HENRIKSEN & LUNDBECK), thus enumerating a total of 54 species. The present list contains but 52 species, thus reducing the number of species by 2, as compared with the 1939-list, although collecting during the period 1939–1963 has added 8 species not known to occur in Greenland in 1939.

This unexpected result is due to the fact that a revision of the material upon which the 1939-list is based, has brought to light the fact that a number of species included were incorrectly identified. Each of 4 species thus occurred twice, and one species three times in the list under different names. In addition the list contained certain species the occurrence of which—as also mentioned by HENRIKSEN (1939)—seems doubtful, as well as some dubious species which probably had better be regarded as synonyms of other species listed. As the claim of dependability of such a list must be given preference to completeness, the latter species have been omitted in the present list.

The purpose of the revision being to settle with certainty what species are at present known to have been found in Greenland, the

identity of each species included has been studied again, preferably by examination of the genitalia. As an aid the list is accompanied by photographs of almost every indigenous species. Moreover, a photograph of the genitalia of a Greenland specimen has in most cases been added, or a reference given to such an illustration if previously published on the basis of Greenland material.

In cases where a species appears in the list under a "new" specific name, the reasons for arriving at this name are explained in detail.

The species collected since 1939 and not included in the previous list are: *Lycaena phlaeas* L., *Tehama bonifatella* HULST, *Plodia interpunctella* HB., *Nomophila noctuella* DEN. & SCHIFF., *Bryotropha similis* STT., *Agonopteryx victori* DE LESSE & VIETTE, *Plutella maculipennis* CURT., and *Monopis rusticella* HB.

The following 13 species appeared incorrectly as identified in the list: *Euxoa dissona* MÖSCHL. (= *Chorizagrotis drewseni* STAUD.), *Polia nana* HUFN. (= *Apamea exulis* LEF.), *Syngrapha interrogationis* L. (= *S. u aureum* GUEN.), *Cheimatobia brumata* L. (= *Operophtera bruceata* HULST), *Eupithecia nanata* HB. (= *E. gelidata* MÖSCHL.), *Eupithecia ?altenaria* STAUD. (= *E. sobrinata* HB.), *Ephestia kühniella* ZELL. (= *E. elutella* HB.), *Pterophorus monodactylus* L. (= *Stenoptilia islandica* STAUD.), *Acalla maccana* TR. (= *Acleris boreana* n. sp.), *Cnephasia hoyosi* RBL. (= *Argyroploce inquietana* WLK.), *Argyroploce groenlandicana* B.-H. (= *Olethreutes mengelana* FERN.), and *Eucosma petalonata* MEYR. (= *Epinotia indecorana* ZETT.).

A study of the Greenland material recorded under the name of *Phthorimaea charcoti* MEYR. has shown, partly that *charcoti* MEYR. is a synonym of *valesiella* STAUD., partly that two separate species, viz. *valesiella* STAUD. and *vibei* n. sp. were included.

Finally *Syngrapha diasema* var. *borea* AURIV. has proved to be a valid species instead of being conspecific with *S. diasema* BDV.

The species omitted are: *Arctiinae* sp. (several larvae found under stones in Jameson Land, E. Greenland, (LACK 1934: 605) were doubtfully referred to some *Arctia* sp.), *Rhyacia plecta* L. (a perfect specimen of this species—superficially not unlike *Euxoa westermanni* STAUD.—ex coll. WESTERMANN is no doubt wrongly labelled: "Grønland"), *Anarta squara* SCHMIDT (without locality; according to its author's description and added remarks most probably identical with *A. leucocycla* STAUD.), *Sympistis besla* SKINN. & MENGEL (only a single specimen known, by its authors suggested to be a form of *S. zetterstedtii* STAUD.), *Cidaria immaculata* SKINN. & MENGEL (according to DYAR 1902: 287) a form of *Psychophora sabinii* KIRBY), and *Stenoptilia mengeli* FERN. (no doubt conspecific with the other Greenland *Stenoptilia* specimens, viz. *S. islandica* STAUD.).

In the handbooks (SEITZ, etc.) the recorded distribution of certain species may include Greenland even in cases in which no previous record seems to exist. Such records are not accepted in the list.

The greater part of the material collected since 1939 has been procured by CHR. VIBE, who, after joining the Danish Thule and Ellesmere Land Expedition (1939–1941), spent the period during World War II in Greenland (district of Godthåb), and who since 1948, as the leader of the Zoogeographical Investigations in Greenland, has made collections in various parts of West, East, and North Greenland. CHR. VIBE has been assisted by Greenlandic companions, especially by MARIUS ABELSEN (Godthåb). The material belongs to the Zoological Museum of Copenhagen.

The Zoogeographical Investigations in Greenland have also received valuable contributions from TORBEN ANDERSEN, who in 1954 collected insects in the south-western districts and in 1958 in Middle East Greenland.

PALLE JOHNSEN and BØRGE FRISTRUP, taking part in the 1st Danish Peary Land Expedition (1947–1950), collected Lepidoptera in the far North at about 82° (Heilprinland and environs). This material is also in the Zool. Mus. Copenhagen.

During the 2nd French Polar Expedition (Missions Paul-Emile Victor) in 1949 H. DE LESSE collected insects most carefully during the period 29th May–18th August at Eqe, situated at 69°45′ on the west coast close to the ice-cap, and brought home 802 Lepidoptera covering 24 species. The material is preserved in France, and the results of his collecting have been published in French periodicals (e. g. DE LESSE & VIETTE 1949, DE LESSE 1949–50, 1951).

The Icelandic entomologist HÁLFDAN BJÖRNSSON (Kvísker, Öræfi, Iceland) collected Lepidoptera at Mesters Vig in East Greenland during the period 2nd June–12th July 1955. Dr. FINNUR GUÐMUNDSSON has been kind enough to permit me to examine this material—amounting to over 200 specimens comprising 22 species—which is preserved in the Natural History Museum of Reykjavík.

In 1955 T. FEDDERSEN during his service as a medical officer in the Royal Danish Navy was active as a collector of Lepidoptera at Grønnedal (southwestern district) and brought home a collection now in the possession of the Zoological Museum of Copenhagen.

In late summer 1962 (10th August–4th September) the present author collected Lepidoptera in the central west district (Søndre Strømfjord and Arktisk Station, Disko), and in Southwest Greenland. The material—a considerable part of which was selected from the great number of specimens that years ago had flown into lighted rooms through open windows and now were found dead (although often in excellent condition) indoors in empty buildings, especially in the former

U.S.A. military hospital, at Narssarssuaq—amounts to 582 set specimens covering 21 species, and is included in the collections of the Zoological Museum of Copenhagen.

Returning from the 2nd Danish Peary Land Expedition (1963) B. FREDSKILD, the botanist of the expedition, brought home a small batch of fine specimens of Lepidoptera covering 10 species collected during the period 3rd June–4th August under arduous weather conditions in the vicinity of Jørgen Brønlund Fjord (82°10′–82°15′). The material has been presented to the Zoological Museum of Copenhagen.

During the period 1948–1963 a few visitors, having had no intention to carry out zoological studies but having been asked to look for insects during their stay in Greenland, have also on occasions collected some Lepidoptera.

The entire material preserved in the Zoological Museum of Copenhagen has been examined as far as concerns the adults, while the large number of larvae kept in alcohol (except those of *Gynaephora groenlandica* WOCKE) still awaits treatment.

The localities for each species plotted on the maps, showing the distribution of the species in Greenland, are those appearing from the above material together with those mentioned in the literary sources.

If a species is known from several places in West or East Greenland respectively, the name of each separate locality is not mentioned, but the names and the geographical situations of the southernmost and the northernmost place, respectively, are stated. Concerning North Greenland the names of all localities situated north of 80° lat. N. are mentioned, the order being west towards east.

For each species the months of appearance of the adults is stated. Such records can only be approximate owing to the considerable difference in the dates of appearance in an "early" and in a "late" season in Greenland. Moreover, the insects as a whole appear later on the east coast, and their time of appearance is far more condensed, than in the west or the south.

Mention of the plants feeding the larvae is based exclusively on observations made in Greenland.

The microscope slides (all except two) have been prepared by the author. All photographs have been taken by Mr. H. V. CHRISTENSEN of the Zoological Museum of Copenhagen.

The illustrations in the text are drawn by the author.

Literary references have been restricted as much as possible. Detailed references have already been given by e. g. HENRIKSEN & LUNDBECK (1917), KNABEN (1937), and HENRIKSEN (1939).

The sequence of the species follows that adopted by The Zoological Record. The generic names are those used in today's advanced litera-

ture, but for convenience one of the older names previously used is generally added in parenthesis. The species are listed under their specific names. If it seems necessary to apply a subspecies name to the Greenland population of certain species, this name is mentioned. Naming of individual "aberrations"—of which a great variety occur in Greenland —is consistently avoided.

I am greatly indebted to Mr. E. Taylor (Hope Department of the University of Oxford), Dr. H. J. Hannemann (Zoological Museum of the Humboldt University of Berlin), and Professor C. H. Lindroth (Zoological Institution of the University of Lund, Sweden) for loan of type material, to Mr. J. D. Bradley (British Museum, Natural History, London) for loan of specimens and study of Greenland material preserved in London, to Dr. Harry Krogerus (Helsingfors) for material and information concerning Lepidoptera collected by him in Newfoundland, to Dr. Walter Hackman (Zoological Museum of Helsingfors), Dr. Finnur Guðmundsson (Natural History Museum of Reykjavík), Mr. Ingvar Svensson (Österslöv, Sweden), Dr. Nils Knaben (Zoological Museum of the University of Oslo), Professor Max von Schantz (Helsingfors), Mr. C.-G. Wahlström (Växjö, Sweden), Mr. Tage Jensen (Ulse, Denmark) for material, to Professor Alexander B. Klots (American Museum of Natural History, New York), Mr. D. C. Ferguson (formerly Nova Scotia Museum of Science, Halifax, Canada, at present Peabody Museum, Yale University, New Haven, Connecticut, U.S.A.), and Mr. Magne Opheim (Oslo) for valuable information, and not least to Professor R. Spärck (University of Copenhagen) and Dr. S. L. Tuxen (Zoological Museum of Copenhagen) for their kind assistance in many ways.

Finally I wish to express my sincere thanks to the Ministry of Greenland, and to the Directors of the Carlsberg Foundation for financial support making my investigations in Greenland possible.

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SYNOPSIS OF THE SPECIES

Nymphalidae

1. *Clossiana (Argynnis) chariclea* Schn.

Plate I: ♂ fig. 1, ♀ fig. 2, underside fig. 3.
Genitalia: ♂ Aurivillius 1890 Pl. 1 figs. 3–4, Knaben 1937 p. 16 fig. 2, ♀ de Lesse 1951 p. 75 fig. 37.

A holarctic species of a wide range in arctic and boreal North America (Alaska, British Columbia, the Rocky Mountains, Northeast Canada incl. Newfoundland, Labrador, and Ellesmere Island), Greenland, the northernmost parts of Fennoscandia, the Kola Peninsula, Novaya Zemlya, North Siberia, Kamchatka.

Occurrence in Greenland:

A common species noticed from West Greenland: between 60°43′ (Julianehåb) and 72°45′ (Upernavik). East Greenland: at 60°19′ (Nordre Bræfjord) adjoining the distribution in the southern part of West Greenland, and between 65°35′ (Tasiussaq) and 76°49′ (Stormkap). North Greenland: between 76°33′ (Dundas[1]) and 79° (Inglefield Land), and at 82°28′ (Sommerdalen in Wulff Land), 82° (Chr. Eriksens Iskappe), 82°05′ (Ítukussuk Dal), 82°10′ (Jørgen Brønlund Fjord), and 82°25′ (Erlandsen Land).

See map on p. 54 (fig. 11).

July–August.

2. *Clossiana (Argynnis) polaris* Bdv.

Plate I: ♂ fig. 4, ♀ fig. 5, underside fig. 6.
Genitalia: Knaben 1937 p. 17 fig. 3.

Holarctic, distributed in arctic and boreal North America (Alaska, Canada south to Manitoba, Labrador, Ellesmere Island), North and

[1] Note: The locality situated at about 76°33′ in the western part of North Greenland which in previous papers on the Greenland fauna is recorded as Thule is now termed Dundas. On recent official maps Thule is placed at 77°35′ on the Peninsula Qânâq. To avoid mistakes the name Thule is in the present paper replaced by Dundas or Qânâq, respectively.

East Greenland, the northernmost parts of Fennoscandia, West and Northeast Siberia.

Occurrence in Greenland:

Not found in West Greenland. East Greenland: between 69° (d'Aunay Bugt) and 76°46′ (Danmarks Havn, Rypefjeld, Hvalrosodden). In North Greenland noticed from: 81°25′ (Polaris Bugt), about 82° (Wulff Land), 82° (Heilprin Land), and 82°10′ (Jørgen Brønlund Fjord).

See map on p. 54 (fig. 12).

July–August.

Lycaenidae

3. *Lycaena (Chrysophanus) phlaeas* L.

Plate I: fig. 7.

During an arctic expedition towards the North Pole in the years 1875–1876 Captain H. W. FEILDEN on the east coast of Ellesmere Island at 81°45′ close to the northwest coast of Greenland, collected some specimens of a characteristic brassy-coloured form of *Lycaena phlaeas*, later on described as var. *feildeni* M'LACHLAN (1878 (1879): 111).

Lycaena phlaeas was not found in Greenland until CHR. VIBE on 26th August 1941 collected a specimen exactly matching this form on the Greenland side of Smith Sund, at 77°41′.

Like several other butterflies, *Lycaena phlaeas* has been divided into a number of local forms, races, subspecies, or even species. The North American population—although very much like European specimens—is often regarded as a distinct species (*hypophlaeas* BDV., *americana* (D'URBAN) HARR.). Specimens from northernmost Scandinavia (f. *borealis* COURV.), like f. *feildeni* M'LACHL., are larger and lighter in colouration than typical *phlaeas*, especially on the underside of the wings.

In the female genitalia the signum consists of two narrow, parallel bands varying in length and in degree of sclerotization. In palaearctic specimens these bands are generally—not always—conspicuous while the signum of North American specimens often appears obsolete. The signum of the Greenland specimen consists of two short and broad, very weakly sclerotized bands.

The male genitalia of all forms seem identical.

L. phlaeas is apparently a circumpolar species, distributed in arctic and boreal North America as well as in most of the palaearctic region.

Occurrence in Greenland:

Exclusively found in North Greenland: at 77°41′ (MacCormick Fjord).

See map on p. 54 (fig. 13).

August.

4. *Plebeius (Lycaena) glandon* Prunn.

Plate I: ♂ fig. 8, ♀ fig. 9, underside fig. 10.
Genitalia: ♂ Plate VII fig. 1, Knaben 1937 p. 19 fig. 4 (as *orbitulus* ab. *aquilo*).

The Greenland Blue has been listed under various specific names, thus *orbitulus* Prunn. (Henriksen & Lundbeck 1917: 671), *aquilo* Bdv. (Henriksen 1939: 26), and *glandon* Prunn. (Langer, no year stated, p. 303).

Examination of the genitalia has convinced me that those of Greenland specimens do not exhibit any differences from those of Northern Scandinavian *glandon* Prunn. (sensu Nordström & Wahlgren 1941: 30) or from those of similar looking specimens from arctic Northeast Canada, but that they are different from those of Norwegian *orbitulus* Prunn.

In a paper on the Lepidoptera of Newfoundland Krogerus (1954: 11) treats the Newfoundland species under the name of *aquilo* Bdv., pointing out that minor differences are present in the shape of the tip of valva in the male genitalia, thus apparently separating this species from the *glandon* population occurring in Finland.

I have had an opportunity to check the slides in question and to discuss the problem with Dr. Krogerus, and we have arrived at the conclusion that the differences mentioned may be due to a somewhat different position of the parts in the mounts.

The population occurring in northeastern parts of North America (including Newfoundland) is at present regarded as belonging to *glandon* Prunn. Even an examined male from Colorado looks similar to *glandon*, and I have been unable to establish genitalic differences.

Compared to the Northern Scandinavian *glandon* the underside of Greenland specimens as well as of specimens from Northeast Canada (e. g. Danish Island south of Melville Peninsula) is somewhat darker and the spots on the hind wings more distinct, but otherwise they look similar.

P. glandon is distributed in the arctic and boreal zone of North America, the northern and eastern parts of Greenland, Arctic Scandinavia and Finland, Siberia, and—at higher altitudes—in the mountains of Central Europe.

Occurrence in Greenland:

Not found in West Greenland. Noticed from East Greenland: between 70°40′ (Jameson Land) and 76°49′ (Stormkap). North Greenland: at 76°33′ (Dundas), 77°50′ (Neqe), 82°05′ (Ítukussuk Dal), and (seen) at 82°10′ (Jørgen Brønlund Fjord).

See map on p. 54 (fig. 13).

July–August.

Pieridae

5. *Colias hecla* LEF.

Plate I: ♂ fig. 11, ♀ fig. 12, dark ♀ fig. 13.
Genitalia: ♂ AURIVILLIUS 1890 Pl. 3 fig. 7, KNABEN 1937 p. 11 fig. 1, ♀ DE LESSE 1951 p. 75 fig. 38.

A holarctic species occurring in North America (Alaska, Rocky Mountains, Manitoba, Labrador, Baffin Island, Ellesmere Island), Greenland, northern Scandinavia, and Sibiria.

Greenland is the type locality of this species, although LEFEBURE —not being familiar with geographical details of remote regions like these—named it after a volcano in Iceland.

Occurrence in Greenland:

West Greenland: between 60°30′ (Lichtenau) and 72°45′ (Upernavik). East Greenland: between 68°42′ (Kap Daussy) and 76°46′ (Danmarks Havn, Rypefjeld, Hvalrosodden). North Greenland: at 76°33′ (Dundas), 77°35′ (Qânâq), 81°25′ (Polaris Bugt), 82°05′ (Ítukussuk Dal), 82°10′ (Jørgen Brønlund Fjord), and 82°25′ (Erlandsen Land).

See map on p. 54 (fig. 14).

July–August.

Phalaenidae

6. *Chorizagrotis (Euxoa) drewseni* STAUD.

Plate II: fig. 1 (holotype), figs. 2–3, Plate III figs. 7–15.
Genitalia: ♂ Plate VII fig. 4 (holotype), fig. 5, DE LESSE 1951 p. 62 fig. 17, BOURSIN 1959 Pl. 16 fig. 3, ♀ DE LESSE 1951 p. 63 fig. 19.

The status of the above species—described in 1857 from Greenland and not found elsewhere—has always been uncertain.

Although listed in the monographs (CORTI 1932 (1938): 35, MCDUNNOUGH 1950: 395–396) as a distinct species the authors mentioned are both inclined to consider this species conspecific with *Euxoa dissona* MÖSCHL.

Examination of the genitalia of the holotype of *drewseni* preserved in the Zoological Museum of Copenhagen, and of Greenland specimens recorded as *dissona* by HENRIKSEN (1939: 29) proved that all belonged to the same species. Also the Greenland specimens recorded as *Euxoa* (*Agrotis*) *islandica* STAUD. (e. g. by AURIVILLIUS 1890: 15, HENRIKSEN & LUNDBECK 1917: 678) belong here, and not to *islandica*.

As appears from Pl. VII figs. 4–5, the extension of the sacculus in the male genitalia has the edges parallel, the apex somewhat wider, rounded, and the harpe is short and curved. These features differ distinctly from those of *dissona* as figured by MCDUNNOUGH (1951: 401 E).

Attempts to subdivide the large genus *Euxoa* have so far proved difficult. The generic name *Chorizagrotis* SMITH, used by e. g. KOZHANTSCHIKOV (1937: 526–529) for the *lidia-adumbrata* group, and by BOURSIN (1959: 169–171) for *drewseni* may be accepted, whereas the name *Mesoeuxoa* introduced by CORTI (1932 (1938): 38–39) applied to species having the harpe much shorter than the extension of the sacculus, leads—as pointed out by KOZHANTSCHIKOV (1933–1934: 131)—to a most unnatural division, uniting otherwise widely separated species.

The male genitalia of *E. islandica* STAUD. (a species not found in Greenland) are of the *nigricans* type, having the extension of the sacculus long, straight, pointed, and the harpe long, slender, curved, whereas the genitalia of *drewseni* run close to those of the *adumbrata* group, as figured by NORDSTRÖM (1946:190). This group seems to comprise certain species which can hardly be regarded as conspecific, although they exhibit similar genitalia (*adumbrata*, *norvegica* STAUD.), and the name *drewseni* STAUD. must stand for the Greenland species.

The illustration (AURIVILLIUS 1890 Pl. 2 fig. 7) of the holotype of *drewseni* has led to regarding this species as a light-coloured species, but in fact *drewseni* is extremely variable as regards colouration and wing markings as well as size. Pl. II fig. 3 shows a specimen of a form of *drewseni* easily mistaken for *islandica*. Another variant of *drewseni*, strongly resembling the characteristic light-coloured form of *islandica* (which is likewise a variable species) has been pictured by AURIVILLIUS (1890 Pl. 1 fig. 5) as well as by BOURSIN (1959 Pl. 16 fig. 2). On Plate III figs. 7–15 several other forms of *drewseni* are shown.

Not noticed outside Greenland.

Occurrence in Greenland:

The exact locality of the holotype is unknown.

West Greenland: at 61°10′ (Narssarssuaq) and between 64°10′ (Qôrqut, Kapisigdlit) and 69°45′ (Ritenbenk, Eqe). East Greenland: at 72°10′ (Mesters Vig) and 73°45′ (Moskusoksefjord). Not found in North Greenland.

See map on p. 55 (fig. 15).

July–August.

7. ***Euxoa westermanni*** STAUD.

Plate II: fig. 4 (holotype), Plate III: fig. 1.
Genitalia: ♂ Plate VII fig. 2 (holotype).

This rare species—described from Greenland in 1857— has later on been established from Labrador, and arctic regions of Canada, extending down to the Rocky Mountains.

The holotype, preserved in the Zoological Museum of Copenhagen, has been depicted by AURIVILLIUS (1890: Pl. 2, fig. 8), and the illustration published by CORTI (1931 (1938): Pl. 3 l) also concerns this species.

On the other hand HAMPSON as well as WARREN (1909 (1914): 50, Pl. 11 b) erred in their conception as to *westermanni*, and the statement of DE LESSE (1951: 62) according to which he has etablished that *westermanni* does not belong to the genus *Euxoa*, but to *Amathes* HB. (generotype: *xanthographa* SCHIFF.) proves that he has not examined a true *westermanni*.

Examination of the genitalia of the holotype of *westermanni* proves that, although the outer parts of the valvæ were broken, it can be stated with certainty that the illustration shown by McDUNNOUGH (1951: 401 D) of the male genitalia of a Canadian specimen of *westermanni* is correct. Having had the microphotograph of the genitalia of the holotype of *westermanni* before him BOURSIN (1959: Pl. 16, fig. 6) also illustrates the genitalia of a true *westermanni* (from Labrador).

Occurrence in Greenland:

The exact locality of the holotype is unknown. Found in West Greenland: at 60°49′ (Igaliko Fjord, 1 specimen), 61°10′ (Narssarssuaq, 1 specimen), and at 66°49′ (Imerssuaq[1], 1 specimen). In East Greenland: at 68°05′ (Mikis Fjord, 2 specimens). Not found in North Greenland.

See map on p. 55 (fig. 16).

August–September.

8. *Caradrina (Rhyacia) quadrangula* ZETT.

Plate II: fig. 5.
Genitalia: ♂ Plate VII fig. 6, KROGERUS 1954 p. 13 fig. 8 (holotype).

The distribution of this species—described from Greenland in 1840—extends from Canada through Labrador, Nova Scotia, Newfoundland, and Greenland to Iceland.

Occurrence in Greenland:

Exclusively found in West Greenland: between 60°43′ (Julianehåb) and 70°40′ (Umanak).

See map on p. 55 (fig. 17).

July–August.

[1] According to a hitherto overlooked record (1909, Entom. Medd. 2. R. *3*:191) a specimen (in coll. KLØCKER) of this species was taken on 10th September 1906 at "Imigsussuak". The geographical position of the locality mentioned cannot be established with certainty, but it seems probable that the name in question refers the place situated at N. 66°49′, W. 52°53′, now being spelled Imerssuaq.

9. ***Eurois (Rhyacia) occulta*** L.

Plate II: figs. 6–7–8. Plate III: fig. 3.
Genitalia: ♂ Plate X fig. 1.

The Greenland specimens are smaller, the colouration duller, and the wing markings more indistinct than in specimens from North America (including Newfoundland). It seems justifiable to regard the Greenland population as a distinct geographical form, f. *implicata* LEF.

E. occulta L. is a circumpolar species of a wide range occurring in North America (Canada, United States, south at least to Colorado) as well as in the palaearctic region (from Iceland through Northern and Central Europe and Asia to Kamchatka and Japan).

Occurrence in Greenland:

Found in West Greenland: between 59°55′ (Ilua) and 67° (Søndre Strømfjord) and in the southernmost part of East Greenland: at 61°30′ (Anoritôq). Not found in North Greenland.

See map on p. 55 (fig. 18).

July–September.

The larvae are sometimes present in immense numbers, locally denuding the entire vegetation.

10. ***Spaelotis (Amphitrota) clandestina*** HARR.

Plate II: fig. 9. Plate III: fig. 2.
Genitalia: ♂ Plate VII fig. 3, ♀ Plate VIII fig. 1.

The name *unicolor* WLK. used by HENRIKSEN (1939: 31) for this species is a junior synonym of *clandestina* HARR. used by e. g. HENRIKSEN & LUNDBECK (1917: 676).

S. suecica AURIV., a species occurring in central parts of Norway, northern parts of Sweden and Finland, Northern Russia, is sometimes —thus by KROGERUS (1954: 12)—considered conspecific with *clandestina* HARR. Judging from the unfortunately sparse material of *suecica* available for study, the genitalia, however, seem to differ slightly. In the male the harpe of the valva is in *suecica* apically bulbed, in *clandestina* more or less pointed, and in the female the signa of the bursa are in *suecica* heavily sclerotized, as appears from Plate VIII fig. 2.

S. clandestina is widely distributed through the northern Atlantic United States (westwards to Rocky Mountains), Canada, Nova Scotia, Newfoundland to Greenland.

Occurrence in Greenland:

Found in West Greenland: between 60°35′ (Julianehåb) and 70° (Sarqaq), and in the southernmost part of East Greenland: at 60°50′ (Danells Fjord). Not found in North Greenland.

See map on p. 56 (fig. 19).

August.

11. ***Eumichtis (Crino) sommeri*** LEF.

Plate II: figs. 10–11, Plate III fig. 4.
Genitalia: ♂ Plate VIII fig. 3, AURIVILLIUS 1890 Pl. 3 fig. 1, DE LESSE 1951 p. 62 fig. 18, ♀ DE LESSE 1951 p. 69 fig. 29.

This species is undoubtedly extremely closely related to *E. adusta* ESP., a species inclined to split up in local races, a fact also pointed out by STAUDINGER & REBEL (1901: 171) and mentioned by DE LESSE (1951: 64–65).

Until more material has been studied, I prefer to treat *sommeri* as usual as a separate species although I have been unable to detect any appreciable difference between the genitalia of the males, nor of the females of European *adusta*, and those of *sommeri* from Greenland, Iceland or the Faroes.

Distributed in Iceland and Greenland, extending westwards to Labrador, eastwards to the Faroes.

Occurrence in Greenland:

West Greenland: between 60°43′ (Julianehåb) and 70° (Sarqaq). East Greenland: between 65°35′ (Angmagssalik) and 72°10′ (Mesters Vig). Not found in North Greenland.

See map on p. 56 (fig. 20).

June–August.

12. ***Apamea (Crymodes) exulis*** LEF.

Plate II: figs. 12–13–14. Plate III: figs. 5–6.
Genitalia: ♂ Plate X fig. 4, KNABEN 1937 p. 20 fig. 5, ♀ DE LESSE 1951 p. 63 fig. 20.

Known from the Northwest territories[1], Labrador, Ellesmere Island, Greenland, Iceland, the Faroes, the Shetlands, northern Scotland, and Spitzbergen.

Specimens from the Scandinavian Peninsula recorded as "*A. exulis*" belong to the boreo-alpine species *A. maillardi* HB.-G. According to

[1] One of the three unidentified specimens mentioned by HENRIKSEN (1937: 15), and collected 18.VII.1923 at 64° (Chesterfield) during the 5th Danish Thule Expedition to Arctic North America, belongs to *A. exulis* (prep. 3007).

OPHEIM (1959: 35) these two species are extremely closely allied—if not conspecific.

The Greenland specimen recorded by HENRIKSEN (1939: 31) under the name of *Polia nana* HUFN. proved by examination of the genitalia (prep. 2586) to be an extraordinarily small female of *Apamea exulis*.

Occurrence in Greenland:

West Greenland: between 59°55′ (Ilua) and 72°45′ (Upernavik). East Greenland: at 60°15′ (Lindenows Fjord) and 60°50′ (Danells Fjord) adjoining the distribution in the southern part of West Greenland, and between 65°35′ (Angmagssalik) and 74°40′ (Sabine Ø). Not found in North Greenland.

See map on p. 56 (fig. 21).

June–August.

13. ***Hadena (Anarta) richardsoni*** CURT.

Plate II: fig. 15.

Genitalia: ♂ AURIVILLIUS 1890 Pl. 3 fig. 4, KNABEN 1937 p. 23 fig. 7, ♀ DE LESSE 1951 p. 64 fig. 23.

A circumpolar species ranging from Alaska through the entire arctic America, Labrador, Ellesmere Island, Greenland, mountains of Fennoscandia, Novaya Zemlya, eastwards to East Siberia.

Occurrence in Greenland:

West Greenland: between 59°55′ (Ilua) and 72°45′ (Upernavik). East Greenland: at 61°45′ (Karritakornat), at 66°05′ (Sermilik), and between 69°10′ (Barclay Bugt) and 76°49′ (Stormkap). In North Greenland: at 76°33′ (Dundas), 77°35′ (Qânâq), 79° (Inglefield Land), 81°30′ (Polaris Bugt), 81°50′ (Kap Schmelck), 82°10′ (Jørgen Brønlund Fjord), 82°15′ (Midsommer Sø), 82°25′ (Erlandsen Land), and 82°34′ (Børglum Elv).

See map on p. 56 (fig. 22).

June–August.

14. ***Lasiestra (Anarta) leucocycla*** STAUD.

Plate IV: fig. 1.

Genitalia: ♂ Plate XI fig. 1, AURIVILLIUS 1890 Pl. 3, DE LESSE 1951 p. 66 fig. 25, ♀ DE LESSE 1951 p. 64 fig. 24, p. 68 fig. 28.

A nearctic species ranging from British Columbia through the Northwest Territories, Victoria Island, the Hudson Bay region, Newfoundland, Labrador, Baffin Island, Ellesmere Island, to Greenland, from where it was described (STAUDINGER 1857: 296–297).

L. staudingeri AURIV.—occurring in mountain parts of Fennoscandia—is often (thus e. g. by OPHEIM 1962: 10) considered conspecific with *leucocycla* STAUD., but judging from the material available (5 *staudingeri* from North Sweden, 20 *leucocycla* from Greenland, and 1 from Canada (Churchill)) these two species look so different that they cannot be synonymized. In *leucocycla* the forewings are brownish, the postmedian transverse line regularly curving and sharply serrated, while in *staudingeri* the forewings are grey, and the postmedian line incurving below the reniform stigma. The circular orbicular stigma—after which *leucocycla* is named—is very conspicuous in that species. Especially characteristic is the yellowish colour of the hind wings in *leucocycla* as compared with the grey, sometimes even whitish, ground-colour of the hind wings in *staudingeri*. As appears from Pl. XI figs. 1–2, the male genitalia of *staudingeri* are as a whole far more heavily sclerotized than those of *leucocycla*, and the clasper of the valva is blunt, slightly curving in *staudingeri*, regularly pointed in *leucocycla*.

Occurrence in Greenland:

Exclusively found in West Greenland: between 65°25′ (Sukkertoppen) and 72°45′ (Upernavik).

See map on p. 57 (fig. 23).

July.

15. ***Sympistis (Anarta) lapponica*** THNBG.

Plate IV: fig. 2.

Genitalia: ♂ Plate XI fig. 4, DE LESSE 1951 p. 66 fig. 26, ♀ DE LESSE 1951 p. 64 fig. 22.

An "amphiatlantic" species extending from the Northwest Territories, Labrador, Baffin Island, Greenland to the northern part of Fennoscandia and Novaya Zemlya.

Occurrence in Greenland:

West Greenland: between 60°43′ (Julianehåb) and 70°16′ (Pautût). East Greenland: between 69°24′ (Kap Dalton) and 70°40′ (Jameson Land, Liverpool Land). Not found in North Greenland.

See map on p. 57 (fig. 24).

July.

16. ***Sympistis (Anarta) zetterstedtii*** STAUD.

Plate IV: fig. 3.

Genitalia: ♂ Plate XI fig. 3, AURIVILLIUS 1890 Pl. 3, fig. 2, KNABEN 1937 p. 24 fig. 8, DE LESSE 1951 p. 68 fig. 27, ♀ DE LESSE 1951 p. 63 fig. 21.

Although sometimes very much like the Scandinavian form of *zetterstedtii* STAUD., the Greenland specimens are generally larger and

more greyish-coloured. AURIVILLIUS (1890: 20–22) considered this form a distinct species, *kolthoffi* AURIV., but the genitalia are identical with those of *zetterstedtii* from e. g. the Scandinavian peninsula. Specimens from Northeast Greenland may resemble *lapponica* THNBG. to such a degree that they are easily mistaken for *lapponica* (*vide* HENRIKSEN 1939: 33), if not identified by examination of the genitalia.

Holarctic, distributed within the arctic zone of North America, the Northwest Territories, British Columbia, Labrador, Baffin Island, Greenland, the mountains of Fennoscandia, and Siberia.

Occurrence in Greenland:

West Greenland: between 61°20′ (Grønnedal) and 72°45′ (Upernavik). East Greenland: between 68°30′ (Ravns Fjord) and 76°46′ (Rypefjeld, Danmarks Havn). North Greenland: at 76°33′ (Dundas), 77°50′ (Qânâq), 82°05′ (Ītukussuk Dal), 82°10′ (Jørgen Brønlund Fjord), 82°15′ (Midsommer Elv) and 82°25′ (Erlandsen Land).

See map on p. 57 (fig. 25).

July.

17. ***Syngrapha (Plusia) parilis*** HB.

Plate IV: fig. 4.
Genitalia: ♂ KNABEN 1937 p. 21 fig. 6, ♀ DE LESSE 1951 p. 69 fig. 30.

An "amphiatlantic" species ranging from arctic North America, the Northwest Territories, Alberta, Labrador, Baffin Island, Ellesmere Island, and Greenland to Northern Fennoscandia.

Occurrence in Greenland:

West Greenland: between 69°13′ (Jakobshavn) and 72°45′ (Upernavik). East Greenland: between 70°40′ (Jameson Land), and 74°25′ (Daneborg, Clavering Ø). In North Greenland found at 76°33′ (Dundas).

See map on p. 57 (fig. 26).

July.

18. ***Syngrapha (Plusia) borea*** AURIV.

Plate IV: fig. 5, AURIVILLIUS 1890 Pl. 1 (as *diasema* var. *borea*, type).
Genitalia: ♂ Plate IX fig. 1, AURIVILLIUS 1890 Pl. 3 fig. 5 (as *diasema* var. *borea*), DE LESSE 1951 p. 70 fig. 31 (as *diasema*), ♀ Plate VIII fig. 4, DE LESSE 1951 p. 71 fig. 34 (as *diasema*).

This species has previously been recorded in the lists of Greenland Lepidoptera under the name of *Syngrapha* (*Plusia*) *diasema* BDV. (var. *borea* AURIV.).

Concerning the differences between typical *diasema* BDV. and the Greenland specimens AURIVILLIUS (1890: 17–18), in his description of

the latter as belonging to a local form, var. *borea*, states (translated from Swedish): "the difference is rather significant and in reality so wide that the Greenland form nearly resembles *Pl. microgamma* more than the typical *Pl. diasema*. The hind wings are thus precisely like those of *Pl. microgamma* and very different from the hind wings of *diasema*."

In addition to the exterior differences just mentioned, the genitalia of "var. *borea*" (Pl. IX fig. 1, Pl. VIII fig. 4) differ considerably from those of *diasema* (Pl. IX fig. 3, Pl. VIII fig. 5, KOSTROWICKI 1961 p. 436 fig. 96, fig. 148) as well as from those of *microgamma* (Pl. IX fig. 2).

The specific distinction between *diasema* and *borea* was established by MCDUNNOUGH (1944: 187) who, referring 6 specimens from the Yukon Territory to *borea*, stated: "These all match AURIVILLIUS's description and figure of *borea* excellently and I believe I am correct in placing them under this name. The genitalia in both sexes show, however, that *borea* is a good species, quite distinct from *diasema* . . ."

MCDUNNOUGH does not illustrate the female genitalia of *borea*, and of the male unfortunately only the valva, but his figure (*loc. cit.* 227 fig. 4) of the genitalia of a female *diasema* from Labrador proves these to be identical with those of European specimens.

The North American population of *Syngrapha microgamma* HB. (West Canada and Nova Scotia), being larger and more brightly coloured than European specimens, are referred to a local race *nearctica* FERGUSON (1955: 23–27), but the genitalia are identical.

In Greenland neither *diasema* nor *microgamma* has been found.

S. borea is a nearctic species, at present recorded only from Alaska and Greenland, but most likely occurring also in northern parts of Canada.

Occurrence in Greenland:

Exclusively found in West Greenland: between 60°43′ (Julianehåb) and 69°45′ (Eqe).

See map on p. 58 (fig. 27).

July.

19. ***Syngrapha (Plusia) u aureum*** GUEN.

Plate IV: figs. 7–8–9.

Genitalia: ♂ Plate X fig. 5, AURIVILLIUS 1890 Pl. 3 fig. 6, DE LESSE 1951 p. 70 fig. 32 (as *interrogationis*), ♀ Plate X fig. 6, DE LESSE 1951 p. 71 fig. 33 (as *interrogationis*).

The Greenland specimens of the above-mentioned species have previously been recorded, sometimes as *u aureum* GUEN., sometimes as *interrogationis* L.

AURIVILLIUS (1890: 17), recording the Greenland species under the name of *Plusia u aureum* GUEN. and adding that the specimens examined

were very similar to each other, stated (translated from Swedish): "apparently distinctly separated from *P. interrogationis* L. by its smaller size, the pure white, blackish barred ciliae of the forewings, their more sharply marked, serrated cross lines, shorter protrusion at tornus, and a somewhat different colour pattern." This description corresponds in all details to the excellent illustration of *P. vaccinii* EDW. (a synonym of *u aureum* GUEN.) published later by HOLLAND (1905 Pl. XXVIII fig. 34).

In his paper on the Greenland Lepidoptera STAUDINGER (1857: 306) treated the Greenland species as *Plusia interrogationis*? L. var. *grönlandica* n. var., although inclined to consider it a distinct species. Having mentioned that his 13 Greenland specimens resemble each other and are very different from *interrogationis* from other regions, he states: "Auf den Vorderflügeln, wo eben der Hauptunterschied liegt, sind die Querlinien viel gezackter, namentlich die 3. und zwar gleichmässig bis zum Innenrande hin . . . Endlich sind die Franzen fast rein weiss und grau gescheckt. Was es mir ferner sehr wahrscheinlich macht, dass diese grönländische Interrogationis eigene Art sei, ist die unter dem einen Stück steckende Puppenhülse. Das betreffende Exemplar ist anscheinend sicher gezogen, und ist gar kein Grund vorhanden, anzunehmen, der Sammler habe eine falsche Puppenhülse darunter gesteckt. Diese leere Puppenhülse zeigt nun wesentliche Unterschiede von isländischen Puppen der Interrogationis . . . Wäre das Zugehören dieser unter dem Exemplar steckenden Puppe nebst Raupenbalg zweifellos, so würde ich ohne allen Anstand diese Art als verschieden von Interrogationis aufstellen."

In recent papers (HENRIKSEN 1939: 34, DE LESSE 1951: 70–71) the Greenland species is again recorded as *interrogationis* L.

Examination of the present material has convinced me that the Greenland species belongs to *u aureum* and not to *interrogationis*.

Pl. X figs. 5–6 illustrate the genitalia of Greenland specimens – having been checked against North American *u aureum* – and for comparison Pl. X figs. 2–3 show the genitalia of *interrogationis* from Denmark and Iceland, respectively. Although the genitalia of *interrogationis* are variable, the cornutus in the male and the shape of the ductus bursae (antrum) in the female exhibit taxonomic differences. It may be added that the figures of the female genitalia of what is stated as *u aureum* and *interrogationis*, respectively, by McDUNNOUGH (1944: 227, Pl. IV figs. 8–9) do not seem convincing.

The illustrations of the genitalia in both sexes of the Greenland species, shown by DE LESSE (1951 p. 70 fig. 32, p. 71 fig. 33) clearly match those of *u aureum* instead of *interrogationis*.

S. u aureum is a nearctic species ranging from Alaska, the northern Atlantic States, south to the Northeast U.S.A., New Hampshire, to Greenland.

Occurrence in Greenland:

West Greenland: between 60°43′ (Julianehåb) and 70° (Sarqaq). East Greenland: between 65°35′ (Angmagssalik) and 72°10′ (Mesters Vig). Not found in North Greenland.

See map on p. 58 (fig. 28).

July–August.

20. ***Autographa (Plusia) gamma*** L.

Plate IV: fig. 6.

A common migrant distributed in the palaearctic region as well as in North America.

Occurrence in Greenland:

Found in West Greenland between 60°43′ (Julianehåb) and 65°25′ (Sukkertoppen) and in East Greenland between 65°35′ (Angmagssalik) and 68°30′ (Ravns Fjord). Not noticed in North Greenland.

See map on p. 58 (fig. 29).

July–August.

Lymantriidae

21. ***Gynaephora (Dasychira, Byrdia) groenlandica*** WOCKE.

Plate I: figs. 14–15.
Genitalia: ♂ Plate IX fig. 4, DE LESSE 1951 p. 73 fig. 35, ♀ DE LESSE 1951 p. 73 fig. 36.

Exclusively recorded from Greenland (from where this species was described in 1874), Ellesmere Island, and Arctic Canada.

Allied to *Gynaephora rossii* CURT. occurring in Siberia, but the genitalia differ (according to KOZHANTSCHIKOV 1950 p. 239 fig. 97, and DE LESSE 1951: 72).

Occurrence in Greenland:

West Greenland: between 61°13′ (Ivigtut) and 73°20′ (Tasiussaq). East Greenland: between 70°15′ (Gåseland) and 77° (Germania Land). North Greenland: between 76°33′ (Dundas) and 79° (Inglefield Land) and at 81°30′ (Polaris Bugt), 83° ("Ula-Ulilla-kysten"), 83°18′ (Kap Neumayer), 82°10′ (Jørgen Brønlund Fjord), 81°50′ (Kap Schmelck) and 82° (Heilprin Land).

See map on p. 58 (fig. 30).

June.

Although the larvae occur numerously and the cocoons are frequently met with and easy to rear, the adults are very rarely seen. Feeds preferably on *Salix*.

Geometridae

22. *Operophtera (Cheimatobia) bruceata* Hulst.

Plate IV: figs. 10–11–12.
Genitalia: ♂ Plate XII fig. 1, Text fig. 2 A–C, de Lesse 1951 p. 58 fig. 10 (as *groenlandica*), ♀ Plate XII fig. 2, de Lesse 1951 p. 58 fig. 12 (as *groenlandica*).

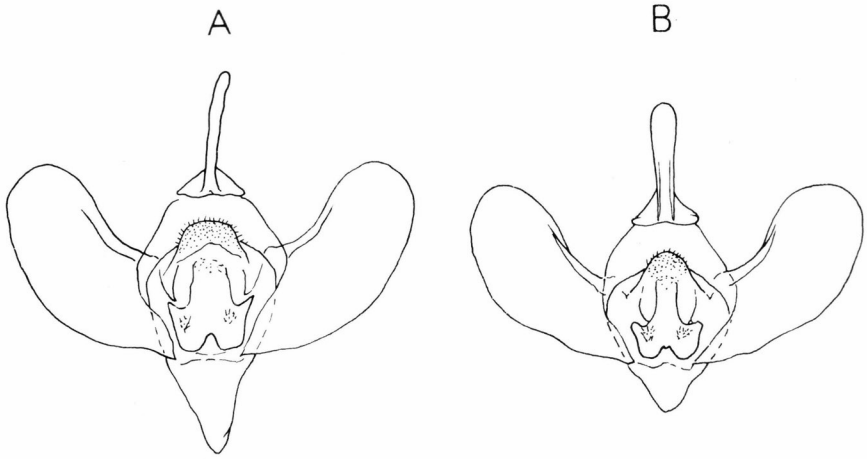


Fig. 1. Male genitalia (× 20) of A: *Operophtera bruceata* Hulst, B: *Operophtera brumata* L.
A: Milwaukee, Wisconsin, U.S.A., B: Halifax, Nova Scotia, Canada.
A, B: Douglas C. Ferguson prep. et del.

The Greenland Winter Moth, previously recorded (e.g. by Henriksen 1939:34) as *Cheimatobia brumata* L., is by de Lesse (1951:57–61) described as a distinct species, *Operophtera groenlandica* de Lesse, separated from *O. brumata* L., in the male sex among other characters by the long slender uncus and the different shape of the juxta, and in the female sex by its almost entire absence of wings.

Mr. D. C. Ferguson has been kind enough to dissect the male genitalia of the indigenous North American *Operophtera* (*Rachelia*) *bruceata* Hulst as well as the Nova Scotian *Operophtera brumata* L. and has generously placed at my disposition a sketch of the mounts enabling me to make a comparison with the genitalia of the Greenland species.

The present Nova Scotian population resulted from an introduction from Europe and the larvae soon became a serious pest now being controlled by forestry biologists.

As appears from text fig. 1 the sketch shows, partly that the male genitalia of the Nova Scotian population are identical with those of *O. brumata* from northern Europe (e.g. Iceland and Denmark), partly that the genitalia of the Greenland Winter Moth exactly match those of the North American *O. bruceata*. The name *groenlandica* DE LESSE (1951) thus becomes a synonym of *bruceata* HULST (1886).

Text fig. 2 shows the uncus of three Greenland males (A–C) as compared with that of a Danish (D) and two Icelandic (E–F) specimens.

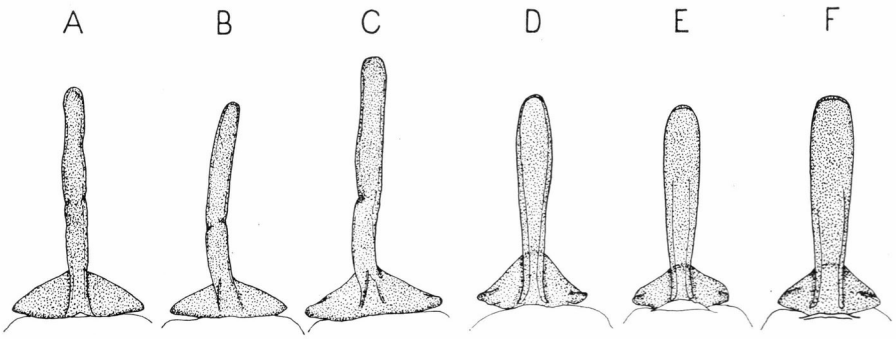


Fig. 2. Uncus (× 35) of A–C: *Operophtera bruceata* HULST, D–F: *Operophtera brumata* L.

A: West Greenland, Grønnedal 8.X.1955 (prep. 2572), B–C: West Greenland, Narssarssuaq, found dead indoors ult. VIII.1962 (preps. 2887, 2888), D: Denmark, Skodsborg 2.XI.1931 (prep. 1920), E–F: Iceland, Reykjavík, larva 10–11.VI.1951 (preps. 2897, 2898).

A: T. FEDDERSEN leg., B, C, D, E, F: NIELS L. WOLFF leg.

Pl. XII illustrates the genitalia of a Greenland pair (figs. 1–2) of *O. bruceata* and, for comparison, a male and a female of *O. brumata* from Denmark (figs. 3–4).

O. bruceata is a nearctic species having a transcontinental distribution through the northern United States and Canada, westwards occurring from the Rocky Mountains, and in Alberta almost reaching the boundary of the Northwest Territories, on the Atlantic coast extending down to New Jersey, eastwards reaching Newfoundland, and now established from Greenland.

Occurrence in Greenland:

Exclusively found in West Greenland: between 60° (Narssaq) and 61°20′ (Grønnedal), and at 69°45′ (Eqe).

See map on p. 59 (fig. 31).

September–October.

The Winter Moth was recorded from Greenland for the first time for more than 100 years ago (STAUDINGER 1857: 308). The oldest spec-

imen preserved in the collection of the Zoological Museum of Copenhagen is labelled Julianehåb 1902 (MELDORF leg.). In some of its Greenland localities the species occurs in great numbers.

Reared from *Salix glauca*.

23. ***Psychophora (Cidaria) sabinii*** KIRBY.

Plate IV: figs. 16–17.
Genitalia: ♂ Plate XII fig. 5, KNABEN 1937 p. 27 fig. 10.

This species is often, but incorrectly, recorded under the name of *frigidaria* GN. (1857), which is a junior synonym of *sabinii* KIRBY (1820).

Holarctic, occurring from Alaska through arctic North America, Ellesmere Island, Greenland, the northernmost parts of Fennoscandia, Novaya Zemlya, Siberia, and Northeast Asia to Kamchatka.

Occurrence in Greenland:

Except for an old record (M'LACHLAN 1878 (1879): 114–115) from 72°45′ (Upernavik) not reported from West Greenland. In East Greenland: between 70°30′ (Rødeø) and 76°49′ (Stormkap). In North Greenland: at 78°56′ (Marshall Bugt), 81°30′ (Polaris Bugt), 82° (Wulff Land), 82° (Heilprin Land), 82°10′ (Jørgen Brønlund Fjord), and 82°15′ (Midsommer Sø).

See map on p. 59 (fig. 32).

July–August.

24. ***Entephria (Cidaria) polata*** DUP.

Plate IV: figs. 13–14–15.
Genitalia: ♂ Plate XII fig. 6, KNABEN 1937 p. 26 fig. 9, ♀ DE LESSE 1951 p. 57 fig. 8.

A holarctic species of a wide range in arctic and boreal North America (Alaska to Labrador, Baffin Island, Ellesmere Island), arctic Europe and Asia (Siberia to Kamchatka).

A large number of subspecific names have been applied to this species (vide e. g. MUNROE 1951: 290–294). The Greenland specimens are generally referred partly to f. *brullei* LEF., partly to f. *punctipes* CURT., but the wide individual variation which exists between specimens from the same locality renders a satisfactory subdivision into local races in Greenland most difficult. The male genitalia—shown in Plate XII fig. 6—of Greenland specimens exactly match the figure of those of *E. byssata* AURIV. pictured by NORDSTRÖM & WAHLGREN (1941 p. 263 fig. 246, but although Scandinavian *byssata* and *polata* look different from each other I see no genitalic difference between them.

Occurrence in Greenland:

West Greenland: between 60°43′ (Julianehåb) and 73°20′ (Tasiussaq). East Greenland: between 63°35′ (Bernstorffs Isfjord) and 76°46′ (Dan-

marks Havn, Hvalrosodden). In North Greenland: at 76°33′ (Dundas), 77°35′ (Qânâq), 77°49′ (Siorapaluk), 77°50′ (Neqe), 82° (Heilprin Land), 82°10′ (Jørgen Brønlund Fjord), 82°15′ (Midsommer Elv), 82°25′ (Erlandsen Land), and 82°34′ (Børglum Elv).

See map on p. 59 (fig. 33).

July–August.

25. ***Eupithecia gelidata*** MÖSCHL.

Plate V: figs. 1–2–3.

Genitalia: ♂ Plate XIII fig. 1, Text fig. 3, DE LESSE 1951 p. 54 fig. 4, ♀ Plate XIII fig. 2, DE LESSE 1951 p. 57 fig. 8.

Although recorded correctly as *E. gelidata* MÖSCHL. by e. g. BANG-HAAS (1896: 188–189) and HENRIKSEN & LUNDBECK (1917: 691–692), the Greenland material is by HENRIKSEN (1939:35) treated as a variety of *E. nanata* HB.

E. gelidata MÖSCHL.—described on the basis of a specimen from Labrador but by its author also known from Greenland—is a *Salix* and *Betula* feeding species specifically separated, and differing in the genitalia, from the *Calluna* feeding palaearctic species *E. nanata*.

The sacculus (at the ventral edge of the valva in the male genitalia) is, although variable, in *gelidata* generally terminating in a distinct projecting tooth, in *nanata* tending to form a blunt projection. In the *nanata*-group the aedeagus (vesica) contains (1) a plate, large and curved, cephalad terminating in two projections, weakly sclerotized except on the lateral edges, (2) two stout spines of unequal size, variable in shape, (3) a bunch of numerous minute spines arranged in a "fox-tail" formation, (4) a thin layer of small spines, separated from the "fox-tail", but often inconspicuous in the mounts and, especially, difficult to illustrate.

As appears from text fig. 3, showing the aedeagus of 4 *gelidata* from West Greenland and 4 from East Greenland, the two stout spines mentioned are far more heavily developed in *gelidata* than is the case in *nanata* (text fig. 4 E–H). The figure of the aedeagus of a North American *gelidata* shown by MCDUNNOUGH (1949: 719 fig. 11 A) matches those of the Greenland *gelidata* quite closely.

The *nanata*-group comprises a third species, viz. *hyperboreata* STAUD. occurring in (especially northern) Fennoscandia and northern Central Europe, the taxonomic status of which still seems somewhat uncertain. This species feeds on *Ledum* but is (in Norway) recorded also from districts where this plant does not occur. The wings are more indistinctly marked and more greyishly suffused than in *gelidata* as well as *nanata*.

E. hyperboreata is often—thus by MCDUNNOUGH (1949: 624)—considered conspecific with *gelidata*, and as appears from text fig. 4 A–D,

showing the aedeagus of a Norwegian as well as three Swedish *hyperboreata*, the male genitalia resemble those of *gelidata* as regards the development of the two stout spines.

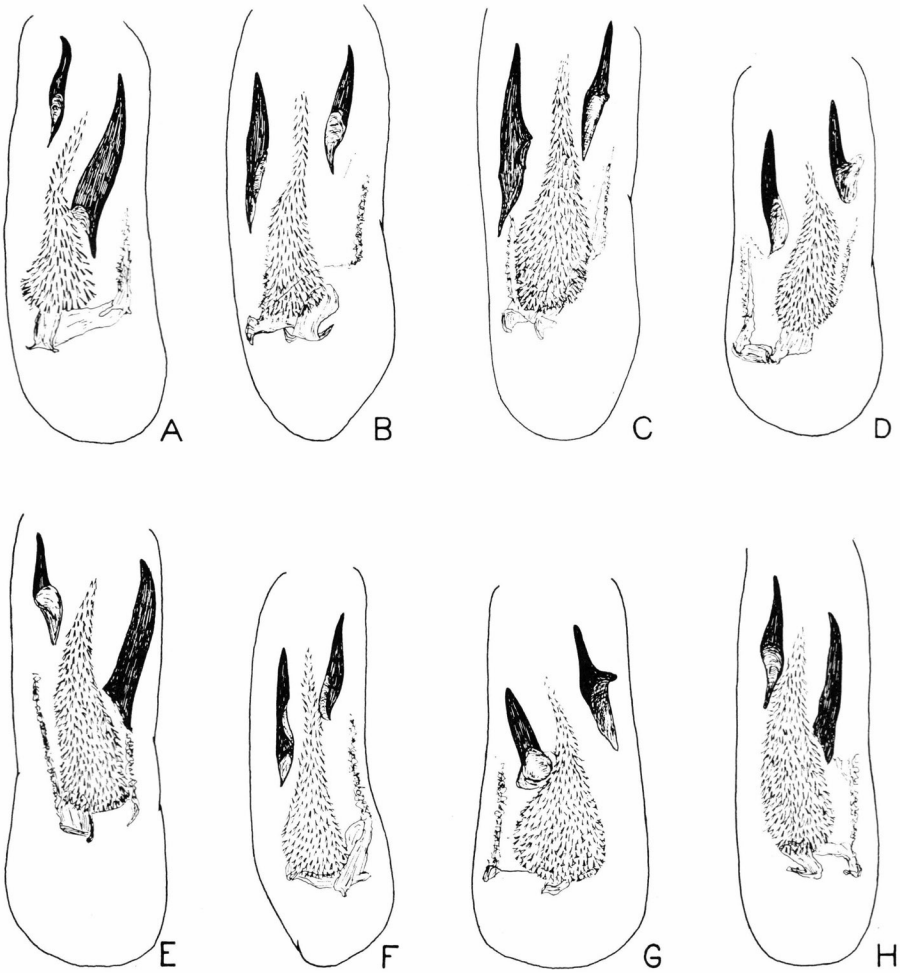


Fig. 3. Aedeagus (×45) of *Eupithecia gelidata* Möschl.

A: West Greenland, Julianehåb 14.VII.1948 (prep. 1408), B: West Greenland, Unartoq 5.VII.1948 (prep. 1397), C: West Greenland, Laksefjord 7.VII.1951 (prep. 2575), D: West Greenland, Søndre Strømfjord ex l. feeding on *Salix glauca* 11.VIII. 1962 (prep. 2889), E–H: East Greenland, Mesters Vig 19.VI.1955 (preps. 2868, 2869, 2870, 2871).

A, B, C: Chr. Vibe leg., D: Niels L. Wolff leg., E, F, G, H: Hálfdan Björnsson leg.

Until these species have been more thoroughly studied, preferably on the basis of bred specimens, it seems, however, safer to keep them separate.

McDUNNOUGH (1949: 626) states *E. gelidata* to have been reared from *Betula* but adds: "further life history data are very essential."

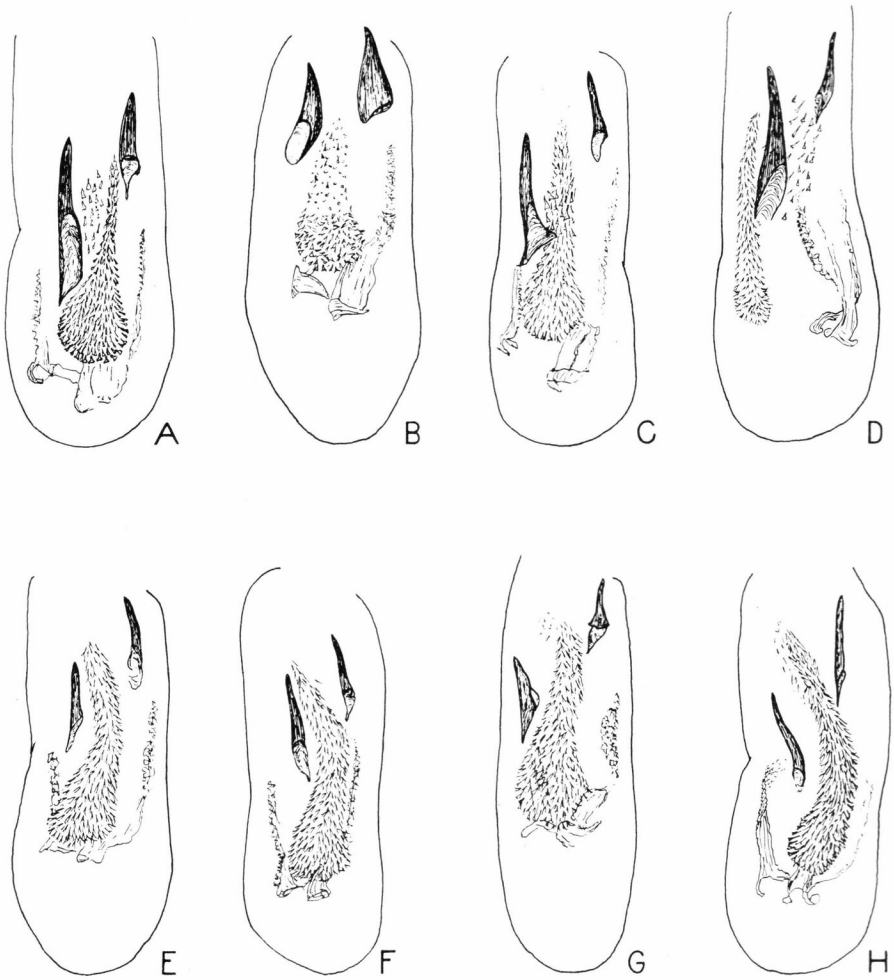


Fig. 4. Aedeagus (×45) of A–D: *Eupithecia hyperboreata* STAUD., E–H: *Eupithecia nanata* HB.

A: Norway, Kåfjord, Alt. 29.VI.1924 (prep. 2927), B: Sweden, Åsele Lappmark, Vilhelmina 12.VII.1951 (prep. 2259), C: Sweden, Umeå, S. Backsjö 26.VI.1951 (prep. 2873), D: Sweden, Vb. Bjuröklubb 3.VII.1946 (prep. Sv. 21), E–F: Iceland, Vifilsstaðir 20.VI.1951 (preps. 2892, 2894), G–H: Denmark, Frøslev 15–21.VII.1934 (preps. 2895, 2896).

A: E. BARCA leg., B, C, D: INGVAR SVENSSON leg., E, F, G, H: NIELS L. WOLFF leg. — [Figured for comparison].

In August 1962 I observed the larvae at Søndre Strømfjord (West Greenland) feeding numerously on *Salix glauca*, eating the parenchyma, sparsely on *Betula nana*. Specimens were bred from both plants mentioned.

E. gelidata has a wide range in arctic and boreal North America southwards extending down into Colorado, New Mexico, and probably even to the west coast of Vancouver Island, westwards reaching from Alaska to Nova Scotia, Labrador, and Greenland.

Occurrence in Greenland:

West Greenland: between 60°27′ (Ûnartoq) and 72°45′ (Upernavik). East Greenland: between 65°35′ (Angmagssalik) and 73°40′ (Hold with hope). Not found in North Greenland.

See map on p. 59 (fig. 34).

June–July.

26. ***Eupithecia sobrinata*** Hb.

Plate V: figs. 4–5.
Genitalia: ♂ Plate XIII fig. 5, ♀ Plate XIII fig. 6.

In all previous lists of Greenland Lepidoptera this species has been recorded under the name of (?) *altenaria* Staud.

Examination of the genitalia of Greenland specimens of both sexes has not disclosed any difference at all from those of specimens of *E. sobrinata* Hb. from Iceland or Denmark.

Like the Iceland specimens the Greenland ones are darker than the typical form, which has a brownish, not blackish, ground colour. They must be referred to f. *scoriata* Staud., described from Iceland. According to McDunnough (1949: 640) the form occurring in North America also approaches quite closely to this race.

A circumpolar species widely distributed over the United States and Canada as well as in the palaearctic region, westwards to Kamchatka.

Occurrence in Greenland:

Exclusively found in West Greenland: between 60° (Frederiksdal) and 64°28′ (Kapisigdlit).

See map on p. 60 (fig. 35).

July–August.

This species is confined to *Juniperus* and in 1962 swarmed abundantly at Narssarssuaq wherever this plant occurred.

Pyralidae

27. ***Tehama (Crambus) bonifatella*** Hulst.

Plate V: fig. 6.
Genitalia: ♂ Plate XIV fig. 1, Wolff 1950 p. 423 fig. 3, ♀ Wolff 1950 p. 423 fig. 4 (as *Crambus bonifatellus* Hulst).

From a zoogeographical point of view a highly interesting species. When Chr. Vibe for the first time collected specimens of a Greenland

Crambus and the occurrence in Greenland of *bonifatella* was established (WOLFF 1950: 421–424), this species had not been known to occur nearer to Greenland than in Colorado (U.S.A.), a distance of some 2,500 miles.

In recent years the knowledge of its distribution in North America has been greatly increased. As appears from the map on p. 64 (fig. 53), plotted according to kind information from Professor A. B. KLOTS, *bonifatella* is at present known from a considerable number of localities in western North America, ranging from Alaska to New Mexico, as well as from some places on the east coast (Nova Scotia, Labrador, and Newfoundland).

Once a normal arctic-alpine species, it has in the southern regions pushed lower down on the mountains, occurring in the lower forest-meadows. In its Greenland localities it is swarming abundantly in the grassy areas.

Occurrence in Greenland:

Exclusively found in West Greenland: between 60°43′ (Julianehåb) and 64°30′ (Qôrnoq).

See map on p. 60 (fig. 36).

Medio July–medio August.

28. ***Plodia interpunctella*** HB.

A synanthropous species of American origin having been spread all over the world through commercial distribution of stored vegetable products, to which it has become a destructive pest.

Occurrence in Greenland:

A single specimen found in West Greenland at 70° (Qutdligssat) on 5th August 1957 (CHR. VIBE leg.).

29. ***Anagasta (Ephestia) kühniella*** ZELL.

An indoor species of cosmopolitan distribution infesting many sorts of dried vegetable products, especially grain flours.

Its home seems to have been the Mediterranean region.

Occurrence in Greenland:

Recorded in the Annual Report for 1953–1954 (1956: 6) from the Danish Government Pest Infestation Laboratory (Stored Products and Household Pests) from West Greenland at 60°43′ (Julianehåb).

30. ***Ephestia elutella*** HB.

The species recorded from Greenland by HENRIKSEN (1939: 36) under the name of *Ephestia kuehniella* L. belongs here (prep. 3001).

This cosmopolitan species, feeding on a number of dried vegetable products, has often become a pest in storage houses. In warmer climates it also breeds out-of-doors.

Occurrence in Greenland:

Observed in West Greenland at 60°43′ (Julianehåb) and 64°05′ (Ameralik).

August.

31. ***Pyla (Salebria) fusca*** HAW.

Plate IV: fig. 18.

Genitalia: ♂ BARCA 1937 Pl. II fig. 8, DE LESSE 1951 p. 53 fig. 2, ♀ DE LESSE 1951 p. 57 fig. 6.

A holarctic species ranging from Alaska through Canada, the Northern United States, Labrador, Greenland, Iceland, arctic and boreal Europe, Siberia, Central Europe and Asia Minor.

Occurrence in Greenland:

West Greenland: between 60°30′ (Lichtenau Fjord) and 72°45′ (Upernavik). East Greenland: at 63°15′ (Qierfik at Skjoldungen) and between 68°42′ (Søkongens Bugt) and 74°15′ (Clavering Ø, Wollaston Forland). Not found in North Greenland.

See map on p. 60 (fig. 37).

July–August.

32. ***Scoparona (Scoparia) centuriella*** DEN. & SCHIFF.

Plate IV: figs. 20–21.

Genitalia: ♂ DE LESSE 1951 p. 53 fig. 1, ♀ DE LESSE 1951 p. 57 fig. 5.

A holarctic species distributed in the United States, Canada, Labrador, Ellesmere Island, Greenland, the northern part of Fennoscandia, Siberia, and appearing again in the mountains of Central Europe, and the Caucasus.

Occurrence in Greenland:

West Greenland: between 60°30′ (Lichtenau Fjord) and 70°40′ (Nûgssuaq, Marrait). East Greenland: between 65°35′ (Angmagssalik) and 74°15′ (Clavering Ø). Not found in North Greenland.

See map on p. 60 (fig. 38).

July–August.

33. ***Nomophila noctuella*** DEN. & SCHIFF.

Plate IV: fig. 19.

On two occasions this species, known as a widespread immigrant, preferably in temperate climates, in the old as well as the new world, has been met with in Greenland (T. ANDERSEN leg.).

Occurrence in Greenland:

Exclusively observed in West Greenland: at 61°20′ (Tigssaluk) and at 61°13′ (Kûngnât).

See map on p. 61 (fig. 39).

8th July 1954 (3 specimens) and 3rd August 1954 (1 specimen).

34. *Udea (Pyrausta) torvalis* MÖSCHL.

Plate IV: fig. 22.
Genitalia: ♂ Plate XI fig. 5, DE LESSE 1951 p. 54 fig. 3, ♀ DE LESSE 1951 p. 57 fig. 9.

Known from arctic Canada, Labrador, and Greenland.

Occurrence in Greenland:

West Greenland: between 60°15′ (Augpilagtoq) and 72°45′ (Upernavik). East Greenland: between 69°10′ (Barclay Bugt) and 76°46′ (Rypefjeld, Danmarks Havn, Hvalrosodden). North Greenland: between 76°10′ (Ivssuvigsôq) and 79° (Inglefield Land), and at 82° (Heilprin Land), 82°10′ (Jørgen Brønlund Fjord), and 82°15′ (Midsommer Elv).

See map on p. 61 (fig. 40).

June–August.

35. *Stenoptilia islandica* STAUD.

Plate V: fig. 7.
Genitalia: ♂ Plate XIV figs. 2–3, Text fig. 5A, BARCA 1937 Pl. II fig. 5.

The taxonomic status of the species recorded by HENRIKSEN (1939: 38) under the above name has not yet been definitely settled.

In a paper on the insects of Iceland (LINDROTH 1931: 257) *Stenoptilia islandica* STAUD. is on the authority of BENANDER treated as conspecific with *S. pelidnodactyla* STEIN.

Having later on re-examined the male genitalia of various *Stenoptilia* species BENANDER (1937: 497–499) concludes that *islandica* differs from *pelidnodactyla* regarding the shape of the anellus and from the remaining species in the shape of the aedeagus.

In a paper on East Greenland Microlepidoptera BARCA (1937: 33–34) states as his opinion that *islandica* is a distinct species, separated from *pelidnodactyla*, although closely related to *pelidnodactyla* v. *borealis* WOCKE, which occurs in the mountains of Norway.

Having dissected 3 ♂♂, 3 ♀♀ of *islandica* from Iceland (*loc. typ.*), 4 ♂♂, 1 ♀ of the Greenland Plume Moth, and 1 ♂ of *pelidnodactyla* v. *borealis* from Dovre in Norway (*loc. typ.*) I have arrived at the conclusion that all represent but one species. Fig. 5 shows the anellus of a specimen from each area mentioned. As this species proves to differ from *pelidno-*

dactyla (4♂♂, 2♀♀ having been dissected) *islandica* must be considered a valid species, and *borealis* WOCKE (1864) becomes a synonym of *islandica* STAUD. (1857).

By courtesy of the Head of the Hope Department of the University of Oxford I have been able to examine the Greenland specimen, recorded as *Pterophorus monodactylus* L. by CARPENTER (1937: 406). This specimen, too, belongs to the same species as the other Greenland Plumes.

Although I have not seen the North Greenland Plume Moth described under the name of *mengeli* FERNALD (1898), I do not doubt that this species as well should be referred to *islandica*.

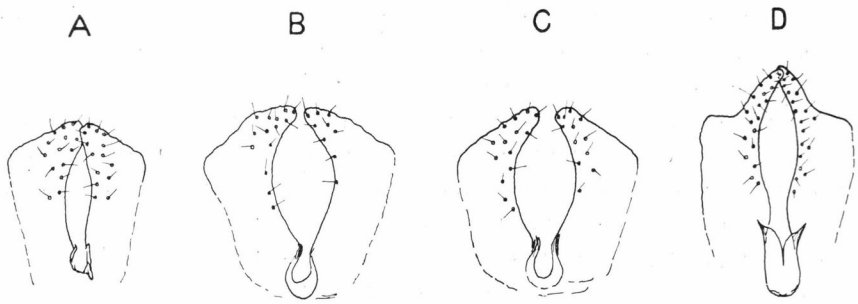


Fig. 5. Anellus (×90) of A–C: *Stenoptilia islandica* STAUD., D: *Stenoptilia pelidnodactyla* STEIN.

A: North Greenland, North Heilprin Land 8.VII.1949 (prep. 2404), B: Iceland, Skaftafell 24.VI.1951 (prep. 2793), C: Norway, Dovre (prep. 2799), D: Denmark, Faaborg 8.VI.1922 (prep. 2802).

A: P. JOHNSEN leg., B: NIELS L. WOLFF leg., C: coll. Zool. Mus. Copenh., D: C. S. LARSEN leg.

S. islandica (incl. *borealis*) is known from Greenland, Iceland, and mountains of Fennoscandia (see map on p. 64 fig. 54).

Occurrence in Greenland:

Not found in West Greenland. In East Greenland: between 70°15 (Gåseland) and 74°40′ (Sabine Ø). In North Greenland: at 78°18′ (Foulke Fjord), 78°20′ (Etah), and at 82° (North Heilprin Land).

See map on p. 61 (fig. 41).

July.

Tortricidae

36. ***Acleris boreana*** n. sp.

Plate V: figs. 8–9–10 (paratypes).

Genitalia: ♂ Plate XV fig. 1 (holotype), fig. 2 (paratype), DE LESSE & VIETTE 1949 p. 84 fig. 1 (as *Eucosma petalonota* MEYR., a misprint for *Peronea caryosphena* MEYR.), ♀ Plate XVI fig. 1 (allotype), fig. 2 (paratype), DE LESSE & VIETTE 1949 p. 88 fig. 10 (as *Peronea caryosphena* MEYR.).

Examination of the genitalia of the Greenland specimens preserved in the collection of the Zoological Museum of Copenhagen under the name of *Acalla maccana* TR. (HENRIKSEN 1939: 37) proved these to belong, not to *Acleris maccana* TR. (the genitalia of which are very characteristic), but to a species closely related to, although not conspecific with, *Acleris hastiana* L. The specimens recorded by DE LESSE & VIETTE (1949: 90–92) as *caryosphena* MEYR. also belong to the above-mentioned species several specimens of which have been collected in the autumn as well as, after hibernation, in the spring.

According to McDUNNOUGH (1934: 301) a great confusion exists within the difficult *hastiana* group in North America, and a number of closely allied species have been named. As none of those the genitalia of which are illustrated by McDUNNOUGH (1934), agree with the Greenland species, this is described below as a distinct species:

Acleris boreana n. sp. Size as *hastiana* L. and, like this species (which is one of the most variable known Lepidoptera), remarkably variable. Pl. V fig. 8 shows a greenish, brown speckled form, fig. 9 is almost unicolorously brown, while fig. 10 is a true parallel to the corresponding variant of *hastiana*, which has a narrow, sharply edged, white streak running through the blackish forewing from base to apex.

As the holotype has been designated a male specimen of the blackish form commonly met with, while the allotype (♀) is grey, having on the forewing at $^1/_3$ an oblique, light grey transverse band bordered with brownish lines.

The differences between the genitalia of *boreana* and *hastiana* shown in Pl. XV–XVI are especially noticeable in the females, which in *boreana* have the lateral lobes of the ostium plate much shorter and broader than in *hastiana*, the ostium openly V-shaped, and without strongly sclerotized lateral projections. The signum in *boreana* is oblong, normally somewhat larger than in *hastiana*. The males of *boreana* have the socii more rounded in outline than in *hastiana*, the socii of which are almost triangular. The aedeagus contains in *boreana* a strongly sclerotized plate and 3–4 stout spines, in *hastiana* a sharply edged, but otherwise weakly sclerotized plate and normally 4–5 (in exceptional cases 6 or even 3) somewhat finer spines.

The type material is preserved in the collection of the Zoological Museum of Copenhagen.

Occurrence in Greenland:

Exclusively found in West Greenland: between 59°55′ (Ilua) and 70°10′ (Kûgssuaq).

See map on p. 61 (fig. 42).

Appears in the autumn (August–September) and, after hibernation,

is again active in the spring (April–June). The "first brood" mentioned by DE LESSE & VIETTE (1949: 91–92) must refer to hibernated specimens.

Bred from *Salix glauca*.

37. ***Acleris (Peronea) caryosphena*** MEYR.

Plate V: figs. 11–12.
Genitalia: ♂ Plate XVII figs. 1–2, fig. 3 (aedeagus of holotype), fig. 4 (aedeagus), ♀ Plate XVIII figs. 1–2.

In 1949–1950 CHR. VIBE collected a considerable material of this species, described from Greenland in 1937, of which until then only the holotype (and a broken specimen) had been known. Later on this species has proved to be common in some districts of Southwest Greenland, and in 1962 the moths were swept in numbers among *Betula nana* in Søndre Strømfjord as well as at Narssarssuaq.

By courtesy of the Head of the Hope Department of the University of Oxford examination and illustration of the genitalia of the holotype has been made possible.

MEYRICK (1937: 157) states in his description of *Peronea caryosphena*: "Probably allied to *hastiana* and feeding on *Salix*." This remark leads to the opinion that MEYRICK's description refers to *Acleris boreana* n. sp., and it is no wonder that DE LESSE & VIETTE (1949: 90–92) refer their *hastiana*-looking specimens, bred from *Salix*, to *caryosphena* MEYR.

As appears from Pl. XVII–XVIII *caryosphena* is by no means allied to *hastiana*, but to *ferrugana* TR.

The female genitalia of *caryosphena* (Pl. XVIII figs. 1–2) differ from those of *ferrugana* (Pl. XVIII figs. 3–4) in having the lateral lobes of the ostium plate shorter and broader, the sclerotized portion of the ductus bursae longer, more evenly sclerotized, more distinctly separated from the membranous portion, and the signum smaller.

The male genitalia of *caryosphena* (Pl. XVII figs. 1–2–3) are very similar to those of *ferrugana* (Pl. XVIII figs. 4–5). The socii seem a little shorter and broader in *caryosphena* than in *ferrugana*, but it must be admitted that it is extremely difficult to obtain equivalent positions in the mounts. The cornuti consist, as in *ferrugana*, of a plate, and a short as well as a longer spine.

Although none of the illustrations of the North American *Acleris* species published by MCDUNNOUGH (1934: 325–332) fits in with *caryosphena*, his description (*loc. cit.*: 321–322) of North American *ferrugana* (which he does not picture) may point to *caryosphena* instead of *ferrugana*.

The predominant form is blackish brown without any wing pattern, but the species is, like *ferrugana*, most variable, and specimens occur which exactly match e.g. the forms of *ferrugana* shown by KENNEL (1921 Pl. V figs. 43 and 46).

Note: As the hitherto used names of some of the *Acleris* species have been interchanged by OBRAZTSOV (1956: 133) and HANNEMANN (1961: 56), it becomes necessary to point out that the name *ferrugana* TR. mentioned above is used as usual (vide WOLFF 1952: 56–61) and not applied to the same species as by the said authors.

At present known exclusively from Greenland.

Occurrence in Greenland:

Exclusively found in West Greenland: between 60°43′ (Julianehåb) and 67° (Søndre Strømfjord).

See map on p. 62 (fig. 43).

Appears in the autumn (August) and after hibernation again in the spring (May).

Reared from *Betula nana*. The larvae sometimes occur so numerously that wide areas grown with *Betula nana* exhibit the same red colour as in the autumn due to the attack of the larvae.

38. ***Argyroploce inquietana*** WLK.

Plate VI: figs. 1–2.

Genitalia: ♂ Plate XIX fig. 1, BARCA 1937 Pl. II fig. 7 (*boreana*), ♀ HEINRICH 1926 Pl. 41 fig. 252.

HENRIKSEN (1939: 37) includes this species in the Greenland list exclusively on the basis of CARPENTER (1937: 406), who states 15 specimens to have been collected in Northwest Greenland by the Oxford University Ellesmere Land Expedition 1934–1935.

Prior to that the occurrence in Greenland of *inquietana* had been established by HEINRICH (1926: 186) in his monograph of the North American *Laspeyresiinae* and *Olethreutinae*.

One of the specimens mentioned by CARPENTER (1937) has been presented to the Zoological Museum of Copenhagen and agrees in every detail with the large material of the species recorded by HENRIKSEN (1939: 37) as *A. boreana* RBL. The genitalia of the Greenland *boreana* also proved to correspond with the *inquietana* genitalia pictured by HEINRICH (1926 Pl. 75 fig. 442), who also treats *inquietana* and *boreana* as conspecific.

As the name *boreana* RBL. (a substitution for *septentrionana* MÖSCHL. 1883, being preoccupied by *Argyroploce* (*Orthotænia*) *septentrionana* CURT. 1835) dates from 1901 while *inquietana* WLK. dates from 1863, the latter name must be given priority.

REBEL (1911: (43)–(44)) records 2 ♂♂ specimens of a species from East Greenland which he describes under the name of *Cnephasia hoyosi* n. sp. An effort to trace these specimens in Vienna has failed, but the photograph which accompanies the description demonstrates that *hoyosi* RBL. must belong to *Argyroploce inquietana* WLK.

Concerning the photograph of a Norwegian specimen of *Argyroploce* (*Phiaris*) *boreana* RBL. published by BARCA (1937 Pl. III fig. 9) Dr. N. KNABEN has kindly informed me (*in litt.*) that a typographical error has occurred, the Norwegian specimen in question belonging not to *inquietana* (*boreana*) but to *schultziana* F.

Dr. W. HACKMAN has kindly permitted the dissection of the genitalia of a *Argyroploce* sp. from Kamchatka (Ozernaja 29.VII.1917, V. WUORENTAUS leg.) preserved in the Zoological Museum of Helsingfors under the name of *A. hepialana* KENN. The genitalia of the said specimen proved to exhibit no perceptible difference from those of *inquietana* WLK.

A. inquietana is an arctic species hitherto known from Kamchatka, "Arctic America" (type), the Northwest Territories, Labrador, Ellesmere Island, and Greenland.

Occurrence in Greenland:

Not found in West Greenland. East Greenland: between 69°24′ (Kap Dalton) and 76°46′ (Rypefjeld, Danmarks Havn). In North Greenland found between 76°33′ (Dundas) and 79° (Inglefield Land).

See map on p. 62 (fig. 44).

June–August.

Olethreutidae

39. ***Olethreutes (Argyroploce) mengelana*** FERN.

Plate VI: figs. 3–4.
Genitalia: ♂ Plate XIX fig. 2, HEINRICH 1926 Pl. 76 fig. 446, BARCA 1937 Pl. II fig. 4 (*groenlandicana*), ♀ HEINRICH 1926 Pl. 41 fig. 251.

HENRIKSEN (1939: 37) treats *Argyroploce groenlandicana* B.–H. and *A. mengelana* FERN., both described from Greenland, as distinct species, overlooking the fact that HEINRICH (1926: 187) after examining type material of both, had demonstrated the former (described by BANG-HAAS 1896: 190–191) to be a junior synonym of the latter (1894).

This species looks somewhat like *O. aquilonana* KARV. occurring in arctic Sweden and Finland, but the genitalia differ.

O. mengelana is an arctic species recorded from arctic Canada (incl. Georgina Island south of Melville Peninsula), Ellesmere Island, and Greenland.

Occurrence in Greenland:

Not found in West Greenland. East Greenland: between 70°27′ (Hekla Havn) and 76°46′ (Rypefjeld, Danmarks Havn). North Greenland: between 77°41′ (Mac Cormick Fjord) and 79° (Inglefield Land), and at 82°28′ (Sommerdalen in Wulff Land), 82°34′ (Børglum Elv), 82°25′ (Erlandsen Land), 82° (Heilprin Land), and 82°15′ (Midsommer Elv).

See map on p. 62 (fig. 45).

June–July.

40. ***Epinotia (Eucosma) indecorana*** ZETT.

Plate VI: fig. 5–6.

Genitalia: ♂ Plate XIX fig. 6, DE LESSE & VIETTE 1949 p. 91 fig. 14 (as *Peronea caryosphena* MEYR., a misprint for *Eucosma petalonota* MEYR.), BENANDER 1940 p. 65 fig. 4 (lectotype of *indecorana*), ♀ DE LESSE & VIETTE 1949 p. 88 fig. 12.

Although the identity of this species, described on the basis of one specimen from Greenland and another from Norway (Dovre) in the Insecta Lapponica by ZETTERSTEDT (1840: 989) under the name of *Teras indecorana*, has not yet been satisfactorily cleared up, the name cannot be included in the group of "forgotten names".

In previous lists of Greenland Lepidoptera (e.g. AURIVILLIUS 1890: 26, HENRIKSEN & LUNDBECK 1917: 694–695) *Teras indecorana* ZETT. is regarded a synonym of *Acleris* (*Acalla*) *emargana* f. *effractana* FROEL., and as this species has not later been refound in Greenland, it is not accepted as a Greenland species by HENRIKSEN (1939: 38).

In his revision of the Microlepidoptera, mentioned in the Insecta Lapponica, BENANDER (1940 p. 56, 65 fig. 4) pictures the genitalia of the Greenland specimen of *Teras indecorana* preserved in ZETTERSTEDT's collection in the Museum of Lund. The Norwegian specimen had been removed from the collection, and efforts now made to trace it elsewhere have failed.

The said illustration of the genitalia of *indecorana* ZETT. clearly indicates that this species belongs, not to the genus *Acleris* (*Teras*), but to *Epinotia* (*Epiblema*) and the specimen is by BENANDER identified as *Epiblema* ? *solandriana* L.

The only *Epiblema* recorded from Greenland was described by MEYRICK (1937: 157) under the name of *Eucosma petalonota* n. sp. Through the courtesy of Dr. C. H. LINDROTH (Zool. Inst. University of Lund) and Mr. E. TAYLOR (Hope Department, University of Oxford), respectively, I have had an opportunity to re-examine the said specimen of *indecorana* ZETT. as well as the lectotype of *petalonota* MEYR.

Superficially these two types look different. That of *petalonota* proved to be similar to the Greenland *Epinotia* specimens, now having

been collected in numbers, which are greyish brown, blackishly suffused, and exhibiting at least the outline of a large basal patch, while that of *indecorana* was unicolorously light brown without any visible basal patch. Examination of the wings of *indecorana* under the microscope proved these to be much rubbed, but still a few dark scales near the apex of the wing were present. The light brown colour is probably due simply to fading because a couple of Greenland *Epinotia* specimens which for a prolonged period had been exposed to the light exhibit almost the same tint. The genitalia of the two types were identical.

In this genus the number and the shape of the cornuti in the male genitalia are of taxonomic importance, but as they are deciduous, being shed during copulation, they are often missing, which is also the case in the *indecorana* type. After shedding, a trace of each cornutus is, however, visible on the surface of the vesica, and these marks are very conspicuous in the *indecorana* type, proving that 15 cornuti had been present before copulation. In the *petalonota* type the cornuti were not shed, and their number seems to be 14 or 15. In 8 slides of Greenland *Epinotia* the number of cornuti varies between 13 and 17 (average about 15). On the other hand *E. solandriana* L. has twice as many cornuti (30–38).

Although this *indecorana* syntype superficially looks atypical as compared with normal Greenland *Epinotia*, they are without any doubt conspecific, and the name *petalonota* Meyr. (1937) becomes a synonym of *indecorana* Zetterstedt (1840). I have designated the said specimen (by Zetterstedt supplied with a label reading: "*T. indecorana* Zett. ♀ Grönland. Westerm.") as the lectotype—in spite of its turning out to be a ♂ instead of a ♀.

The statement in Zetterstedt's description according to which the other *indecorana* syntype originated from Norway (Dovre) is correct, for my comparison between Greenland specimens of *indecorana* and specimens of *E. biscutana* Wck.—a *Betula nana*-feeding species occurring in northern and central parts of Norway (incl. Dovre), Sweden, and Finland —has proved these to be conspecific. The name *biscutana* Wocke (1862), too, has to be replaced by *indecorana* Zetterstedt (1840).

It may be added that although *indecorana* looks very different from *E. similana* Hb. (*stroemiana* sensu Hannemann 1961: 160) regarding size and colouration, the pattern (dull in *indecorana*, distinct in *similana*) is similar and so far I have been unable to detect differences in the genitalia.

E. indecorana Zett. is known from West Greenland, northern and central parts of the Scandinavian peninsula, and Finland (see map on p. 64 fig. 54). *E. similana* Hb. occurs in North America (e.g. British Columbia, Quebec, Massachusetts) as well as in North and Central Europe and Northern Asia.

Occurrence in Greenland:

Exclusively found in West Greenland: between 60°43′ (Julianehåb) and 69°45′ (Eqe).

See map on p. 62 (fig. 45).

August.

Feeds on *Betula nana*.

Gelechiidae

41. ***Bryotropha similis*** STT.

Plate VI: fig. 7.

Genitalia: ♂ Plate XXI fig. 1, ♀ Plate XXI fig. 2 (signum).

In some localities in Greenland a *Bryotropha* species occurs numerously.

This genus comprises a number of closely allied, although distinct, species. The male genitalia are often very similar, but in most cases differences in the signum of the females can be established.

The female genitalia of the Greenland specimens proved to agree with those of Iceland and Newfoundland specimens, which in turn correspond with those of Danish as well as Swedish *similis* STT.

Mr. J. D. BRADLEY has been kind enough to check the correspondence between microphotographs of the genitalia of the Greenland *Bryotropha* (Plate XXI figs. 1–2) and the genitalia of *similis* syntypes ex. coll. STAINTON preserved in the British Museum (Natural History).

Distributed in Northern Europe, Iceland, Greenland, Newfoundland.

Occurrence in Greenland:

West Greenland: between 60°27′ (Ûnartoq) and 70° (Sarqaq). East Greenland: at 72°10′ (Mesters Vig). Not found in North Greenland.

See map on p. 62 (fig. 46).

July–August.

42. ***Phthorimaea valesiella*** STAUD.

Plate VI: fig. 8.

Genitalia: ♂ Plate XX fig. 1, Plate XIX fig. 5 (paratype of *Phthorimaea charcoti* MEYR.), Text fig. 6A, ♀ Text fig. 7A.

On the basis of 4 specimens collected in East Greenland in 1933 MEYRICK (1934: 59) described a *Phthorimaea* species under the name of *charcoti*. Mr. BRADLEY (BMNH) has kindly sent me for dissection a male paratype of *charcoti* as well as a photograph of the genitalia of the lectotype. Plate XIX fig. 5 shows the genitalia of the paratype.

This species was not refound in Greenland until 1955, when 4 additional specimens were collected, also in East Greenland (HÁLFDAN BJÖRNSSON leg.).

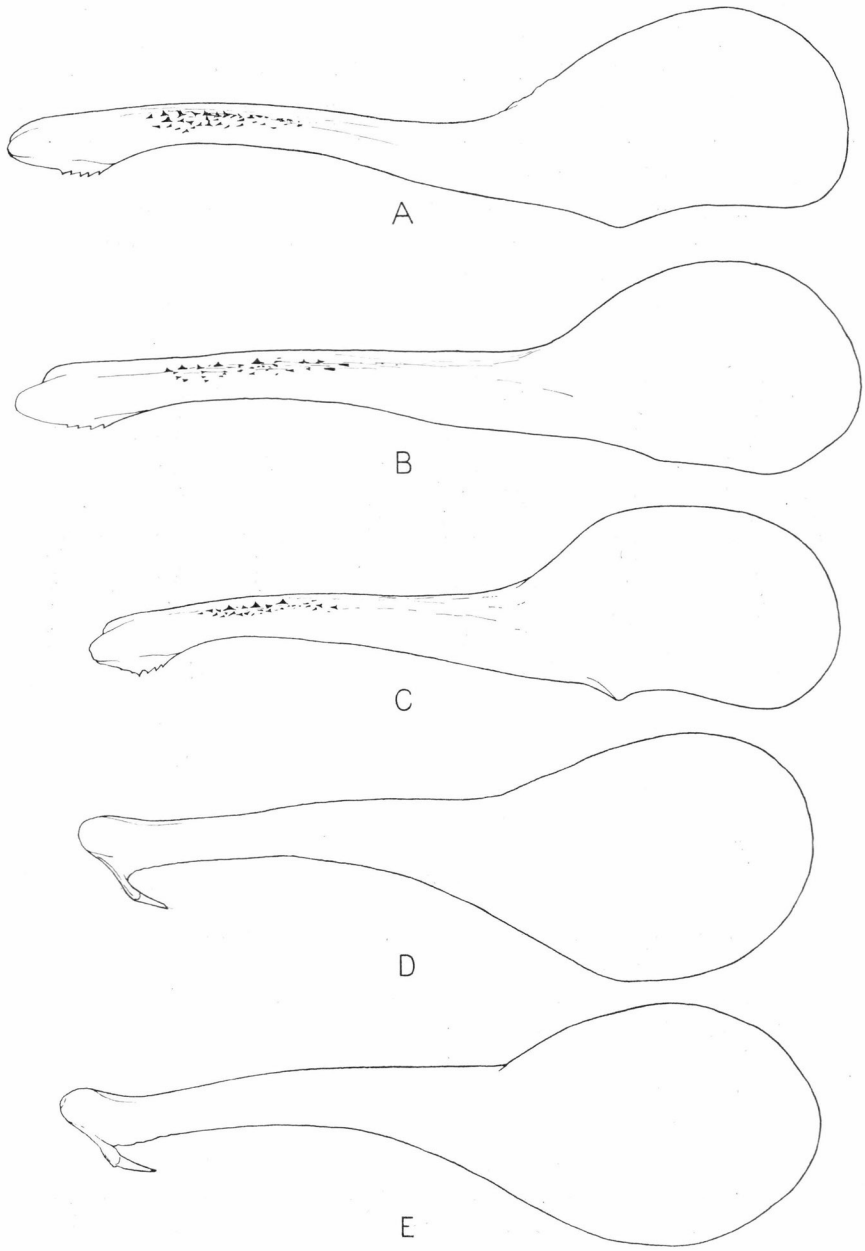


Fig. 6. Aedeagus (×150) of A–C: *Phthorimaea valesiella* STAUD., D–E: *Phthorimaea vibei* n. sp.

A: East Greenland, Mesters Vig 8.VII.1955 (prep. 2856), B: Lectotype of *valesiella*, Switzerland, Wallis (prep. 2859), C: Iceland, Esja VII.1947 (prep. 1890), D: Holotype of *vibei*, West Greenland, Søndre Strømfjord 20.VI.1952 (prep. 2730), E: Paratype of *vibei*, West Greenland, Søndre Strømfjord 20.VI.1952 (prep. 2729).

A: HÁLFDAN BJÖRNSSON leg., B: ex coll. Zool. Mus. Berlin via coll. STAUDINGER, C: G. GIGJA leg., D, E: CHR. VIBE leg.

In a paper dealing with some Finnish species belonging to the *Phthorimaea streliciella* HS.-group, VON SCHANTZ (1952: 15–22) has illustrated the genitalia of two species, viz. *hackmani* n. sp. and *diabolicella* HER. The genitalia of the Greenland *charcoti* MEYR. looked very similar to *hackmani* as well as *diabolicella*.

Concerning these two species HACKMAN (1960, Not. Ent. *40*: 155) states *diabolicella* HER. (1924) to be conspecific with a specimen of

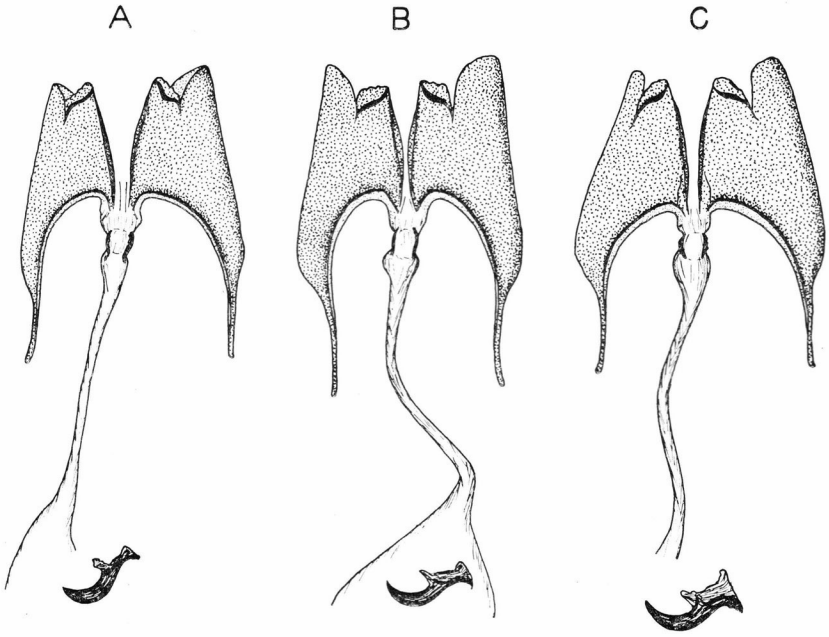


Fig. 7. Female genitalia (×45) of *Phthorimaea valesiella* STAUD.

A: East Greenland, Mesters Vig 8.VII.1955 (prep. 2854), B: Lectoallotype of *valesiella*, Switzerland, Wallis (prep. 2882), C: Paratype of *hackmanni* VON SCHANTZ, Finland, St. Säkylä 14.VI.1950 (prep. 2854).

A: HÁLFDAN BJÖRNSSON leg., B: ex coll. Zool. Mus. Berlin via coll. STAUDINGER, C: M. VON SCHANTZ leg.

Phthorimaea valesiella STAUD. preserved in coll. Übersee-Museum in Bremen, and VON SCHANTZ has later informed me that his recent opinion is that also *hackmani* VON SCHANTZ (1952) belongs to *valesiella* STAUD. The type material of *Phth. valesiella* STAUDINGER (1877: 205–206) is in the Humboldt Museum in Berlin, and through the kindness of Dr. HANNEMANN I have been able to study 4 syntypes and to designate lectotypes.

As appears from Plate XX figs. 1–2 and Text fig. 7 A–B, the genitalia in both sexes of the East Greenland *Phthorimaea* species are identical with those of the lectotypes of *valesiella* STAUD. In addition text

fig. 7C shows the genitalia of a female paratype of *Phth. hackmani* VON SCHANTZ, proving this species as well to be conspecific with *valesiella* STAUD.

It may be added that my examination of several specimens of the Icelandic *Phthorimaea* recorded under the name of *streliciella* HS. has brought to light that even the Icelandic species in question must be referred to *valesiella* STAUD.

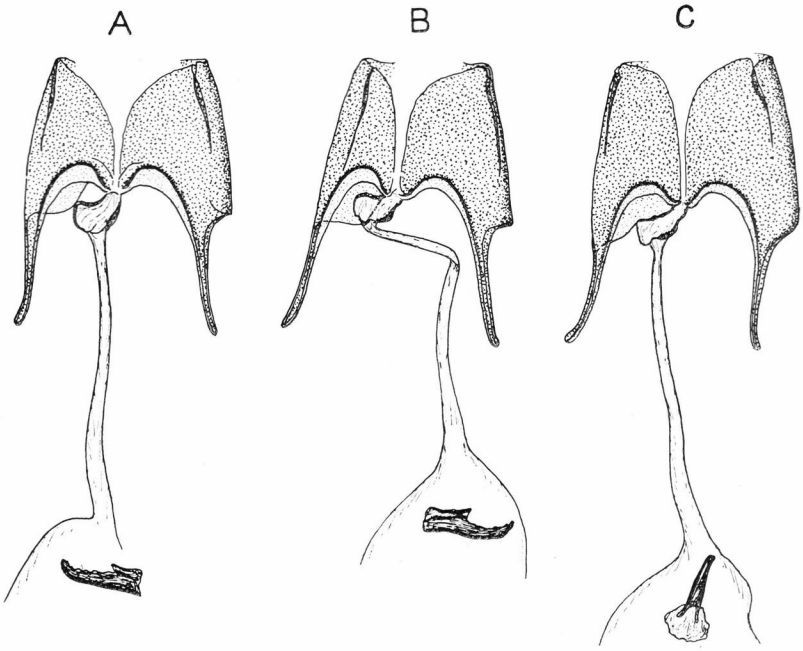


Fig. 8. Female genitalia (×45) of *Phthorimaea vibei* n. sp.

A: Allotype, B–C: Paratypes, all West Greenland, Utorqait 3.VII.1936 (preps. 2911, 2881, 2880).

A, B, C: H. G. VEVERS leg.

Text fig. 6A, B, C shows the aedeagus of three specimens of *Phthorimaea valesiella* from Greenland, Switzerland (lectotype), and Iceland, respectively.

Phth. valesiella is a boreo-alpine species, known from Wallis, the Tyrol, the Caucasus, Finland, Northern Sweden, Iceland, and Greenland.

Occurrence in Greenland:

Exclusively found in East Greenland: at 69°24′ (Kap Dalton) and 72°10′ (Mesters Vig).

See map on p. 63 (fig. 47).

July–August.

43. ***Phthorimaea vibei*** n. sp.

Genitalia: ♂ Plate XX fig. 3 (holotype), fig. 4 (paratype), Text fig. 6 D (holotype), E (paratype), ♀ Text fig. 8 A (allotype), B–C (paratypes).

The material collected by CHR. VIBE in West Greenland at 67° (Søndre Strømfjord) included two extremely worn male specimens of a *Phthorimaea* species the genitalia of which (Plate XX figs. 3–4) differ distinctly from those of *Phth. valesiella* STAUD. (Plate XX figs. 1–2).

From another locality in West Greenland, likewise at 67° (Utorqait), three *Phthorimaea* specimens, identified as *charcoti* MEYR., had previously been recorded (CARPENTER 1938: 534, HENRIKSEN 1939: 39).

Mr. J. TAYLOR (Hope Dept. Univ. Oxford) has kindly allowed me to examine the genitalia of the last-named specimens. All were females and as the genitalia proved to differ from those of *valesiella* it can hardly be doubted that these specimens represent the female of the species just mentioned, which seems to be undescribed.

Phthorimaea vibei n. sp.

5 specimens (2 ♂♂, 3 ♀♀) known. Due to their bad condition little can be stated as to the general appearance. Forewings dark grey, three black spots on the wing more distinct than in the Greenland specimens of *valesiella*. Apical costal patch whitish. Size as *valesiella*.

The male genitalia differ from those of *valesiella*, especially as regards the shape of the costal arms and the aedeagus. In *vibei* the costa is stout, apically pointed, definitely inwards curving, in *valesiella* irregular in shape, twisted, and in the preparations generally outwards curving. As shown in text fig. 6 D–E the aedeagus in *vibei* is smooth and carries a single thorn attached to the orifice while *valesiella* has the aedeagus set with minute spines, and the orifice slightly serrated.

As appears from text fig. 8 the female genitalia of *vibei* differ from those of *valesiella* especially in the shape of the 8th sternite, in the ductus bursae (the antrum being asymmetrical), and in the signum, which is less regularly curved and less sharply pointed in *vibei* than in *valesiella*.

Named in honour of Mr. CHR. VIBE, Leader of the Danish Zoogeographical Investigations in Greenland.

Holotype and male paratype kept in the Zoological Museum of Copenhagen. Allotype and female paratypes kept in the Hope Department of the University of Oxford.

Occurrence in Greenland:

Exclusively found in West Greenland: at 67° (Søndre Strømfjord, Utorqait in Amerdloq).

See map on p. 63 (fig. 47).

June–July.

Oecophoridae

44. *Agonopteryx victori* DE LESSE & VIETTE.

Plate VI: fig. 9.
Genitalia: ♂ Plate XIX fig. 4, DE LESSE & VIETTE 1949 p. 91 fig. 13, ♀ Text fig. 9A, DE LESSE & VIETTE 1949 p. 88 fig. 9.

This species was described from Greenland in 1949 on the basis of several specimens bred from larvae collected at Eqe by DE LESSE. The

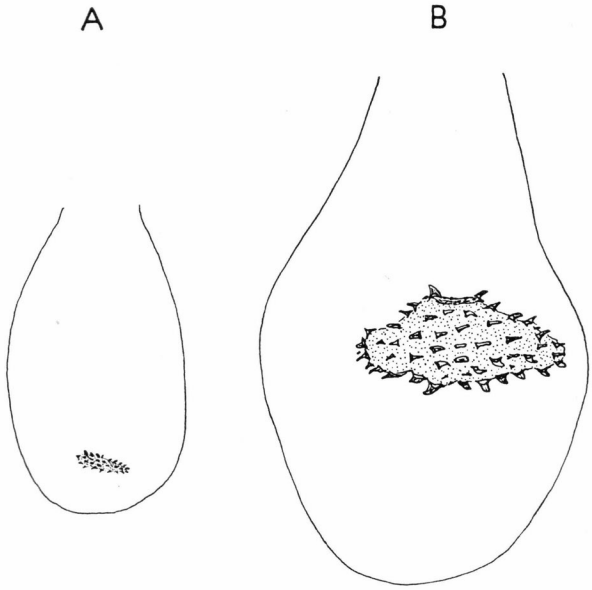


Fig. 9. Bursa (×45) of A: *Agonopteryx victori* DE LESSE & VIETTE, B: *Agonopteryx ocellana* F.

A: West Greenland, Narssarssuaq, found dead ult. VIII.1962 (prep. 2878), B: Denmark, Fanø 29.VIII.1953 (prep. 2874).

A, B: NIELS L. WOLFF leg.

species has also been met with at Narssarssuaq (a hibernated specimen, CHR. VIBE leg., 3 specimens found dead indoors, NIELS L. WOLFF leg.), and at Narssaq (a single specimen found among some Greenland *Diptera* in the Zool. Mus. Copenh.).

Seems most closely allied to *A. ocellana* F., but differs in the shape of the wings, these being more elongate. The male genitalia are very similar to those of *ocellana*, but in the female the bursa (incl. the signum) is entirely different from that of *ocellana* (text fig. 9A–B).

Not noticed outside Greenland.

Occurrence in Greenland:

Known only from West Greenland: at 60° (Narssaq[1]), 61°10′ (Narssarssuaq) and at 69°45′ (Eqe).

See map on p. 63 (fig. 48).

Appears in the autumn (August–September) and, after hibernation, again in the spring (May).

Reared from *Antennaria alpina*.

45. ***Endrosis sarcitrella*** L. (***lactella*** DEN. & SCHIFF.)

A chiefly indoor species of universal distribution preferably feeding on various dry vegetable refuse, etc.

Occurrence in Greenland:

Known only from West Greenland: at 10 different places between 60°43′ (Julianehåb) and 69°44′ (Ritenbenk).

June–October.

46. ***Hoffmannophila pseudospretella*** STT.

Occurring in houses in all parts of the world, especially in cool climates, feeding on seeds, wool, dried vegetable, animal refuse, etc.

Occurrence in Greenland:

Known only from West Greenland: at 60°43′ (Julianehåb).

[A specimen, "clearly introduced" (LACK 1934: 604), observed on board a foreign vessel during her stay at Scoresbysund can hardly be included among insects found in East Greenland].

September–November.

Hyponomeutidae

47. ***Plutella senilella*** ZETT.

Plate VI: figs. 10–11.

Genitalia: ♂ DE LESSE & VIETTE 1949 p. 84 fig. 2, ♀ DE LESSE & VIETTE 1949 p. 88 fig. 11.

Distributed in the mountains of Central Europe, Fennoscandia, the British Isles to the Shetlands, the Faroes, Iceland, and Greenland from where this species was described in 1840.

Occurrence in Greenland:

West Greenland: between 60° (Frederiksdal) and 69°45′ (Eqe). East Greenland: between 65°35′ (Angmagssalik) and 72°50′ (Ella Ø). Not found in North Greenland.

See map on p. 63 (fig. 49).

[1]) Not shown on the map.

August–September and, after hibernation, again in the spring (May–June). Extremely numerous, attracted by lamps, at Narssarssuaq in September 1962.

48. ***Plutella maculipennis*** CURT.

The Diamond Back Moth is one of the most universally distributed Lepidoptera, flourishing equally well in cold and hot climates. Sometimes this species immigrates in huge swarms counting thousands of millions of individuals.

Occurrence in Greenland:

A single specimen taken on 17th July 1956 (CHR. VIBE leg.) in East Greenland at 70°40′ (Jameson Land).

See map on p. 63 (fig. 49).

Scythrididae

49. ***Scythris noricella*** ZELL.

Plate VI: fig. 12.
Genitalia: ♂ Plate XIX fig. 3, DE LESSE & VIETTE 1949 p. 84 figs. 4 and 6, ♀ DE LESSE & VIETTE 1949 p. 84 fig. 5.

In previous lists of Greenland Lepidoptera (HENRIKSEN & LUNDBECK 1917: 698, HENRIKSEN 1939: 39) this species is recorded as ? *noricella* ZELL.

Examination of the genitalia of both sexes of Greenland specimens has not disclosed any difference from those of *noricella* specimens from Switzerland and Northern Sweden. On the other hand the Greenland specimens differ from typical *noricella* regarding their size. The average alar expanse of the Greenland population is about 14.5 mm (an extraordinarily large specimen measures 15.7 mm) while Central European as well as northern Scandinavian examples on an average measure 18–19 mm, and often reach 21 mm in wing expanse.

The Greenland population must be considered a local form, *latifoliella* n. ssp., the characteristic feature of which being the small size of the individuals as compared with that of typical specimens. The type (labelled Disko, Godhavn 17.VIII.1962, Niels L. Wolff leg.) is preserved in the Zoological Museum of Copenhagen.

S. noricella is distributed in mountains of Central Europe, boreal-alpine parts of Finland, the northernmost part of the Scandinavian peninsula, and Greenland.

Occurrence in Greenland:

Known only from West Greenland: between 60°43′ (Julianehåb) and 70°25′ (Qarajaq).

See map on p. 63 (fig. 50).

July-August.

Reared from *Chamaenerion latifolium.*

Tineidae

50. ***Monopis rusticella*** HB.

Genitalia: ♂ Plate XXI fig. 4.

Distributed in Central and Northern Europe, Asia Minor, North America, especially near houses, feeding on wool and various refuse, also breeding in birds' nests.

Occurrence in Greenland:

Known only from West Greenland: a single specimen (♂) at 60°55′ (Bredefjord on 5th August 1948, CHR. VIBE leg.) and 3 specimens (♀♀) found dead indoors at 61°10′ (Narssarssuaq ult. August 1962, NIELS L. WOLFF leg.).

51. ***Niditinea (Tinea) fuscipunctella*** HAW.

Genitalia: ♂ Plate XXI fig. 3.

A cosmopolitan species feeding on nearly any sort of dry animal and vegetable refuse.

Occurrence in Greenland:

A single specimen (♂) found (probably about 1900) in East Greenland (no exact locality stated).

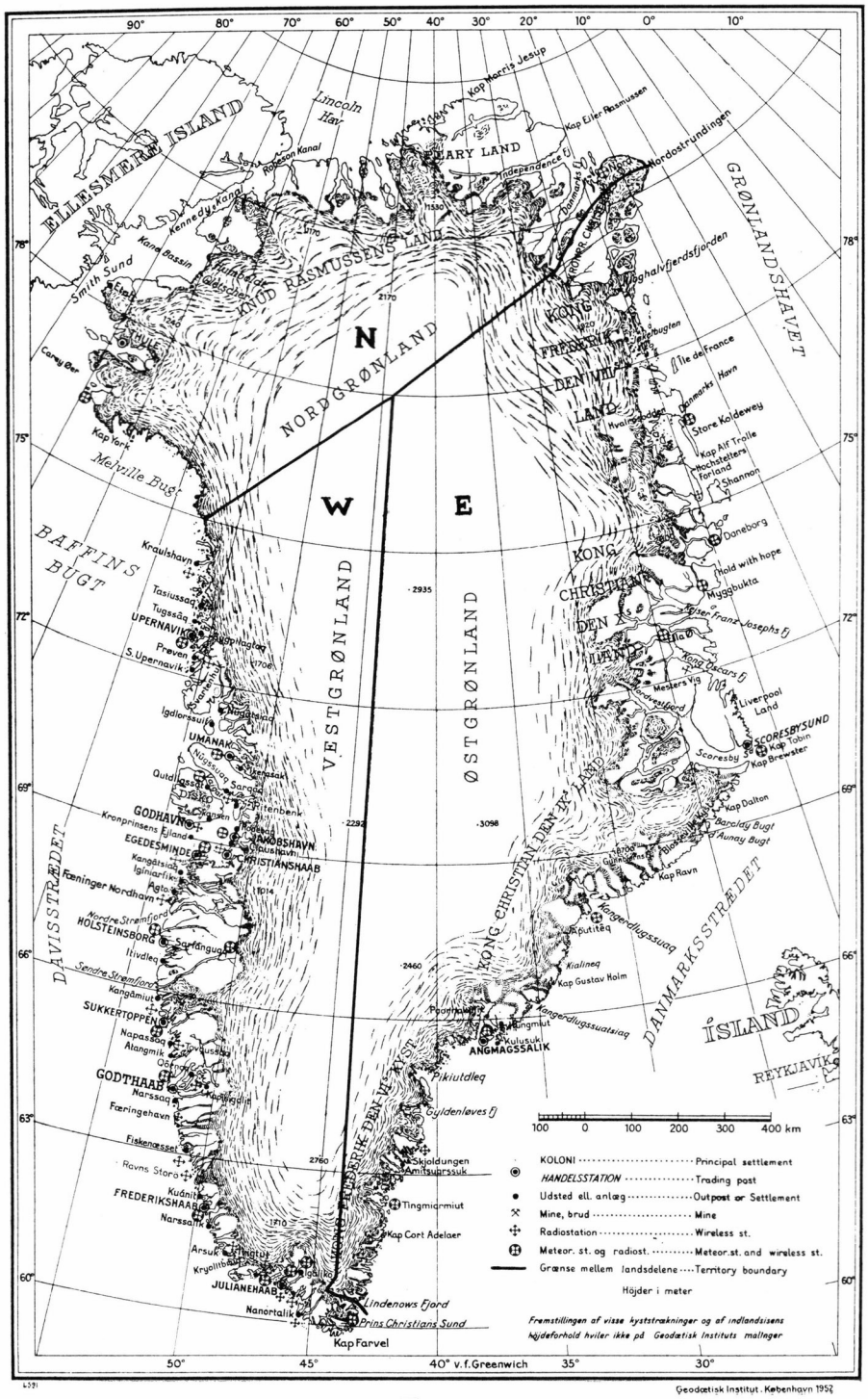
52. ***Tineola bisselliella*** HUMM.

The Cloth Moth has become a destructive pest all over the world, damaging wool, clothes, etc.

Occurrence in Greenland:

Found in West Greenland at 60°43′ (Julianehåb) in immense numbers.

August.


ELLESMERE ISLAND
Lincoln Hav
Robeson Kanal
Kennedy Kanal
Kane Bassin
Smith Sund
Hall Bredde
Grønlandshavet
Kap Morris Jesup
Kap Eilert Rasmussen
Nordostrundingen
Independence fj
KNUD RASMUSSENS LAND
Thule
Carey Øer
Kap York
Melville Bugt
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S. Upernavik
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UMANAK
Qutdligssat
GODHAVN
Kronprinsens Øerne
EGEDESMINDE
JAKOBSHAVN
KRISTIANSHAAB
Færinger Nordhavn
HOLSTEINSBORG
Sarfangup
Itivdleq
Sydre Strømfjord
Kangâmiut
SUKKERTOPPEN
Napasoq
Alangmik
GODTHAAB
Narssaq
Færingehavn
Fiskenæsset
Ravns Storø
FREDERIKSHAAB
Kuânit
Narssalik
Arsuk
Kryolitbanen
JULIANEHAAB
Nanortalik
Kap Farvel
VESTGRØNLAND
ØSTGRØNLAND
DAVISSTRÆDET
KONGE FREDERIK DEN VIII's LAND
KONGE CHRISTIAN DEN X's LAND
KONGE CHRISTIAN DEN IX's LAND
Ile de France
Danmarks Havn
Store Koldewey
Kap Alf Trolle
Hochstetters Forland
Shannon
Daneborg
Hold with hope
Myggbukta
Franz Josephs fj
Kong Oscars fj
Liverpool Land
SCORESBYSUND
Kap Tobin
Kap Brewster
Scoresby Sund
Kap Dalton
Barclay Bugt
Aunay Bugt
Kap Ravn
Kangerdlugssuaq
Kialineq
Kap Gustav Holm
Kangerdlugssuatsiaq
Tingmiut
Kulusuk
ANGMAGSSALIK
Pikiutdleq
Gyldenløves fj
Skjoldungen
Amitsuarssuk
Tingmiarmiut
Kap Cort Adelaer
Lindenows Fjord
Prins Christians Sund
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KOLONI · Principal settlement
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Grænse mellem landsdelene · · · · Territory boundary
Højder i meter
Fremstillingen af visse kyststrækninger og af indlandsisens højdeforhold hviler ikke på Geodætisk Instituts målinger
Geodætisk Institut · København 1952

Fig. 10,

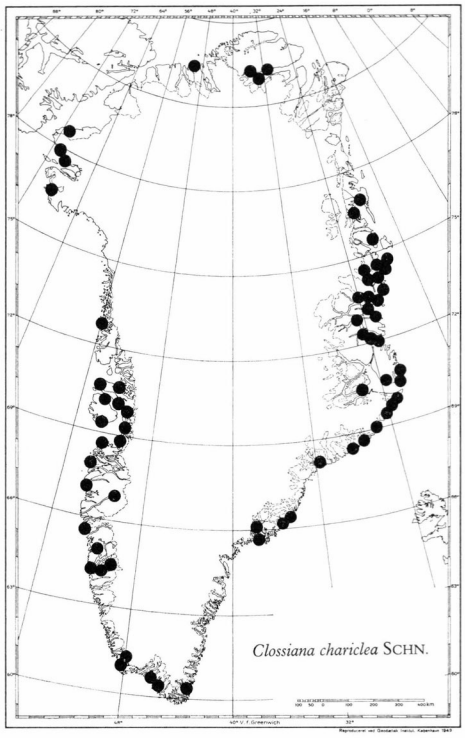


Fig. 11.

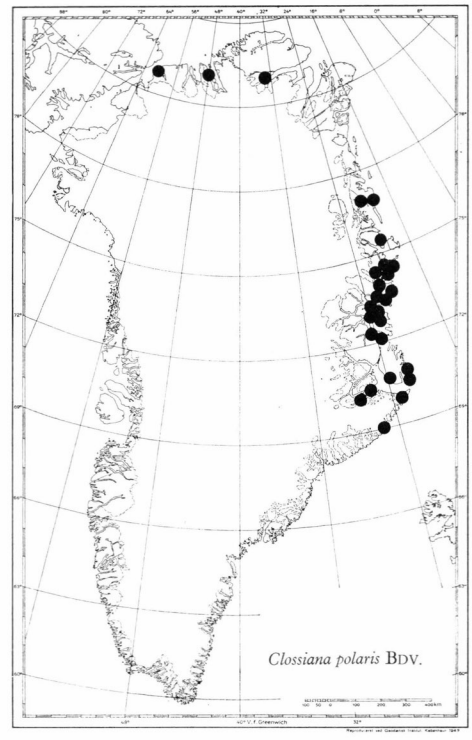


Fig. 12.

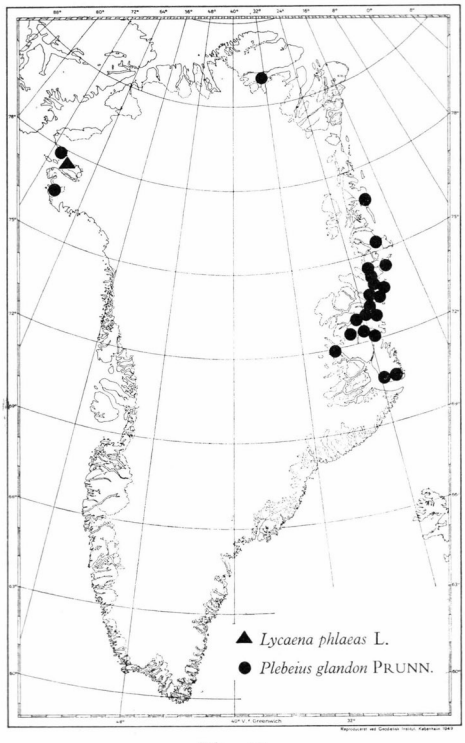


Fig. 13.

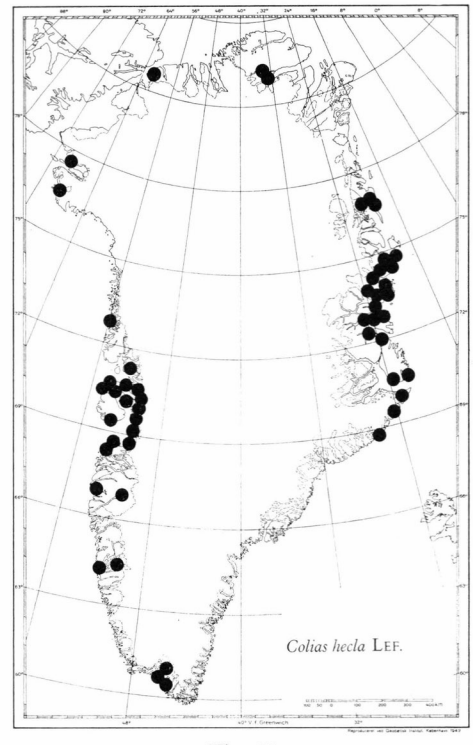


Fig. 14.

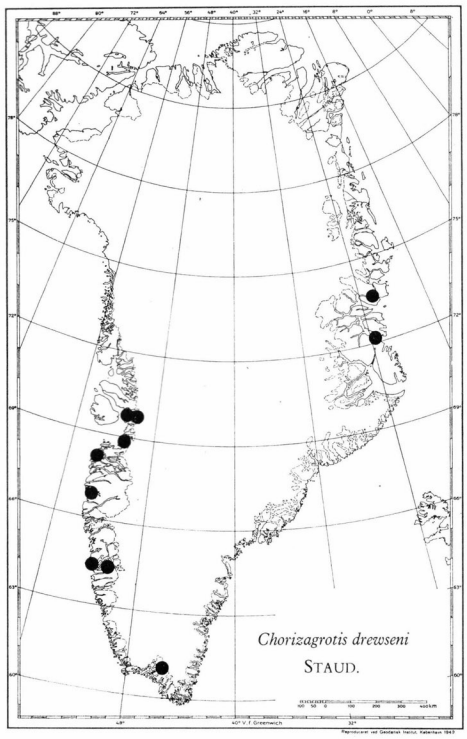


Fig. 15.

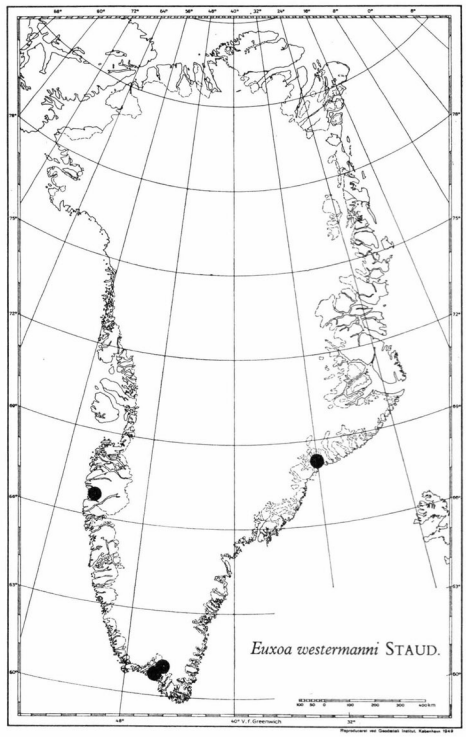


Fig. 16.

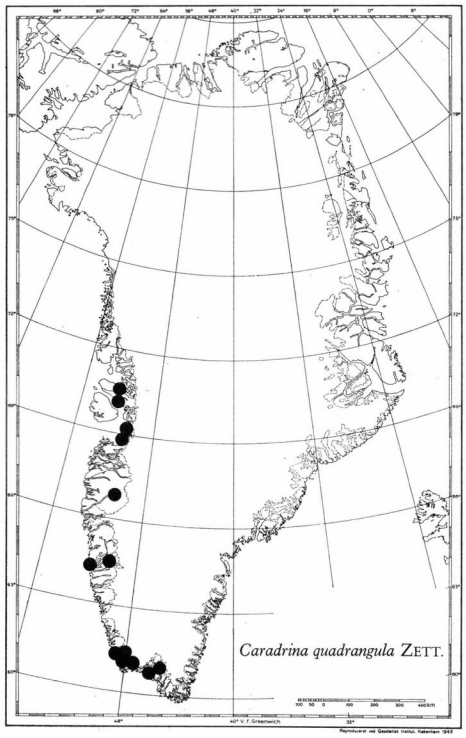


Fig. 17.

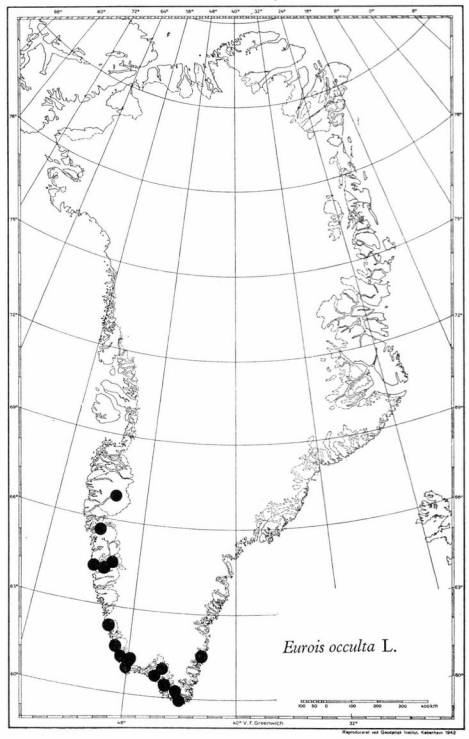


Fig. 18.

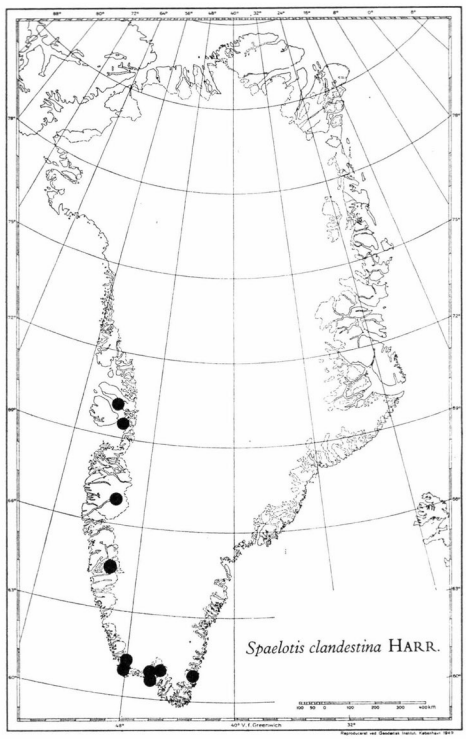


Fig. 19.

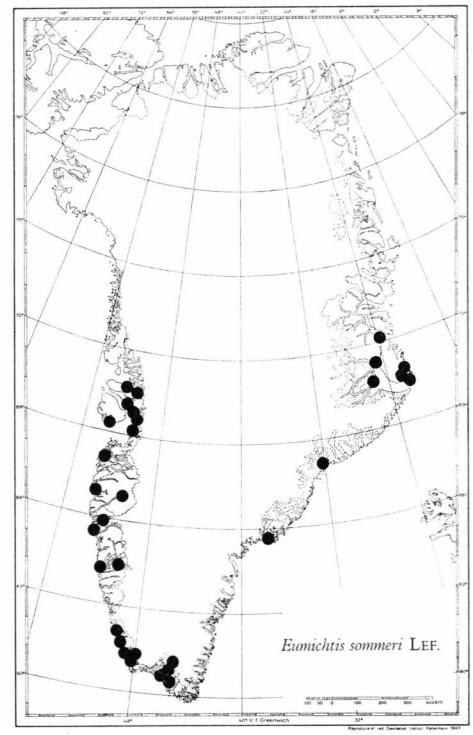


Fig. 20.

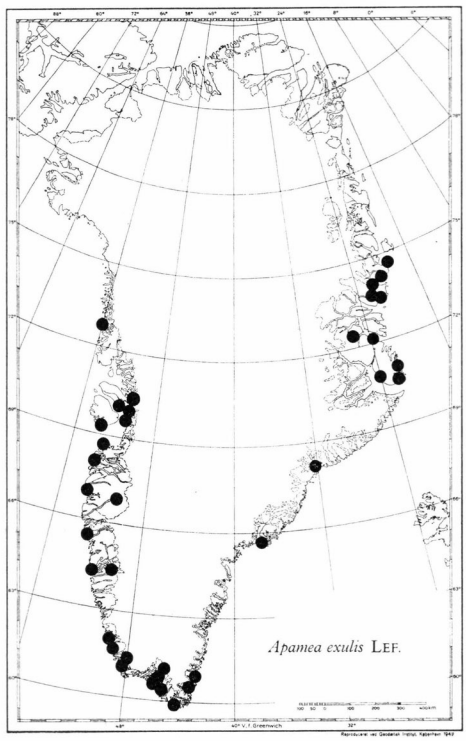
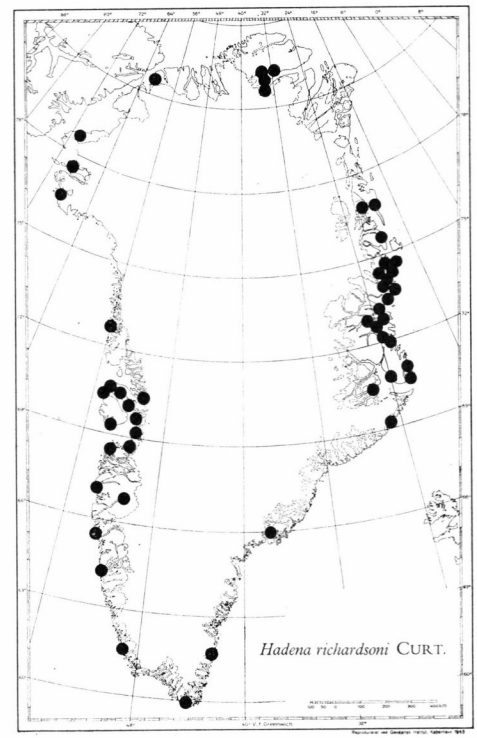


Fig. 21.



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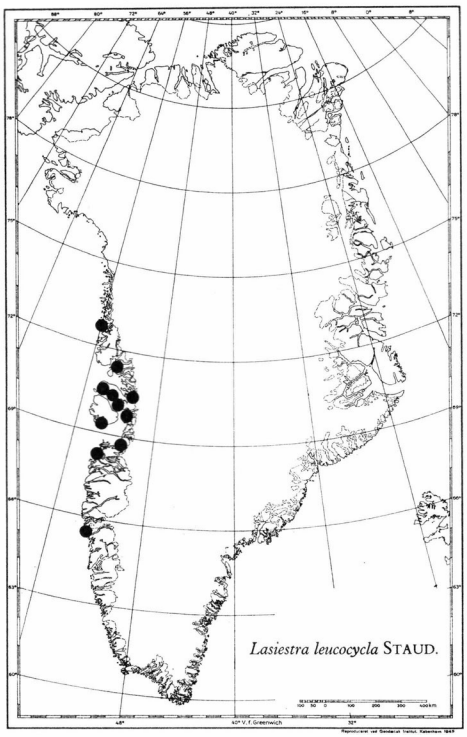

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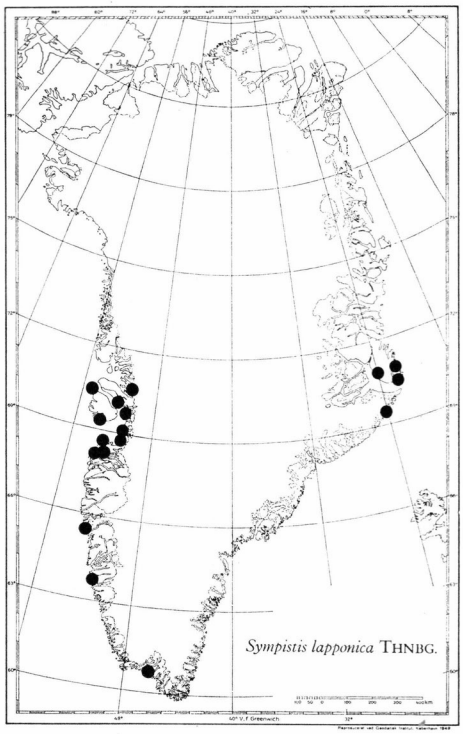

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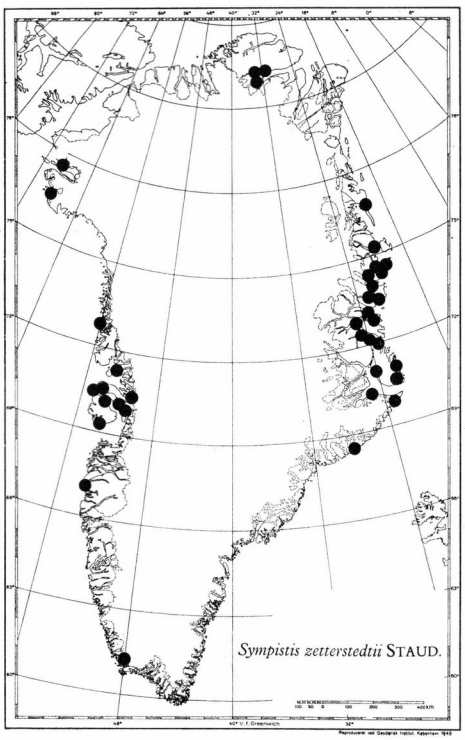

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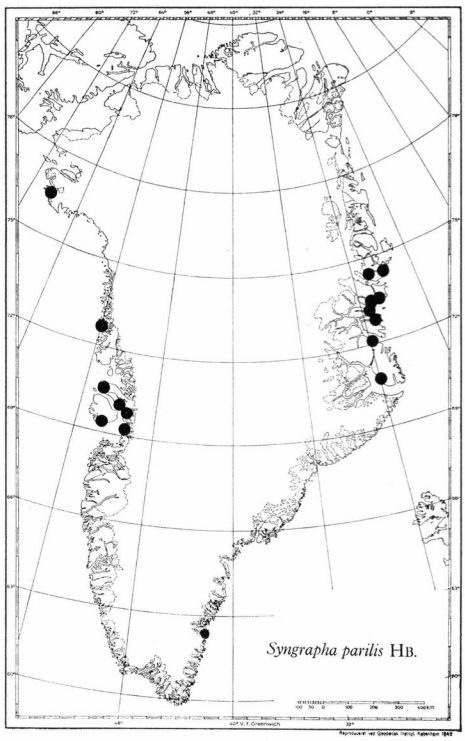

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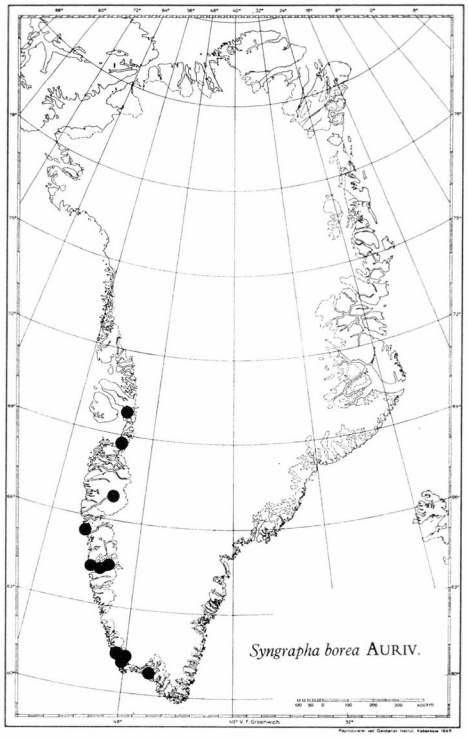

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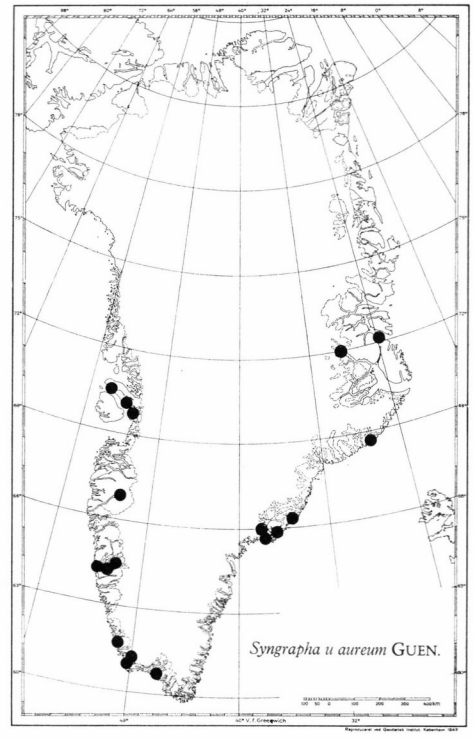

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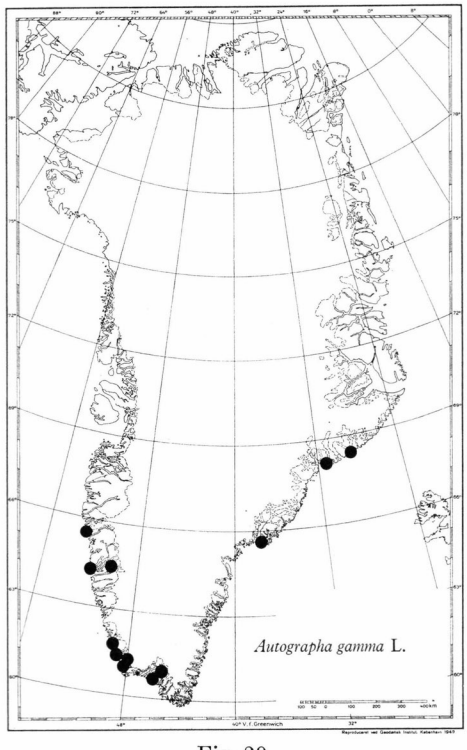

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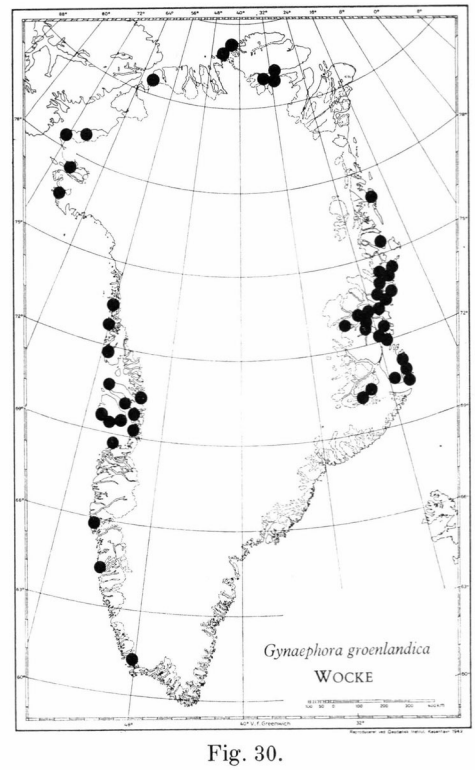

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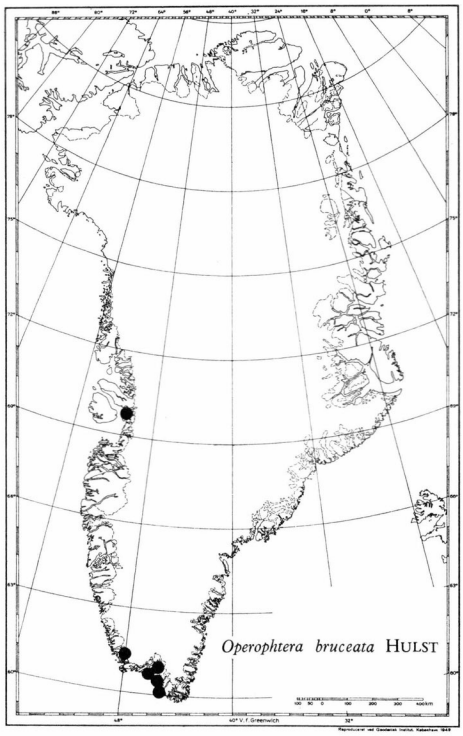

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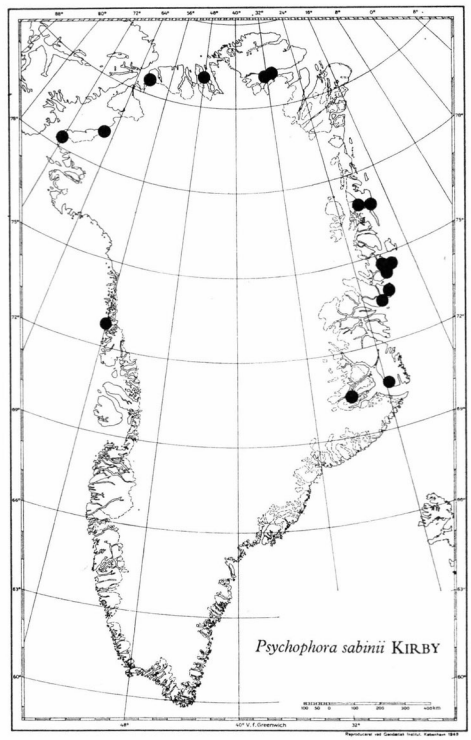

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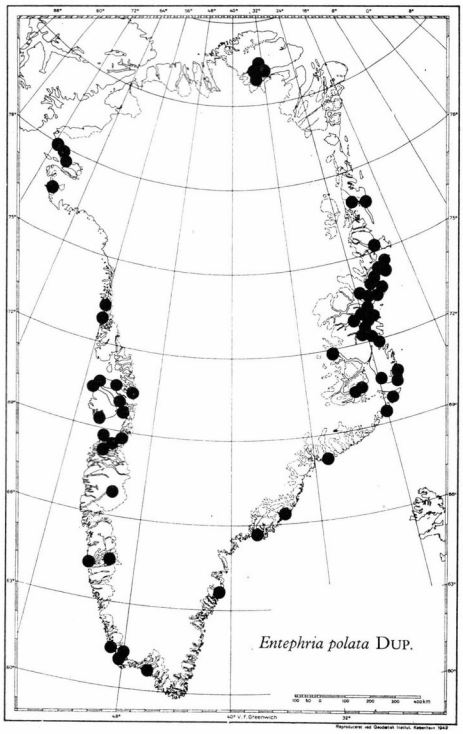

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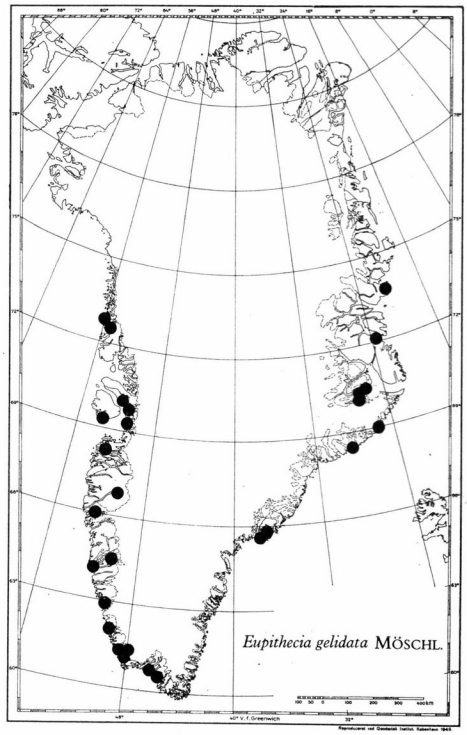

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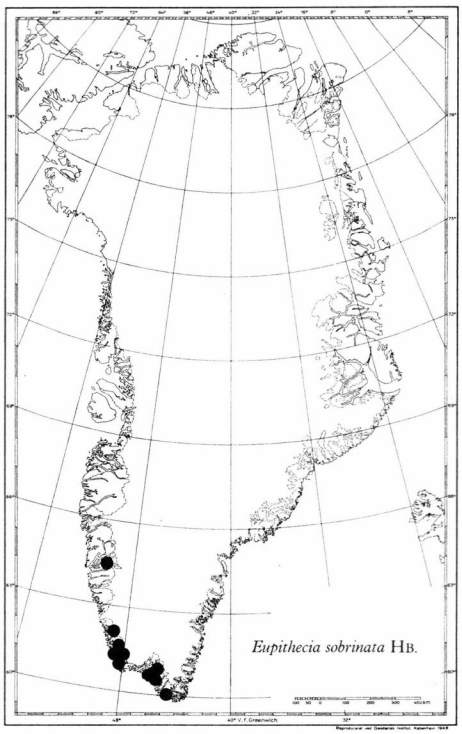

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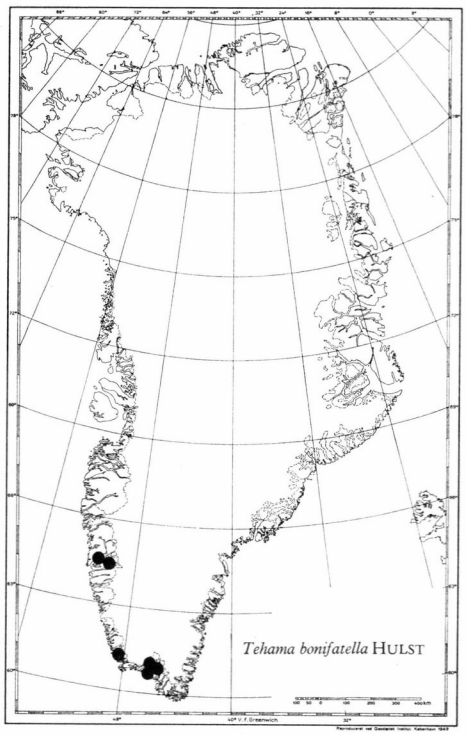

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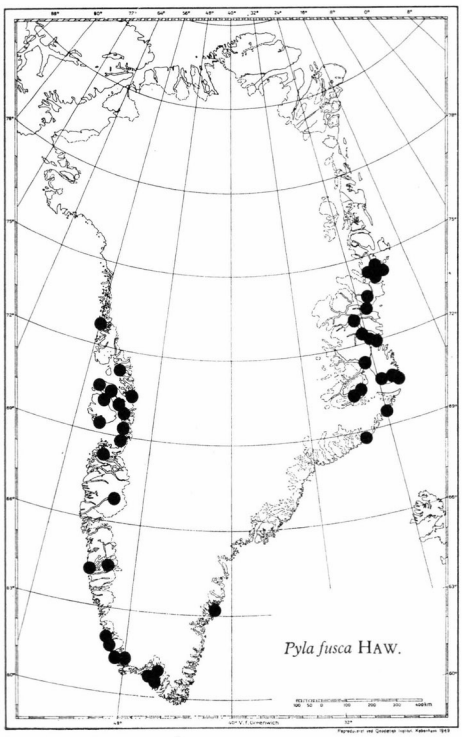

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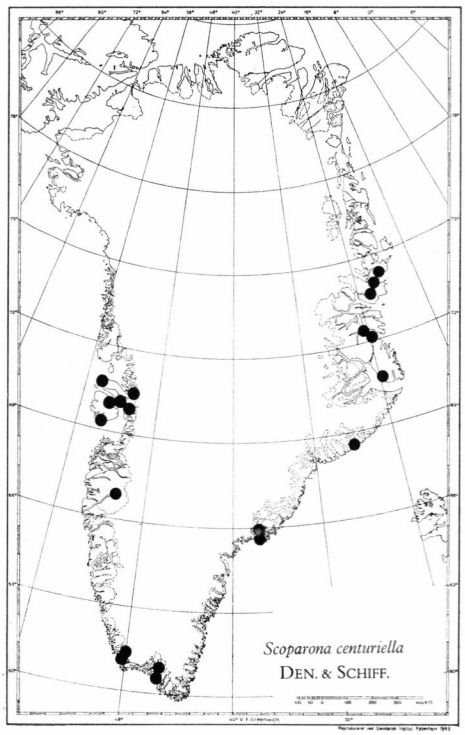

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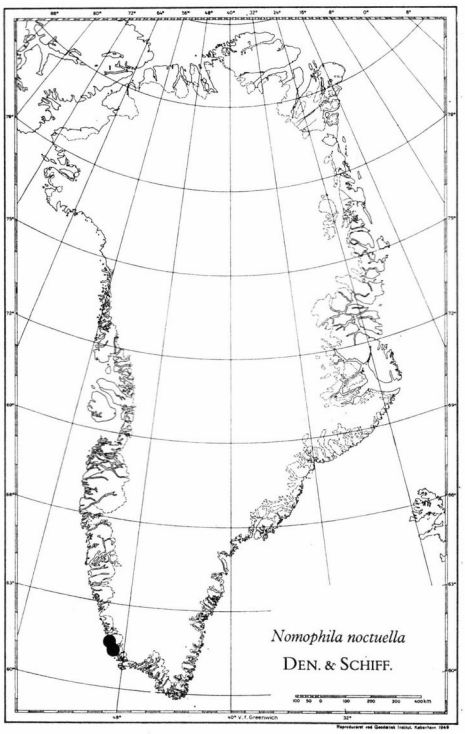

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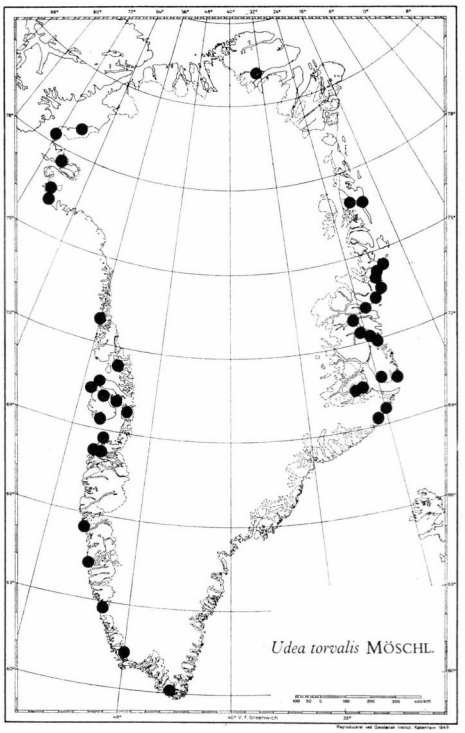

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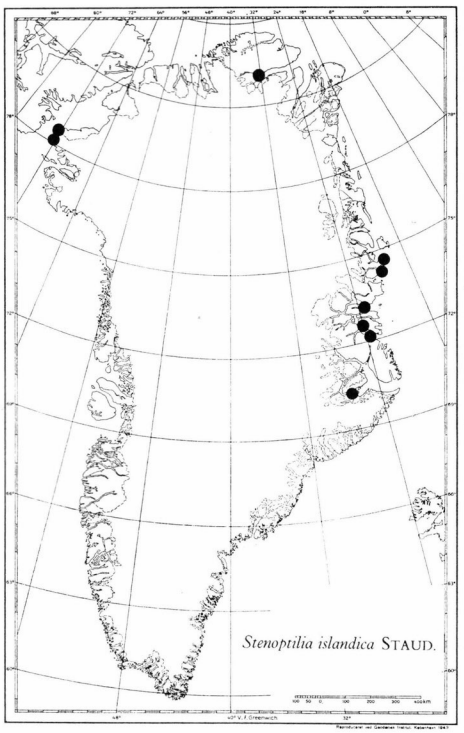

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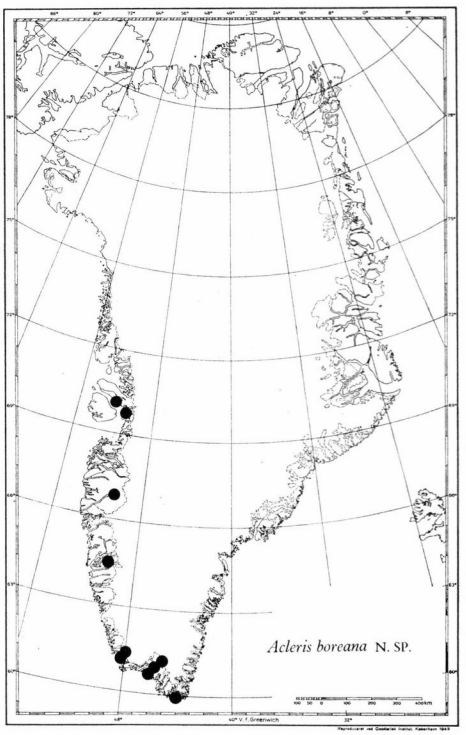

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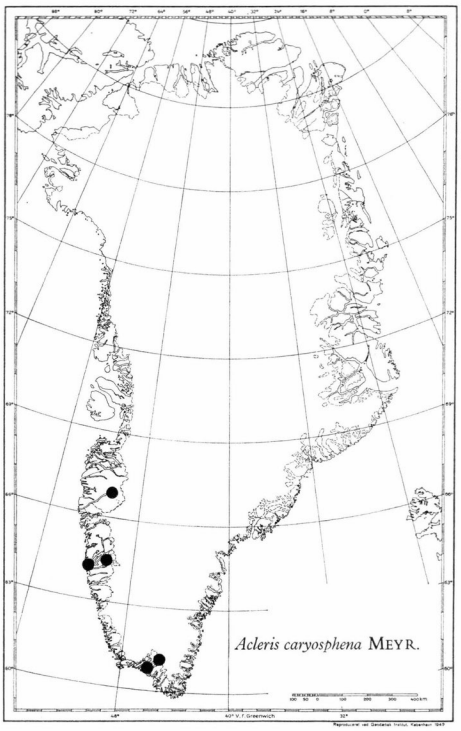

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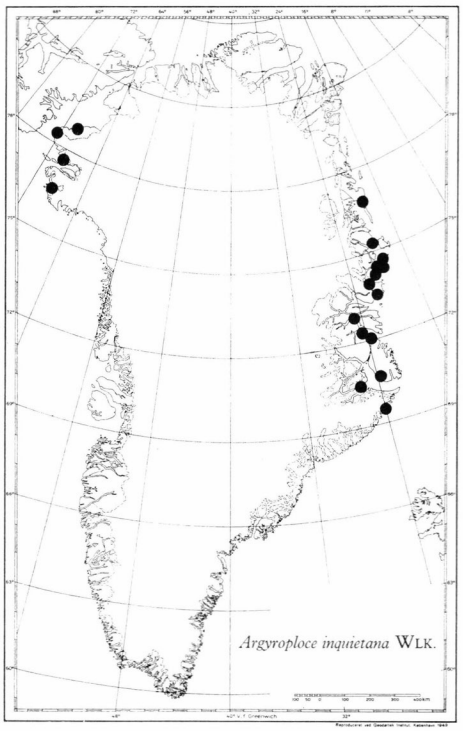

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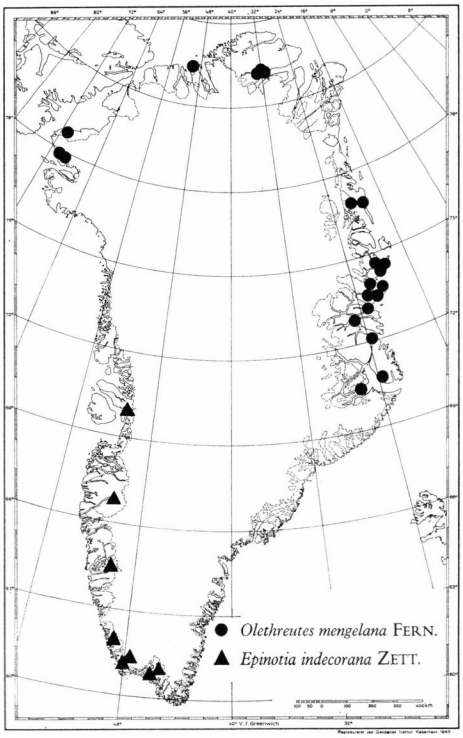

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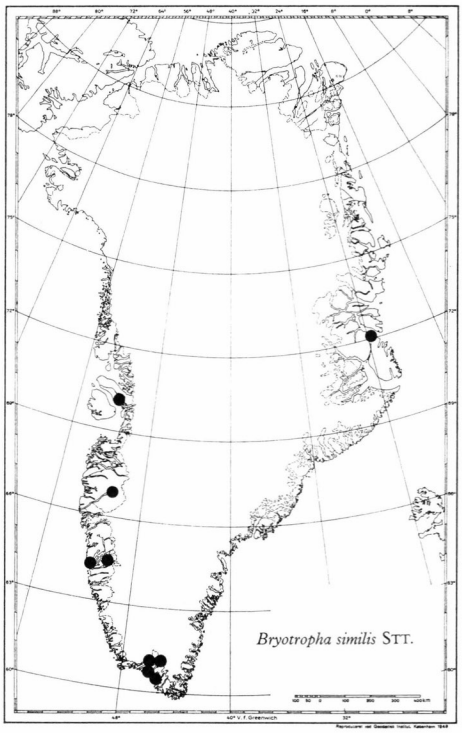

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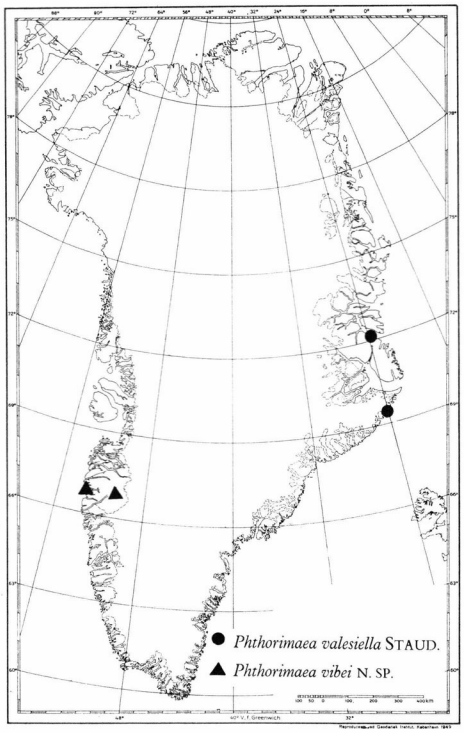

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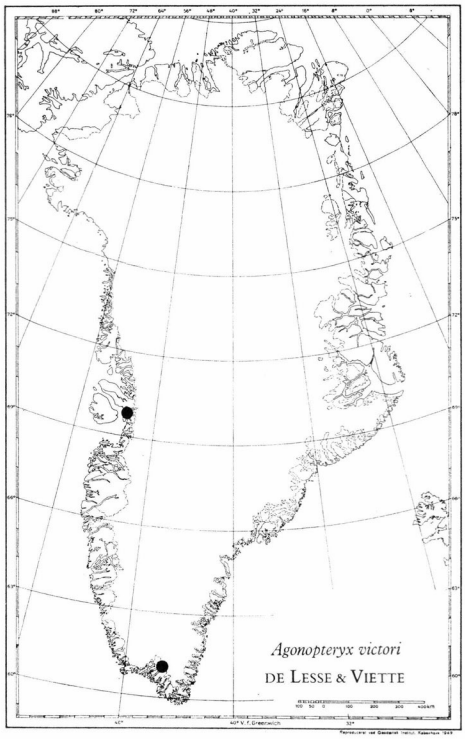

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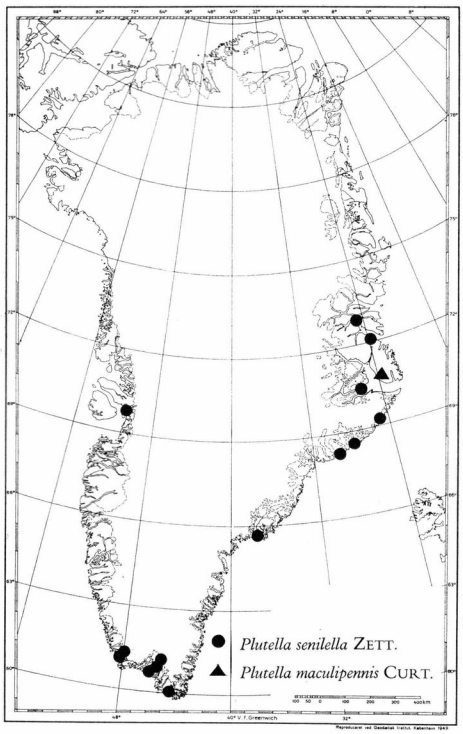

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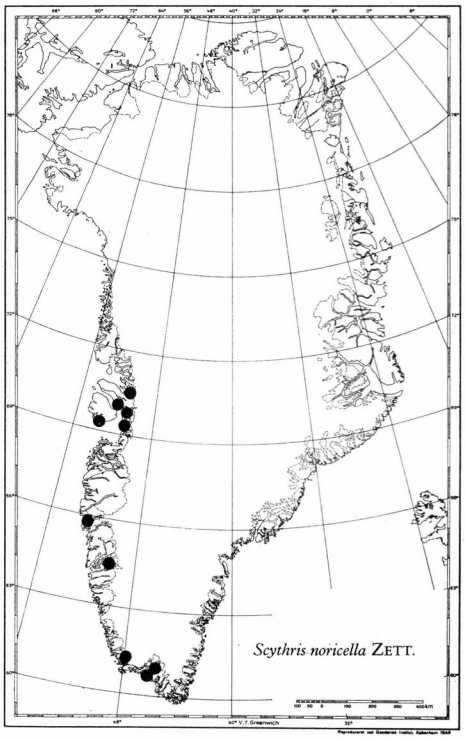

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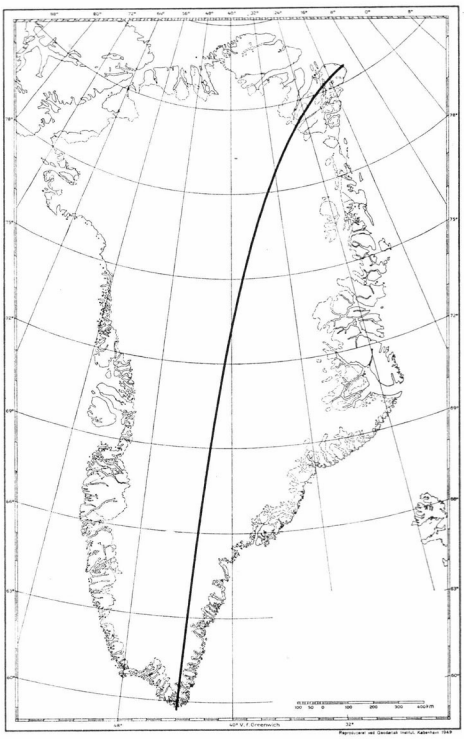

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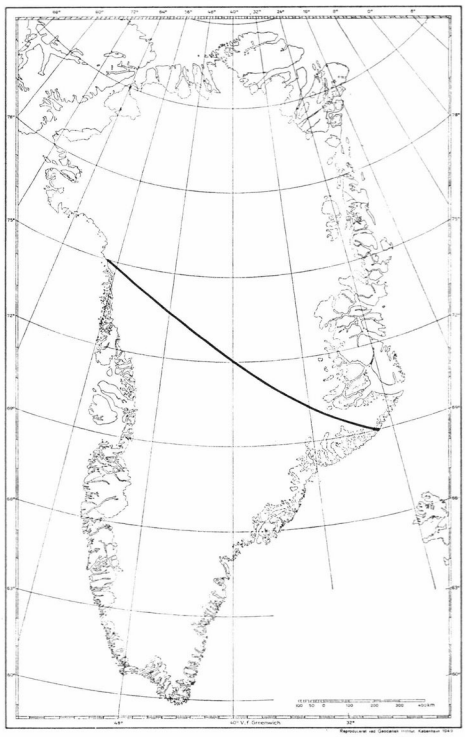

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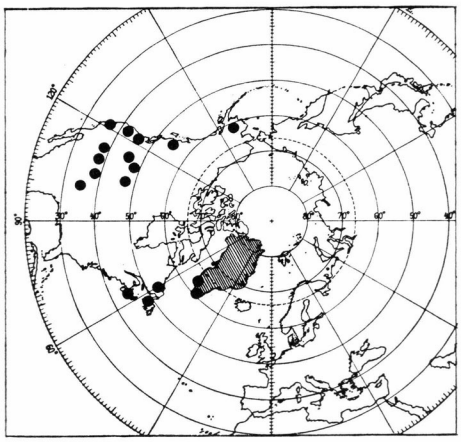

Fig. 53. Distribution of *Tehama bonifatella* HULST (black circles).

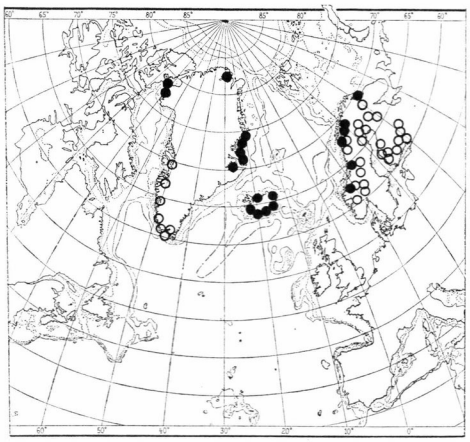

Fig. 54. Distribution of *Stenoptilia islandica* STAUD. (black circles), and *Epinotia indecorana* ZETT. (white circles).

GENERAL REMARKS

As the present paper chiefly aims at ascertaining the identity of the species of Lepidoptera known to occur in Greenland, and not to discuss the origin of the fauna proper, only a few additional remarks in order to analyse the zoogeographical status of the Greenland species will have to be added.

Taking into consideration the enormous extent of the country, reaching 2,670 km, from 83°39′ lat. N. (Kap Morris Jesup) in the north to 59°46′ lat. N. (Kap Farvel) in the south, the number of Lepidoptera species known is extremely small. Although 84 per cent. of the total area of Greenland (2,175,600 sq. km) is permanently covered with ice, it must be remembered that there still remain ice-free territories along the coasts amounting to respectively 119,000 sq. km in the west, 107,000 sq. km in the north, and 116,000 sq. km in the east, of which in summer time large parts are grown with vegetation far from being poor. Among others the blue *Campanula*, the yellow *Papaver*, and the scarlet *Chamaenerion*, the national flower of Greenland, throw their gleam of colour over the scenery.

A total of more than 500 vascular plants are known from Greenland, and in several areas along the coasts scrubs of *Betula* and *Salix* occur, in sheltered places in the south developing into trees reaching several metres in height.

In spite of this the number of Lepidoptera listed above (52) is smaller than is known at present from Iceland (71) or even from the minute group of Atlantic islands, the Faroes (55). This limited number of species occurring in Greenland as compared with the two last-named areas is remarkable, especially taking into account that the climate of Greenland permits the presence of not less than 11 sun-loving Lepidoptera (5 butterflies and 6 noctuid moths) unable to exist in Iceland as well as in the Faroes.

As compared with the fauna of the Scandinavian countries, the number of Greenland Lepidoptera species amounts to but 1/50 of those of the Scandinavian peninsula (2,500), although Greenland extends farther south than e. g. Oslo, the capital of Norway.

Future collecting will certainly add some species to the list, but as a whole our present knowledge of the Lepidoptera fauna is not unsatisfactory. As also appears from the maps (p. 54–63) but few districts, especially in the north and northeast, have completely escaped the activities of collectors.

Native Species

Although only 52 Lepidoptera are found in Greenland, even this number has to be decreased in order to arrive at the true number of indigenous Lepidoptera.

Eight species (28. *Plodia interpunctella*, 29. *Anagasta kühniella*, 30. *Ephestia elutella*, 45. *Endrosis sarcitrella*, 46. *Hoffmannophila pseudospretella*, 50. *Monopis rusticella*, 51. *Niditinea fuscipunctella*, and 52. *Tineola bisselliella*) thus are introduced synanthropes living in human dwelling, not fit for existence in the open. Although *Monopis rusticella* is often breeding in birds' nests, this species is generally, unlike the closely allied *Monopis weaverella* SCOTT, found in or near houses. The four Greenland specimens of *M. rusticella* known have all been found indoors, but this species may in future become a resident.

Of the remaining 44 species three (20. *Autographa gamma*, 33. *Nomophila noctuella*, and 48. *Plutella maculipennis*) belong to the group of notorious immigrants and at least the two first-mentioned are unable to hibernate in Greenland.

The above elimination thus reduces the total number of native species to 41.

Distribution in Greenland

Considering only species which have been recorded from a representative number of localities, the maps (p. 54–63) indicate four dominating types of local distribution.

(1) Universally distributed species occurring either along all Greenland coasts (1. *Clossiana chariclea*, 24. *Entephria polata*) or unknown only from the east coast south of about 68°–69° (e. g. 5. *Colias hecla*, 16. *Sympistis zetterstedtii*, 21. *Gynaephora groenlandica*, 34. *Udea torvalis*).

(2) Species occurring along the coasts of the west as well as the east, but not reaching farther north than about 74° (e. g. 11. *Eumichtis sommeri*, 12. *Apamea exulis*, 19. *Syngrapha u aureum*, 32. *Scoparona centuriella*).

(3) Western species either restricted to the west coast from about 73° southwards (e. g. 8. *Caradrina quadrangula*, 14. *Lasiestra leucocycla*, 18. *Syngrapha borea*, 26. *Eupithecia sobrinata*, 40. *Epinotia indecorana*)

or additionally occurring in the southernmost part of East Greenland south of about 62° (e. g. 9. *Eurois occulta*, 10. *Spaelotis clandestina*).

(4) Northeastern species not found in West Greenland, but occurring from about 76° in the northwest along the north coast and following the northeast coast southwards until about 70° (e. g. 2. *Clossiana polaris*, 4. *Plebeius glandon*, 35. *Stenoptilia islandica*, 39. *Olethreutes mengelana*). Although once recorded from northernmost West Greenland (at 72°45′) even 23. *Psychophora sabinii* falls most naturally within this category.

The word "coast" used above is not to be taken literally, the coastal regions often being so broad that considerable climatic differences exist between areas close to the sea and those near the ice-cap. The climate of the latter is generally very dry, and the summer days are warm and sunny. The most fertile vegetation is not to be found on the coasts, but along the interior of the—often very long—fjords. Many of the localities plotted on the maps are situated far from the coasts, or, if in mountains, high above sea level.

In former times Greenland appeared on the maps divided into only two parts, the west and the east, as shown on the map (p. 64 fig. 51). The same division into "western" and "eastern" species was also taken into account in faunal discussions. As appears from the grouping above, such a division is however, most unnatural, if applied to the Lepidoptera.

The distribution of the northeastern species is more or less unbroken between Dundas in the west and d'Aunay Bugt in the east, and is by no means separated by the peninsula Nordostrundingen. A division suitable for the Lepidoptera is indicated on the map (p. 64 fig. 52). A comparison between this map and that shown on p. 53 fig. 10, indicating the present division of the area into three parts, the west, the north, and the east, demonstrates that—although the border-line between North and East Greenland, from a zootopographical point of view, is of no value—the boundary between North and West Greenland, based upon the intersection between the coast line and the 75° parallel, seems quite natural.

Distribution outside Greenland

The fact that Greenland pushes downwards like a wedge between the nearctic and the palaearctic faunas makes a zoogeographical analysis important, especially as regards establishing which components have to be termed nearctic and which palaearctic.

In his book on the faunal connections between North America and Europe Lindroth (1957) gives a most useful survey of all species com-

mon to these continents within certain animal groups. His list of Lepidoptera is, however, confined to the so-called "Macrolepidoptera".

Concerning the fauna of Greenland LINDROTH in this book (1957: 256) states that the terrestrial fauna (judging from the following groups of animals: Aves, Macrolepidoptera, Coleoptera, Collembola, and Araneae) "consists of one half Holarctic, and one fourth each of Nearctic and Palaearctic forms." He concludes (*loc. cit.*: "though it should of course be admitted that Greenland is a zoogeographical transition between the Palaearctic and Nearctic regions, this island—if a choice is necessary—must be regarded as Palaearctic . . . . . ."

Referring to the information regarding the distribution of each species given above in the Synopsis of the Species the 41 indigenous Greenland species treated in this paper may very roughly be grouped as follows:

(A) Nearctic species having their eastern limit of distribution in Greenland. This group comprises 12 species: 7. *Euxoa westermanni*, 10. *Spaelotis clandestina*, 14. *Lasiestra leucocycla*, 18. *Syngrapha borea*, 19. *Syngrapha u aureum*, 21. *Gynaephora groenlandica*, 22. *Operophtera bruceata*, 25. *Eupithecia gelidata*, 27. *Tehama bonifatella*, 34. *Udea torvalis*, 38. *Argyroploce inquietana*, 39. *Olethreutes mengelana*.

A. inquietana is included in spite of its occurrence in Kamchatka. Two species, *S. clandestina*, and *E. gelidata*, may prove to be conspecific with their allies in Europe, *S. suecia*, and *E. hyperboreata*, respectively. If so, they have to be referred to Group (F).

A typical example of a widely distributed nearctic species, *Tehama bonifatella*, which has reached Greenland, is shown on the map p. 64 (fig. 53). Even *Operophtera bruceata* has a somewhat similar distribution. These species probably belong to the arid nearctic immigration element which according to BRÆNDEGAARD (1946: 97–102, 127) has migrated into Greenland towards the Davis Strait.

(B) Nearctic species extending farther east than Greenland but not reaching the mainland of Europe. Two species: 8. *Caradrina quadrangula*, inhabiting Iceland, but not reaching farther east, and 12. *Apamea exulis*, extending down to the northernmost parts of the British Isles and eastwards to Spitzbergen, although not inhabiting the Scandinavian peninsula, may belong here. The latter species is traditionally regarded as a striking example of a moth of American origin which *via* Greenland has proceeded eastwards on its air-borne advance (LINDROTH 1957:243). Its extremely close relationship to the boreo-alpine species *A. maillardi* (mentioned above p. 20) occurring partly in the mountains of Central Europe (the Pyrenees, the Alps, Hungary) partly in mountain parts of

the Scandinavian peninsula seems, however, to weaken this supposition (see Group (F)).

(C) "Endemic" species. The following 5 species so far have not been recorded outside Greenland: 6. *Chorizagrotis drewseni*, 36. *Acleris boreana*, 37. *Acleris caryosphena*, 43. *Phthorimaea vibei*, 44. *Agonopteryx victori*. This fact does not, however, mean that Greenland actually has true endemic Lepidoptera. I fully agree with the statement of LINDROTH (1957: 256) according to which the apparently endemic Greenland Arthropods probably are all to be counted as nearctic.

(D) "Amphiatlantic" species occurring as well in Eastern North America as in Northern Europe but absent from Asia (apart possibly from Novaya Zemlya). Two species must be included in this group: 15. *Sympistis lapponica*, and 17. *Syngrapha parilis*.

(E) Palaearctic species having their western limit of distribution in Greenland. 5 species: 35. *Stenoptilia islandica*, 40. *Epinotia indecorana*, 42. *Phthorimaea valesiella*, 47. *Plutella senilella*, and 49. *Scythris noricella* belong to this group. The map p. 64 (fig. 54) shows the distribution of two characteristic species: *Stenoptilia islandica*, and *Epinotia indecorana*. *S. islandica* seems in Greenland to be restricted to the arid districts in the east and the north in agreement with its occurrence in Iceland, where this species prefers almost completely sterile lava-biotopes.

(F) Palaearctic species reaching farther west than Greenland. One species, 11. *Eumichtis sommeri*, may be referred to this group. Although generally regarded as forming part of the poor share of the nearctic element in the fauna of the North Atlantic islands (LINDROTH 1957: 253–255) its extremely close affinity to *Eumichtis adusta* Esp., a decidedly palaearctic species occurring in a number of "subspecific" populations within its wide range of distribution through Asia and Europe, does not seem to confirm this statement. As mentioned above even *Apamea exulis* may prove to belong to Group (F) rather than to Group (B).

(G) Holarctic or circumpolar species. This group contains the remaining 14 species: 1. *Clossiana chariclea*, 2. *Clossiana polaris*, 3. *Lycaena phlaeas*, 4. *Plebeius glandon*, 5. *Colias hecla*, 9. *Eurois occulta*, 13. *Hadena richardsoni*, 16. *Sympistis zetterstedtii*, 23. *Psychophora sabinii*, 24. *Entephria polata*, 26. *Eupithecia sobrinata*, 31. *Pyla fusca*, 32. *Scoparona centuriella*, 41. *Bryotropha similis*. Should the distinction between the American and the palaearctic "*Lycaena phlaeas*" prove to be justified, the Greenland species will have to be referred to Group (A).

The grouping above, which like any zoogeographical grouping, may be subject to slight alterations concurrently with increasing knowledge

of the true distribution of the species in question shows that the indigenous Greenland Lepidoptera count 15 per cent. palaearctic, 39 per cent. holarctic or circumpolar, and no less than 46 per cent. nearctic species. The present revision has shown that the nearctic element thus is highly predominant, and that the fauna, as far as the Lepidoptera concerns, by no means can be termed palaearctic.

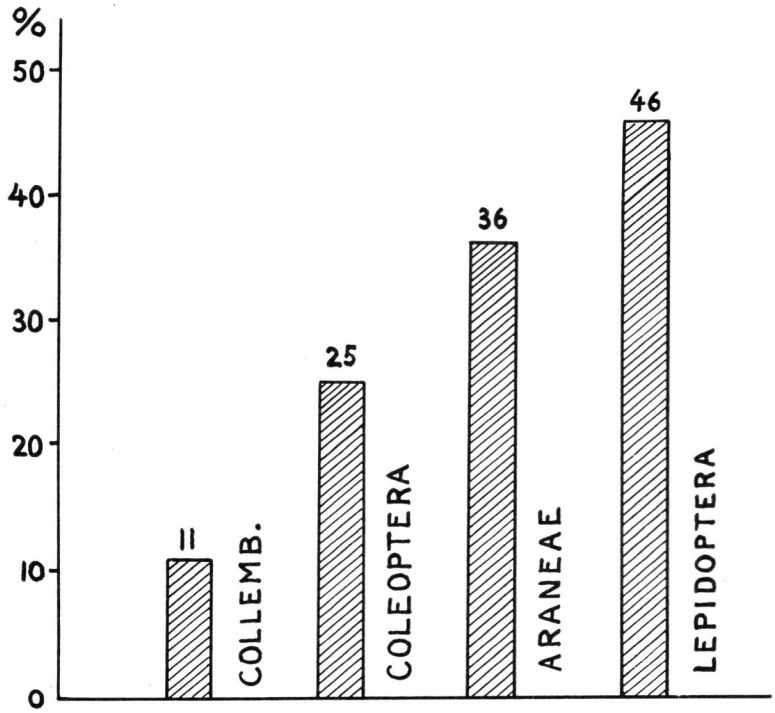

Fig. 55. Nearctic components within certain Greenland arthropod orders.

This is not the case with all arthropod orders. The share of the nearctic faunal element within certain other Greenland arthropods is shown in text fig. 55. The figures recorded are, apart from those referring to the Lepidoptera, in accordance with LINDROTH (1957: 256).

As will be seen, the nearctic share, being low in Collembola (11 per cent.), increases step by step within Coleoptera (25 per cent.) and Araneae (36 per cent.), reaching its maximum (46 per cent.) within the Lepidoptera.

Such a difference can hardly be accidental, but must have some relation to the different powers of dispersal within various arthropod orders. The collemboles are strictly earth-bound, while many beetles are active fliers. Concerning the spiders BRÆNDEGAARD (1946: 125) states the wind to be the most important factor with relation to the immigration

of the Greenland spiders. Nearly all Lepidoptera are now and then on the wing. Even small species without any powers of active flight (as e. g. *Plutella maculipennis* CURT.) have proved to be suited for aerial transport over considerable distances. And even apterous females (as e. g. *Operophtera brumata* L.) have been observed to be capable of being transported through the air when carried by the male during their copulation.

The figures shown in text fig. 55 are expressive of the increasing ability of being air-born within the orders in question, and therefore seem to emphasize that the utmost importance has to be attached to dispersal through the air as a means of enabling the nearctic faunal element to have migrated into Greenland.

CORRECTION

In the reproduction of Plates I, II, and IV the specimens – stated to be pictured in full size – appear slightly reduced.

The remaining illustrations are to scale.

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Færdig fra trykkeriet den 30. oktober 1964.

PLATES

Plate I

Fig. 1: *Clossiana chariclea* SCHN. ♂ (×1). West Greenland, Sarqaq. 4.VII.1949. CHR. VIBE leg.

Fig. 2: *Clossiana chariclea* SCHN. ♀ (×1). North Greenland, Dundas. 26.VII.1951. CHR. VIBE leg.

Fig. 3: *Clossiana chariclea* SCHN. underside (×1). East Greenland, Hekla Havn. 19.VII.1892. H. DEICHMANN leg.

Fig. 4: *Clossiana polaris* BDV. ♂ (×1). East Greenland, Danmarks Havn. 24.VII. 1919. H. L. JENSEN leg.

Fig. 5: *Clossiana polaris* BDV. ♀ (×1). East Greenland, Scoresbysund. 16.VII.1925. ALWIN PETERSEN leg.

Fig. 6: *Clossiana polaris* BDV. underside (×1). East Greenland, Hvalrosodden. 25–28.VII.1939. ALWIN PETERSEN leg.

Fig. 7: *Lycaena phlaeas* L. ♀ (×1). North Greenland, Qânâq, MacCormick Fjord. 26.VIII.1941. CHR. VIBE leg.

Fig. 8: *Plebeius glandon* PRUNN. ♂ (×1). North Greenland, Dundas. 27.VII.1951. CHR. VIBE leg.

Fig. 9: *Plebeius glandon* PRUNN. ♀ (×1). North Greenland, Dundas. 6.VIII.1952. CHR. VIBE leg.

Fig. 10: *Plebeius glandon* PRUNN. underside (×1). Same specimen as shown in fig. 9.

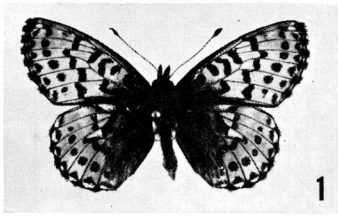
Fig. 11: *Colias hecla* LEF. ♂ (×1). West Greenland, Grønnedal. 5.VII.1950. CHR. VIBE leg.

Fig. 12: *Colias hecla* LEF. ♀ (×1). West Greenland, Grønnedal. 14.VIII.1955. T. FEDDERSEN leg.

Fig. 13: *Colias hecla* LEF. ♀ (×1). East Greenland, Zackenberg Bugt. 27.VII.1947. PALLE JOHNSEN leg.

Fig. 14: *Gynaephora groenlandica* WOCKE ♂ (×1). West Greenland, Sarqaq. 29.VI. 1949. CHR. VIBE leg.

Fig. 15: *Gynaephora groenlandica* WOCKE ♀ (×1). East Greenland, Liverpool Land. 30.VI.1928. ALWIN PETERSEN leg.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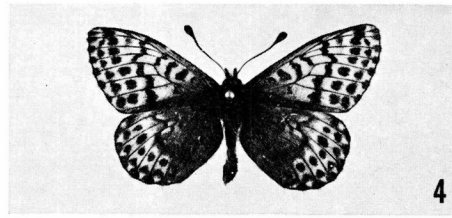
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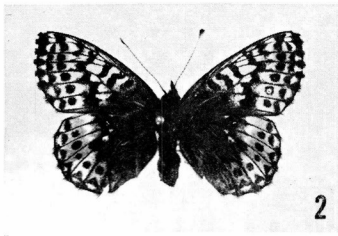
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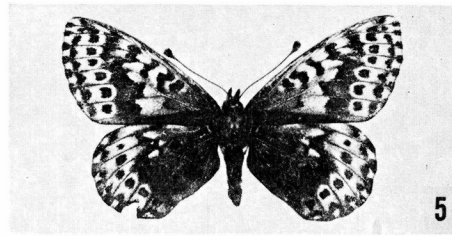
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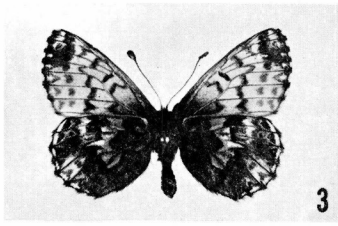
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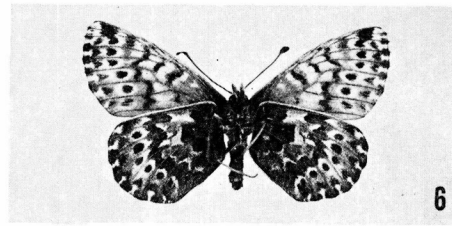
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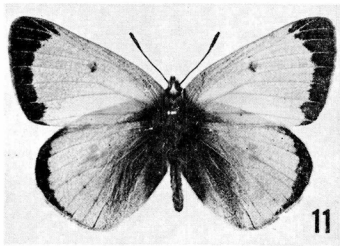
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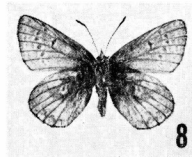
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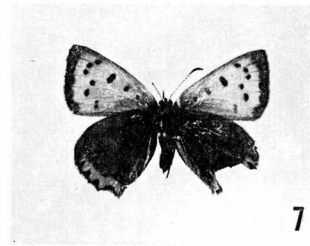
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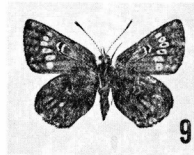
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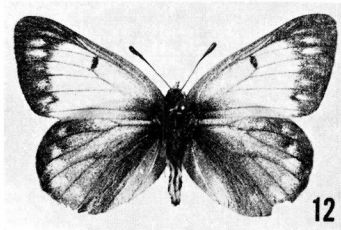
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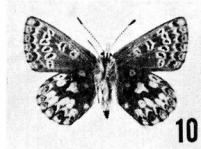
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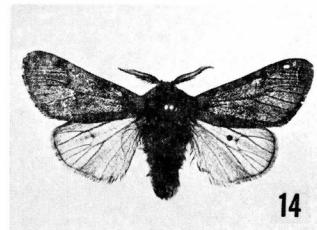
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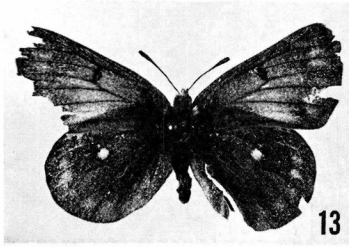
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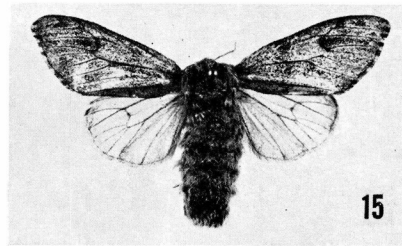
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Plate II

Fig. 1: *Chorizagrotis drewseni* STAUD. Holotype (×1). West Greenland, without exact statement of locality.

Fig. 2: *Chorizagrotis drewseni* STAUD. (×1). East Greenland, Mesters Vig. 2.VII.1955. HÁLFDAN BJÖRNSSON leg.

Fig. 3: *Chorizagrotis drewseni* STAUD. (×1). West Greenland, Kapisigdlit. 19.VII. 1950. CHR. VIBE leg.

Fig. 4: *Euxoa westermanni* STAUD. Holotype (×1). West Greenland, without exact statement of locality.

Fig. 5: *Caradrina quadrangula* ZETT. (×1). West Greenland, Julianehåb 30.VI.1900 (bred). MELDORF leg.

Fig. 6: *Eurois occulta* L. (×1). West Greenland, Grønnedal. 17.VII.1955. T. FEDDERSEN leg.

Fig. 7: *Eurois occulta* L. (×1). West Greenland, Grønnedal. 15.VII.1955. T. FEDDERSEN leg.

Fig. 8: *Eurois occulta* L. (×1). West Greenland, Grønnedal. 15.VII.1955. T. FEDDERSEN leg.

Fig. 9: *Spaelotis clandestina* HARR. (×1). West Greenland, Arsuk. 16.VIII.1955. T. FEDDERSEN leg.

Fig. 10: *Eumichtis sommeri* LEF. (×1). West Greenland, Grønnedal. 5.VI.1955. T. FEDDERSEN leg.

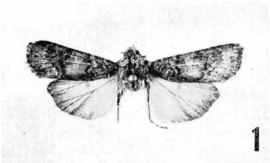
Fig. 11: *Eumichtis sommeri* LEF. (×1). West Greenland, Grønnedal. 26.VIII.1955. T. FEDDERSEN leg.

Fig. 12: *Apamea exulis* LEF. (×1). West Greenland, Grønnedal. 11.VII.1955. T. FEDDERSEN leg.

Fig. 13: *Apamea exulis* LEF. (×1). West Greenland, Grønnedal. 27.VI.1955. T. FEDDERSEN leg.

Fig. 14: *Apamea exulis* LEF. (×1). West Greenland, Sukkertoppen. Medio VII.1950. CHR. VIBE leg.

Fig. 15: *Hadena richardsoni* CURT. (×1). West Greenland, Sarqaq. 13.VII.1949. CHR. VIBE leg.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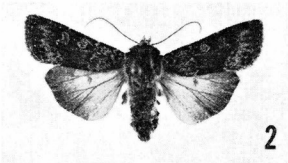
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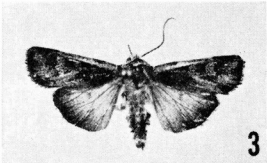
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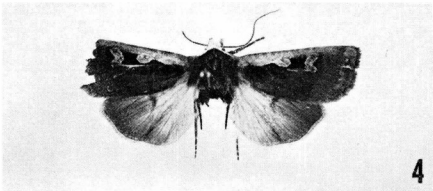
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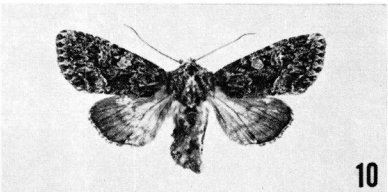
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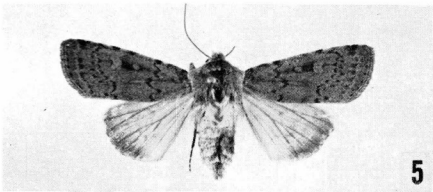
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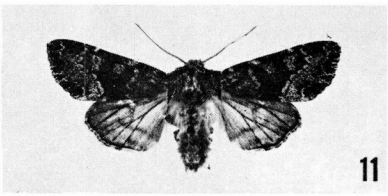
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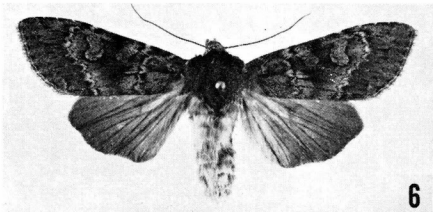
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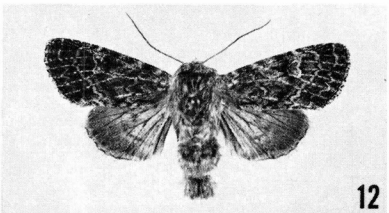
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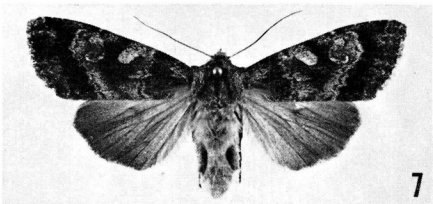
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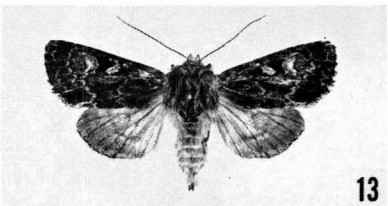
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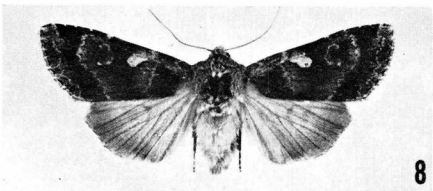
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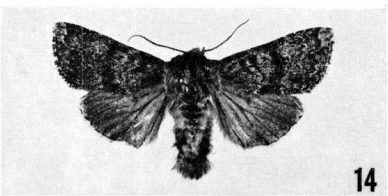
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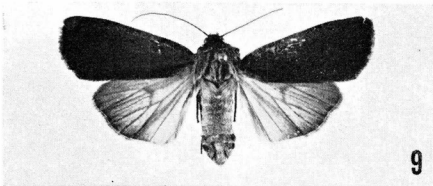
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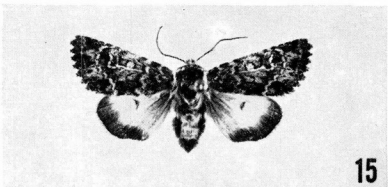
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Plate III

All specimens pictured in this plate were found dead indoors ult. VIII.1962, West Greenland, Narssarssuaq. NIELS L. WOLFF leg.

Fig. 1: *Euxoa westermanni* STAUD. (×1).

Fig. 2: *Spaelotis clandestina* HARR. (×1).

Fig. 3: *Eurois occulta* L. Black variety. (×1)

Fig. 4: *Eumichtis sommeri* LEF. Extremely light-coloured variety. (×1).

Fig. 5: *Apamea exulis* LEF. Dark variety. (×1).

Fig. 6: *Apamea exulis* LEF. Light-coloured variety. (×1).

Figs. 7–15: *Chorizagrotis drewseni* STAUD. (×2).

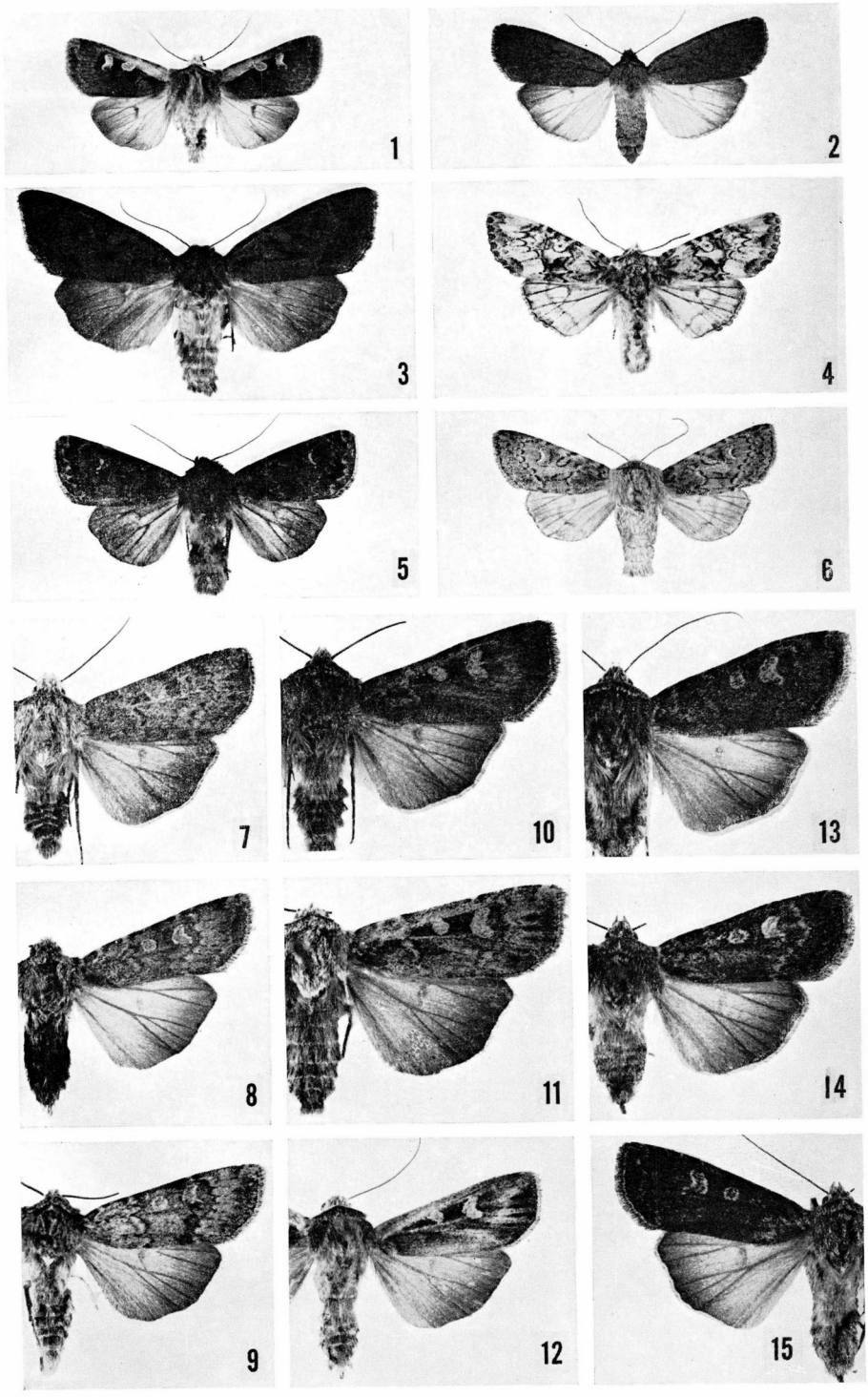
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Plate IV

Fig. 1: *Lasiestra leucocycla* STAUD. (×1). West Greenland, Sarqaq. ex. p. 25.VI.1949. CHR. VIBE leg.

Fig. 2: *Sympistis lapponica* THNBG. (×1). West Greenland, Sarqaq. 8.VII.1949. CHR. VIBE leg.

Fig. 3: *Sympistis zetterstedtii* STAUD. (×1). West Greenland, Marrait, Nûgssuaq. 17.VII.1949. CHR. VIBE leg.

Fig. 4: *Syngrapha parilis* HB. (×1). East Greenland, Jamesons Land. 3.VIII.1891. DEICHMANN leg.

Fig. 5: *Syngrapha borea* AURIV. (×1). West Greenland, Kûngnât. 13.VII.1954. T. ANDERSEN leg.

Fig. 6: *Autographa gamma* L. (×1). East Greenland, Angmagssalik. VII.1936. GITZ-JOHANSEN leg.

Fig. 7: *Syngrapha u aureum* GUEN. (×1). West Greenland, without exact statement of locality. Collected between 1828 and 1836. J. VAHL leg.

Fig. 8: *Syngrapha u aureum* GUEN. (×1). West Greenland, Tasiussaq. 24.VII.1889. W. LUNDBECK leg.

Fig. 9: *Syngrapha u aureum* GUEN. (×1). West Greenland, Julianehåb. 26.VII.1948. CHR. VIBE leg.

Fig. 10: *Operophtera bruceata* HULST ♂ (×1). West Greenland, Grønnedal. 15.X.1955. T. FEDDERSEN leg.

Fig. 11: *Operophtera bruceata* HULST ♂ (×1). West Greenland, Grønnedal. 15.X.1955. T. FEDDERSEN leg.

Fig. 12: *Operophtera bruceata* HULST ♀ (×1). West Greenland, Grønnedal. 15.X.1955.

Fig. 13: *Entephria polata* DUP. (×1). East Greenland, Hochstetters Forland. 20.VII. 1933. ALWIN PETERSEN leg.

Fig. 14: *Entephria polata* DUP. (×1). North Greenland, Dundas. 6.VII.1952. CHR. VIBE leg.

Fig. 15: *Entephria polata* DUP. (×1). East Greenland, Daneborg, Sandodden. 23.VII. 1947. PALLE JOHNSEN leg.

Fig. 16: *Psychophora sabinii* KIRBY (×1). East Greenland, Hold with hope. 1.VIII. 1921. A. EVERS leg.

Fig. 17: *Psychophora sabinii* KIRBY (×1). East Greenland, Hvalrosodden. 25–28.VII. 1939. ALWIN PETERSEN leg.

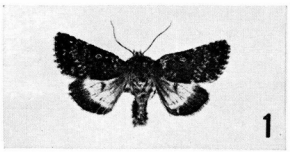
Fig. 18: *Pyla fusca* HAW. (×1). East Greenland, Zackenberg Bugt. 15.VIII.1949. PALLE JOHNSEN leg.

Fig. 19: *Nomophila noctuella* DEN. & SCHIFF. (×1). West Greenland, Kûngnât. 8.VII.1954. T. ANDERSEN leg.

Fig. 20: *Scoparona centuriella* DEN. & SCHIFF. ♂ (×1). West Greenland, Søndre Strømfjord. 29.VII.1952. CHR. VIBE leg.

Fig. 21: *Scoparona centuriella* DEN. & SCHIFF. ♀ (×1). West Greenland, Marrait, Nûgssuaq. 17.VII.1949. CHR. VIBE leg.

Fig. 22: *Udea torvalis* MÖSCHL. (×1). West Greenland, Sarqaq. 27.VI.1949. CHR. VIBE leg.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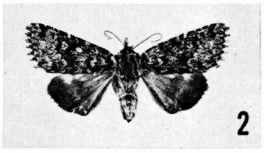
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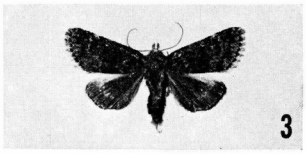
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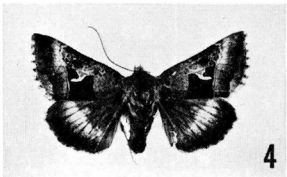
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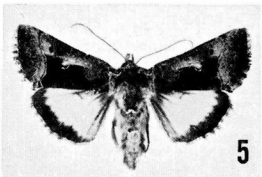
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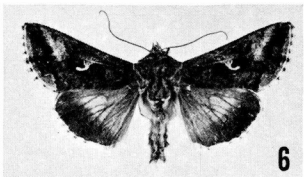
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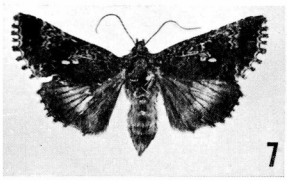
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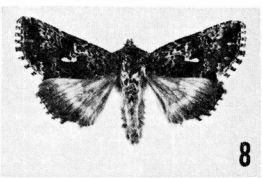
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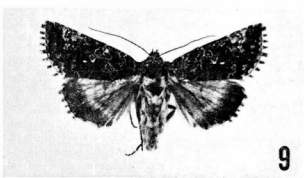
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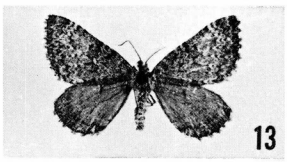
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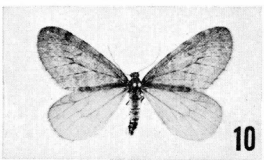
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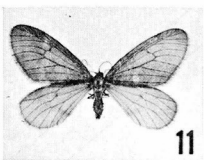
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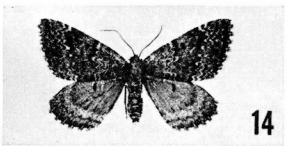
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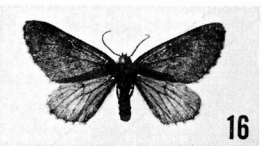
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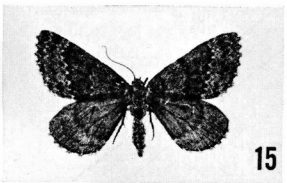
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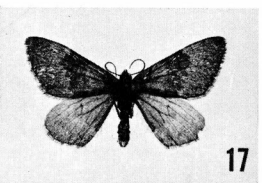
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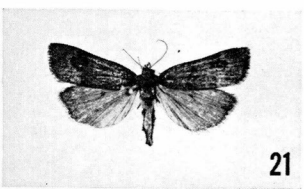
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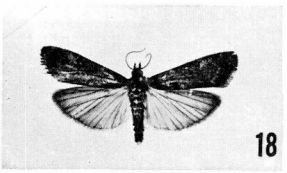
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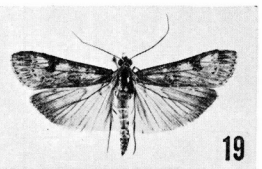
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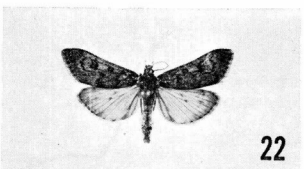
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Plate V

Fig. 1: *Eupithecia gelidata* Möschl. (×2). West Greenland, Godhavn, Disko. Bred from larva feeding 19.VIII.1962 on *Salix glauca*. Niels L. Wolff leg.

Fig. 2: *Eupithecia gelidata* Möschl. (×2). East Greenland, Mesters Vig 22.VI.1955. Hálfdan Björnsson leg.

Fig. 3: *Eupithecia gelidata* Möschl. (×2). West Greenland, Ivigtut 10.VI.1948. P. Graff-Petersen leg.

Fig. 4: *Eupithecia sobrinata* Hb. (×2). West Greenland, Grønnedal 27.VIII.1955. T. Feddersen leg.

Fig. 5: *Eupithecia sobrinata* Hb. (×2). West Greenland, Igaliko Fjord 28.VIII.1889. W. Lundbeck leg.

Fig. 6: *Tehama bonifatella* Hulst. (×2). West Greenland, Kapisigdlit. 14.VII.1950. Chr. Vibe leg.

Fig. 7: *Stenoptilia islandica* Staud. (×2). East Greenland, Gåseland 7.–12.VII. 1892. Deichmann leg.

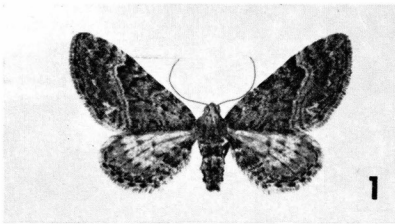
Fig. 8: *Acleris boreana* n. sp. Paratype (×2). West Greenland, Narssarssuaq 1.IX. 1962. Niels L. Wolff leg.

Fig. 9: *Acleris boreana* n. sp. Paratype (×2). West Greenland, Søndre Strømfjord 11.VIII.1962. Niels L. Wolff leg.

Fig. 10: *Acleris boreana* n. sp. Paratype (×2). West Greenland, Ivigtut 3.VI.1949 (hibernated specimen). Chr. Vibe leg.

Fig. 11: *Acleris caryosphena* Meyr. (×2). West Greenland, Narssarssuaq 2.IX.1962. Niels L. Wolff leg.

Fig. 12: *Acleris caryosphena* Meyr. (×2). West Greenland, Søndre Strømfjord 11.VIII. 1962. Niels L. Wolff leg.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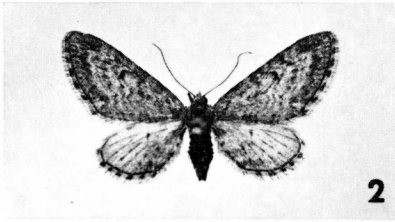
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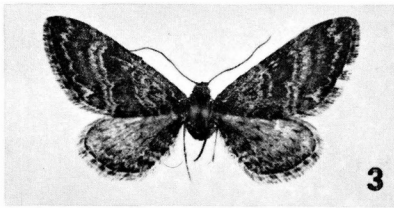
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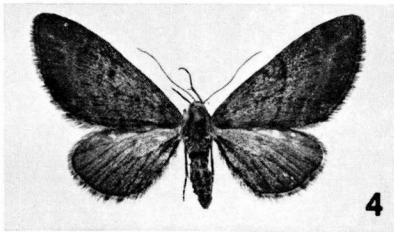
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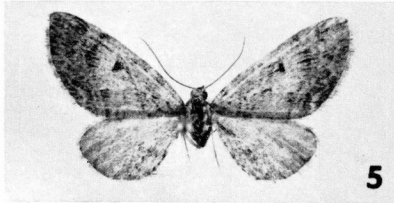
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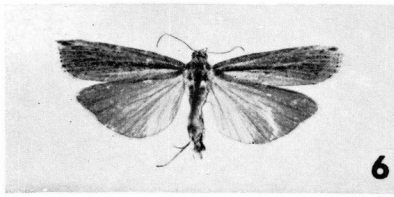
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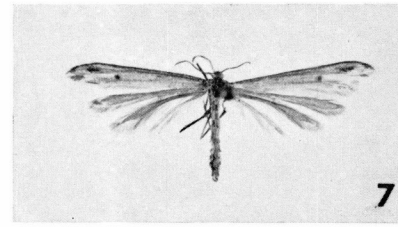
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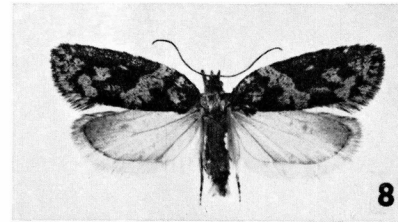
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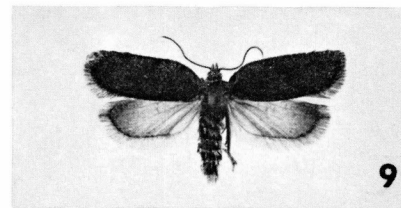
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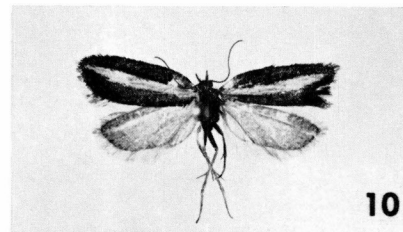
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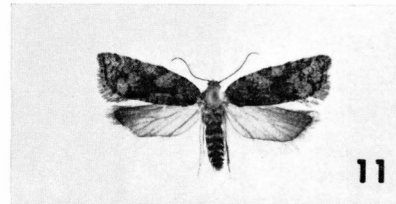
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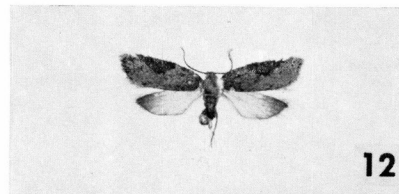
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Plate VI

Fig. 1: *Argyroploce inquietana* Wlk. ♂ (×2). North Greenland, Dundas. 27.VII.1951. Chr. Vibe leg.

Fig. 2: *Argyroploce inquietana* Wlk. ♀ (×2). East Greenland, Mesters Vig. 16.VI. 1955. Hálfdan Björnsson leg.

Fig. 3: *Olethreutes mengelana* Fern. (×2). North Greenland, Inglefield Land. 26.VI. 1941. Chr. Vibe leg.

Fig. 4: *Olethreutes mengelana* Fern. (×2). North Greenland, North Heilprin Land 8.VII.1949. Palle Johnsen leg.

Fig. 5: *Epinotia indecorana* Zett. ♂ (×2). West Greenland, Narssarssuaq. 2.IX.1962. Niels L. Wolff leg.

Fig. 6: *Epinotia indecorana* Zett. ♀ (×2). West Greenland, Søndre Strømfjord. 11.VIII.1962. Niels L. Wolff leg.

Fig. 7: *Bryotropha similis* Stt. (×2). West Greenland, Qagssiarssuk. 24.VI.–2.VII. 1962. B. Fredskild leg.

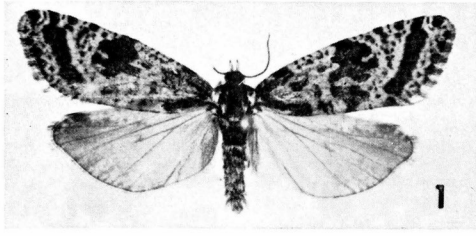
Fig. 8: *Phthorimaea valesiella* Staud. (×2). East Greenland, Mesters Vig. 8.VII.1955. Hálfdan Björnsson leg.

Fig. 9: *Agonopteryx victori* de Lesse & Viette (×2). West Greenland, Narssarssuaq. 19.V.1949 (hibernated specimen). Chr. Vibe leg.

Fig. 10: *Plutella senilella* Zett. (×2). West Greenland, Ivigtut. 10.VI.1948 (hibernated specimen). P. Graff-Petersen leg.

Fig. 11: *Plutella senilella* Zett. (×2). West Greenland, Narssarssuaq. 3.IX.1962. Niels L. Wolff leg.

Fig. 12: *Scythris noricella* Zell. (×2). West Greenland, Disko, Godhavn. 17.VIII. 1962. Niels L. Wolff leg.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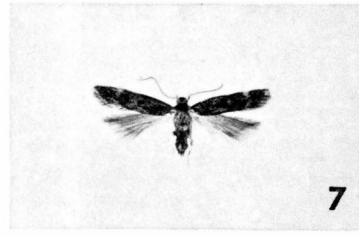
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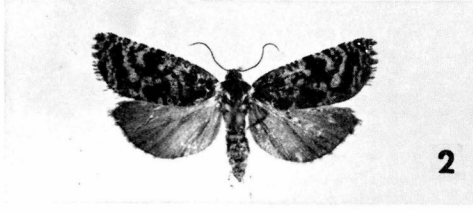
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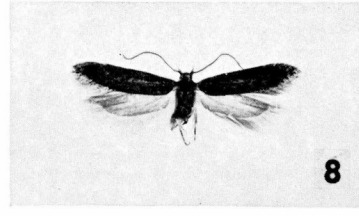
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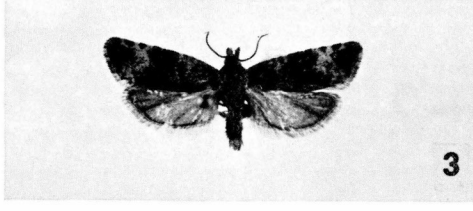
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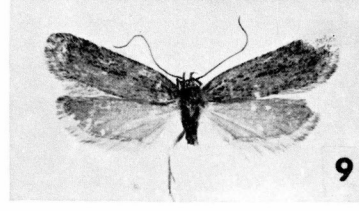
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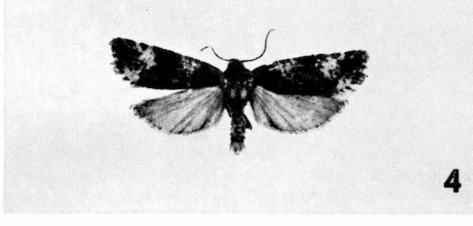
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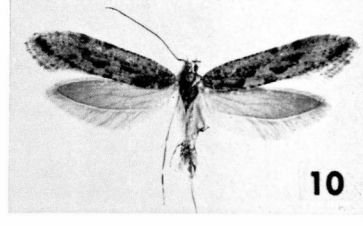
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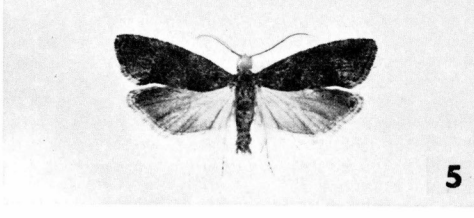
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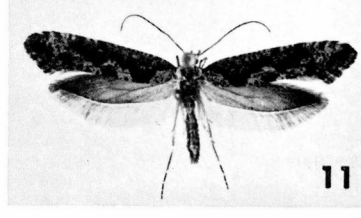
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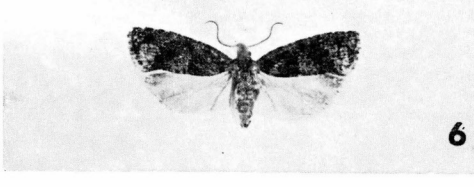
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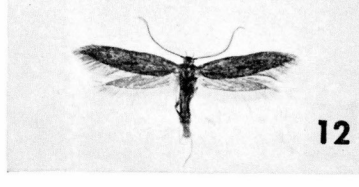
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Plate VII

Fig. 1: *Plebeius glandon* PRUNN. Male genitalia (×20). North Greenland, Neqe. 9.VIII.1941. CHR. VIBE leg. (prep. 2584).

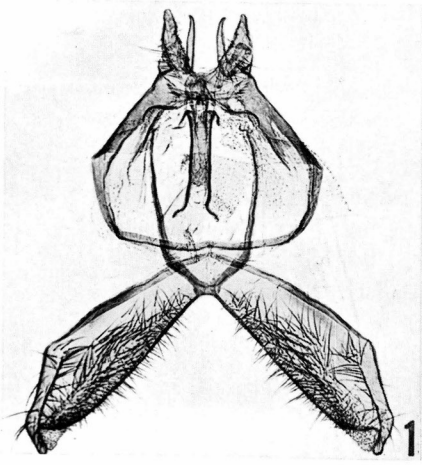
Fig. 2: *Euxoa westermanni* STAUD. Holotype. Remaining part of male genitalia (×15). West Greenland, without exact statement of locality. (prep. 2322).

Fig. 3: *Spaelotis clandestina* HARR. Male genitalia (×10). West Greenland, Kapisigdlit. 15.VIII.1950. CHR. VIBE leg. (prep. 2582).

Fig. 4: *Chorizagrotis drewseni* STAUD. Holotype. Remaining part of male genitalia (×15). West Greenland, without exact statement of locality. (prep. 1343a).

Fig. 5: *Chorizagrotis drewseni* STAUD. Male genitalia (×15). West Greenland, Kapisigdlit. 20.VII.1950. CHR. VIBE leg. (prep. 2546).

Fig. 6: *Caradrina quadrangula* ZETT. Male genitalia (×15). West Greenland, Ivigtut. 15.VIII.1948. P. GRAFF-PETERSEN leg. (prep. 1838).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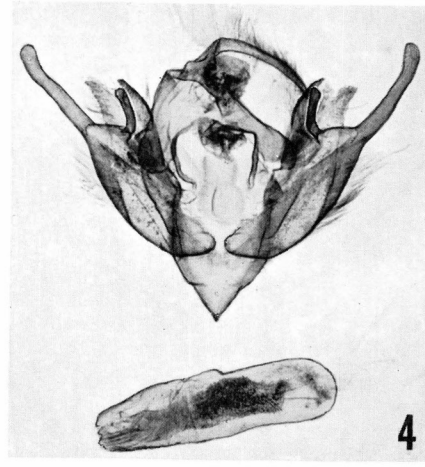
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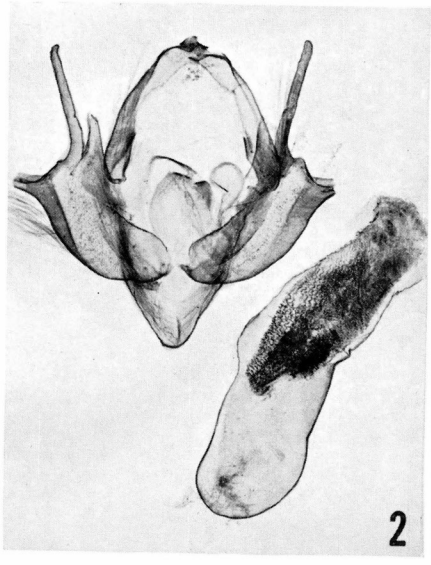
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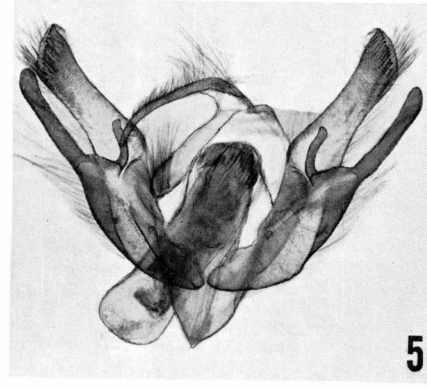
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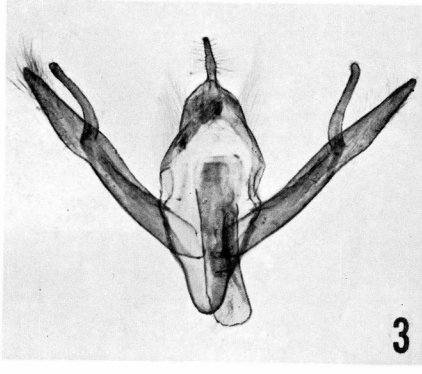
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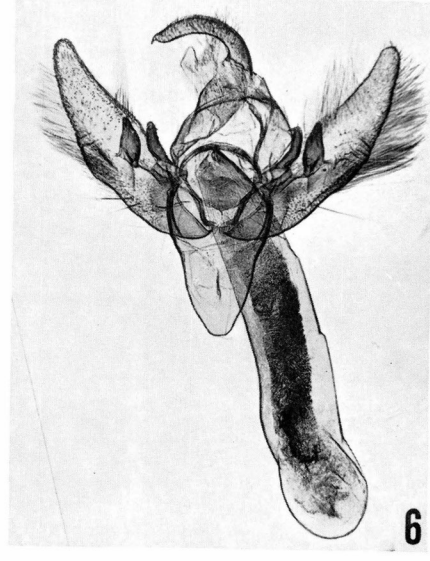
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Plate VIII

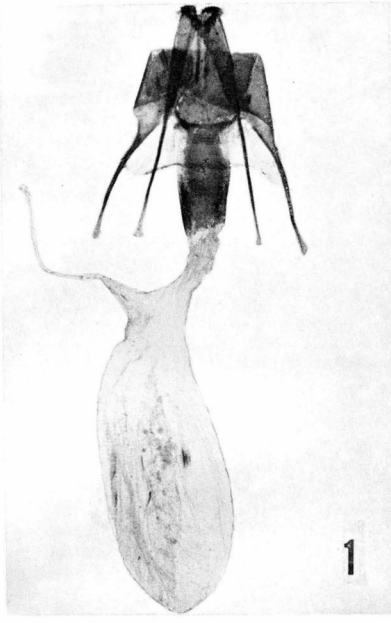
Fig. 1: *Spaelotis clandestina* HARR. Female genitalia (×10). West Greenland, Narssarssuaq. Found dead indoors ult. VIII.1962. NIELS L. WOLFF leg. (prep. 2833).

Fig. 2: *Spaelotis suecica* AURIV. Female genitalia (×10). Finland, Ik. Kallomäki. 23.VII.1943. P. BRUUN leg., coll. C.-G. WAHLSTRÖM. (prep. 2830). [Not found in Greenland, pictured for comparison].

Fig. 3: *Eumichtis sommeri* LEF. Male genitalia (×10). West Greenland, Narssarssuaq. Found dead indoors ult. VIII.1962. NIELS L. WOLFF leg. (prep. 2789).

Fig. 4: *Syngrapha borea* AURIV. Female genitalia (×10). West Greenland, Søndre Strømfjord 17.VII.1952. CHR. VIBE leg. (prep. 2824).

Fig. 5: *Syngrapha diasema* BDV. Female genitalia (×10). Finland, L.kem.Muonio 4.VII.1937. C.-G. WAHLSTRÖM leg. (prep. 2831). [Not found in Greenland, pictured for comparison].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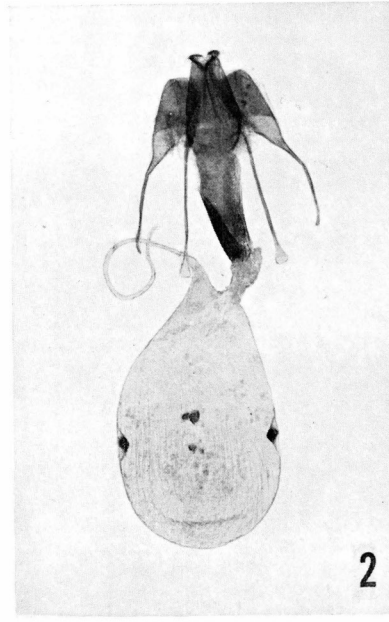
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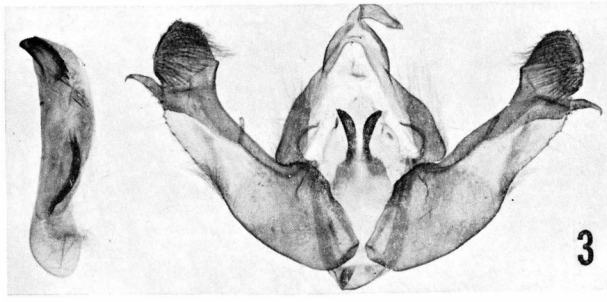
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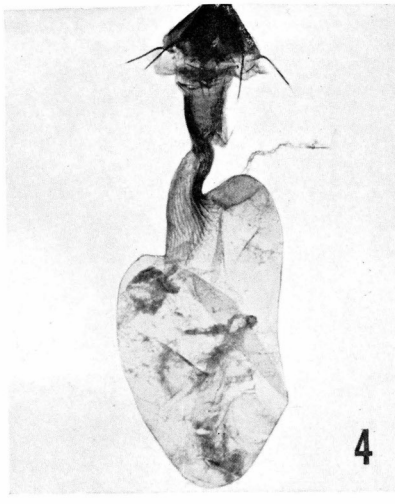
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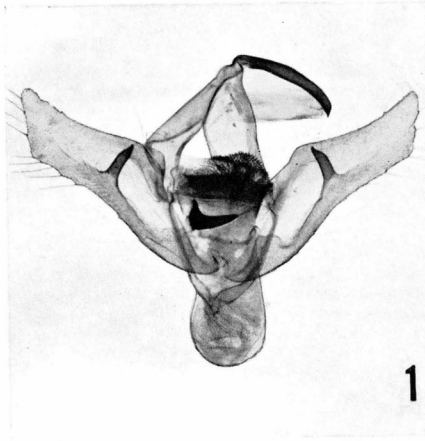
Plate IX

Fig. 1: *Syngrapha borea* AURIV. Male genitalia (×10). West Greenland, Kapisigdlit 21.VII.1950. CHR. VIBE leg. (prep. 2816).

Fig. 2: *Syngrapha microgamma* HB. Male genitalia (×10). Sweden, Vb. Sävar, Bullmark 22.VI.1960. INGVAR SVENSSON leg. (prep. 2846). [Not found in Greenland, pictured for comparison].

Fig. 3: *Syngrapha diasema* BDV. Male genitalia (×10). Sweden, Nb. Pajala 3.VII. 1960. INGVAR SVENSSON leg. (prep. 2818). [Not found in Greenland, pictured for comparison].

Fig. 4: *Gynaephora groenlandica* WOCKE. Male genitalia (×15). East Greenland, Ella Ø 3.VII.1934. SØGAARD ANDERSEN leg. (prep. 2813).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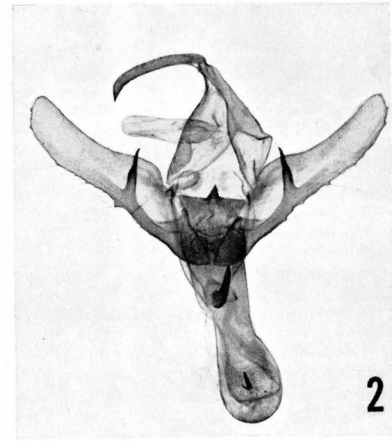
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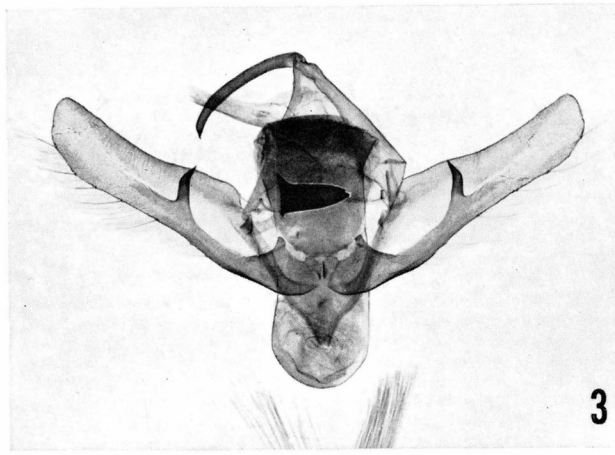
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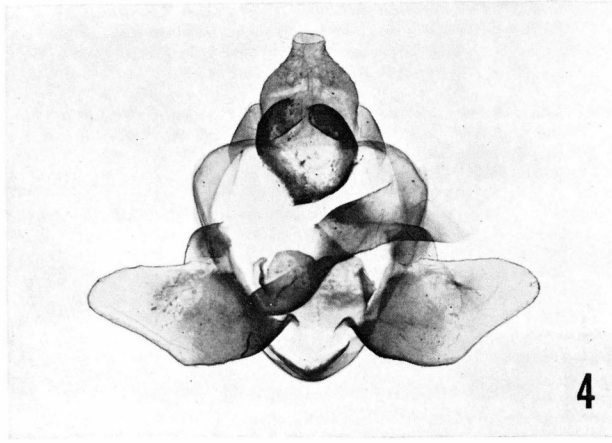
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Plate X

Fig. 1: *Eurois occulta* L. Male genitalia (×10). West Greenland, Julianehåb. 11.IX. 1889. W. Lundbeck leg. (prep. 2581).

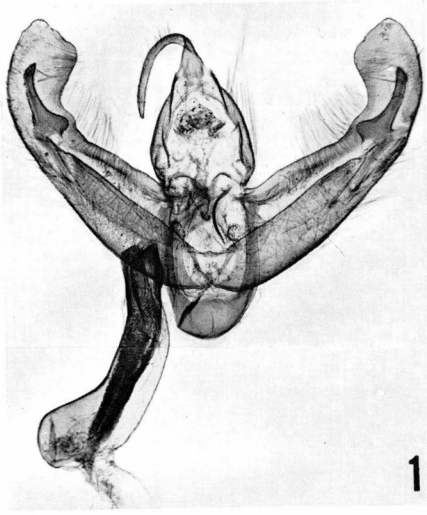
Fig. 2: *Syngrapha interrogationis* L. Male genitalia (×10). Denmark, Vang on Bornholm. 21–31.VII.1955. Niels L. Wolff leg. (prep. 2178). [Not found in Greenland, pictured for comparison].

Fig. 3: *Syngrapha interrogationis* L. Female genitalia (×15). Iceland, Þingvellir. 1856. O. Staudinger leg. (prep. 2177). [Not found in Greenland, pictured for comparison].

Fig. 4: *Apamea exulis* Lef. Male genitalia (×10). East Greenland, Kap Hope. 25–30. VIII.1928. Alwin Petersen leg. (prep. 2580).

Fig. 5: *Syngrapha u aureum* Guen. Male genitalia (×10). West Greenland, Kapisigdlit. 21.VII.1950. Chr. Vibe leg. (prep. 2176).

Fig. 6: *Syngrapha u aureum* Guen. Female genitalia (×15). West Greenland, Kapisigdlit. 19.VII.1950. Chr. Vibe leg. (prep. 2536).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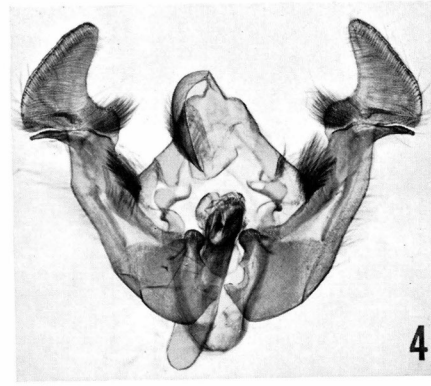
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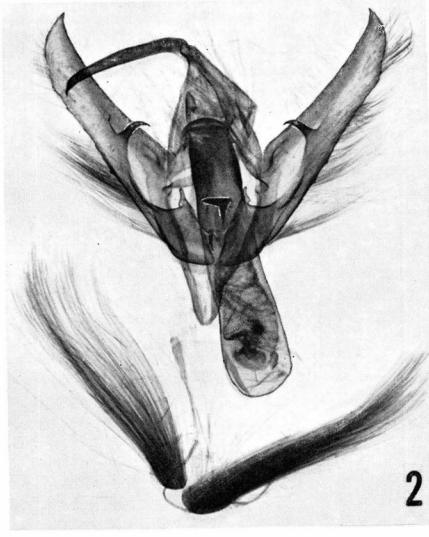
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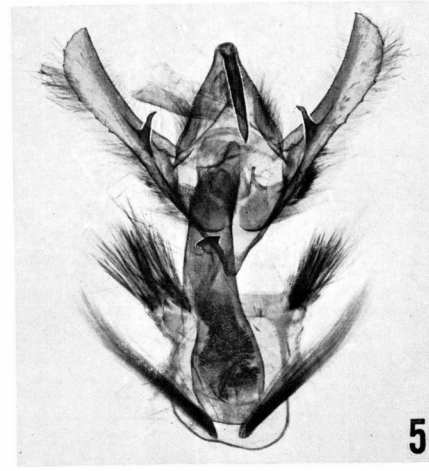
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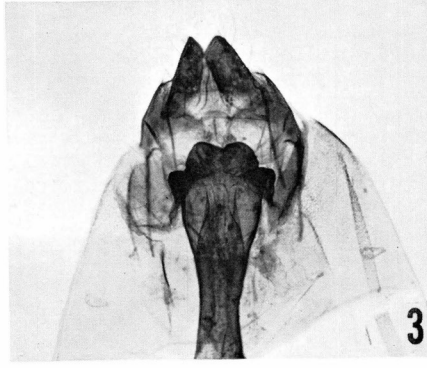
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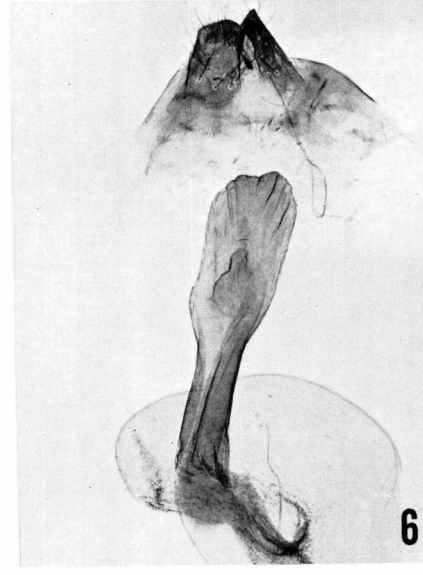
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Plate XI

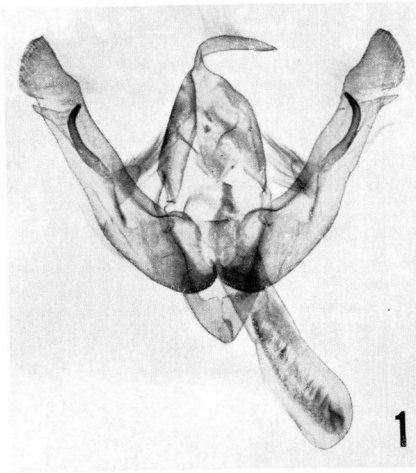
Fig. 1: *Lasiestra leucocycla* STAUD. Male genitalia (×20) of same specimen as shown in Plate IV, fig. 1. (prep. 2781).

Fig. 2: *Lasiestra staudingeri* AURIV. Male genitalia (×20). Sweden, Björkliden 1–7. VII.1962. TAGE JENSEN leg. (prep. 2780). [Not found in Greenland, pictured for comparison].

Fig. 3: *Sympistis zetterstedtii* STAUD. Male genitalia (×20). West Greenland, Nugssuaq, Marrait 17.VII.1949. CHR. VIBE leg. (prep. 2783).

Fig. 4: *Sympistis lapponica* THNBG. Male genitalia (×20). West Greenland, Sarqaq 16.VII.1949. CHR. VIBE leg. (prep. 2790).

Fig. 5: *Udea torvalis* MÖSCHL. Male genitalia (×25). West Greenland, Grønnedal 5.VII.1950. CHR. VIBE leg. (prep. 2828).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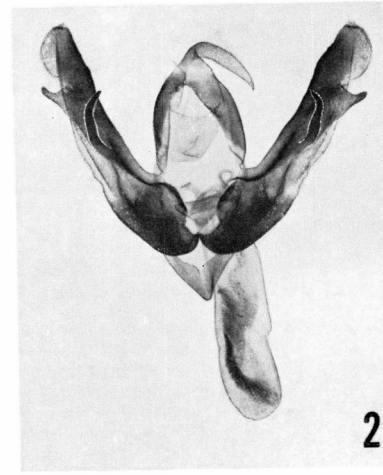
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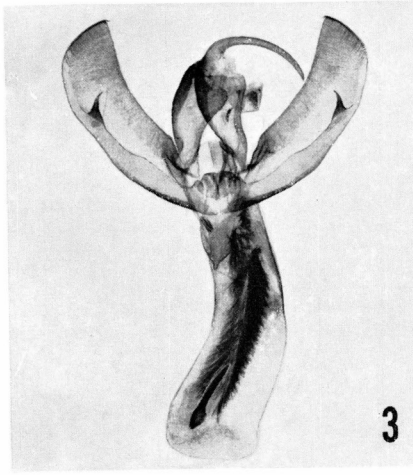
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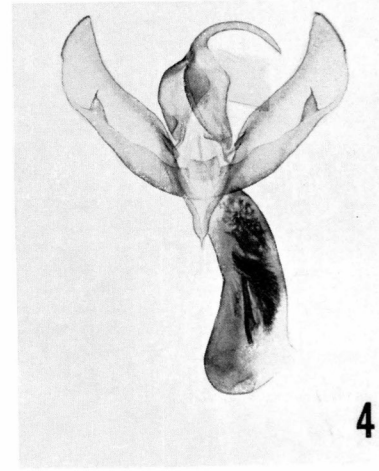
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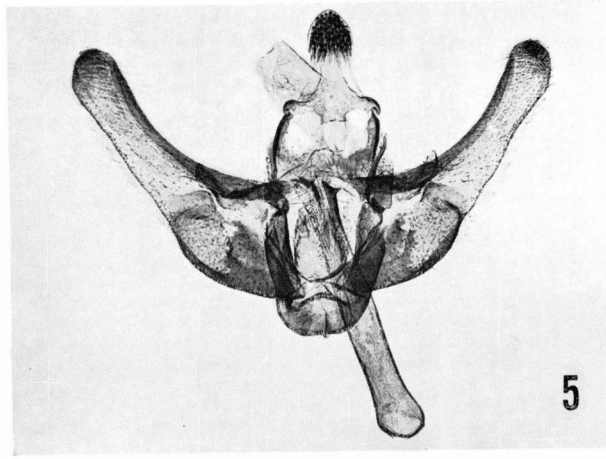
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Plate XII

Fig. 1: *Operophtera bruceata* HULST. Male genitalia (×20). West Greenland, Grønnedal 8.X.1955. T. FEDDERSEN leg. (prep. 2571).

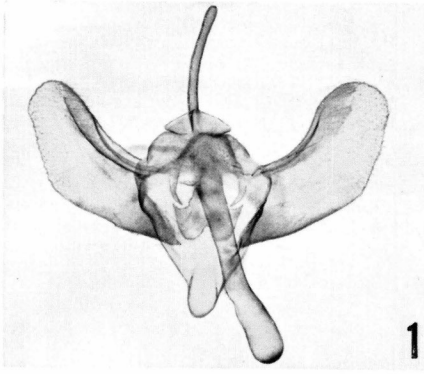
Fig. 2: *Operophtera bruceata* HULST. Female genitalia (×40). West Greenland, Grønnedal 8.X.1955. T. FEDDERSEN leg. (prep. 2573).

Fig. 3: *Operophtera brumata* L. Male genitalia (×20). Denmark, Skodsborg 2.XI.1931. NIELS L. WOLFF leg. (prep. 1920). [Not found in Greenland, pictured for comparison].

Fig. 4: *Operophtera brumata* L. Female genitalia (×40). Denmark, Charlottenlund 12.XI.1931. NIELS L. WOLFF leg. (prep. 1921). [Not found in Greenland, pictured for comparison].

Fig. 5: *Psychophora sabinii* KIRBY. Male genitalia (×20). East Greenland, Zackenberg Bugt 15.VIII.1949. PALLE JOHNSEN leg. (prep. 2544).

Fig. 6: *Entephria polata* DUP. Male genitalia (×20). East Greenland, Hochstetters Forland 20.VII.1933. ALWIN PETERSEN leg. (prep. 2547).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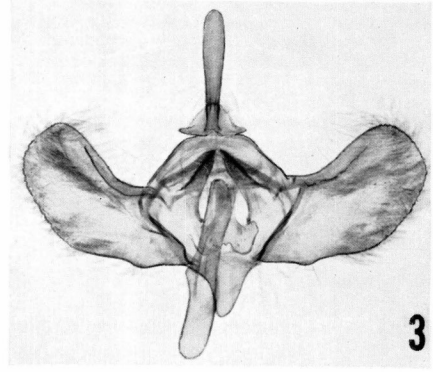
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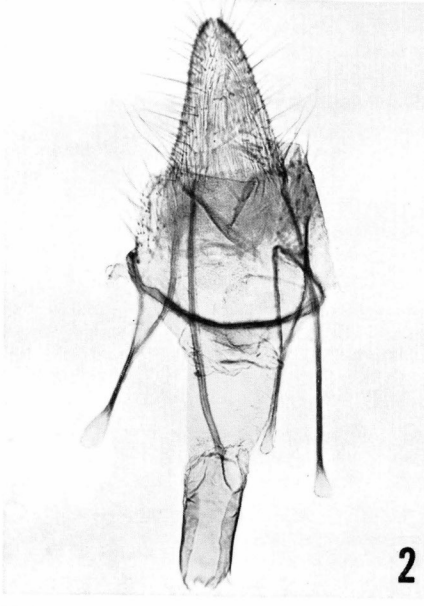
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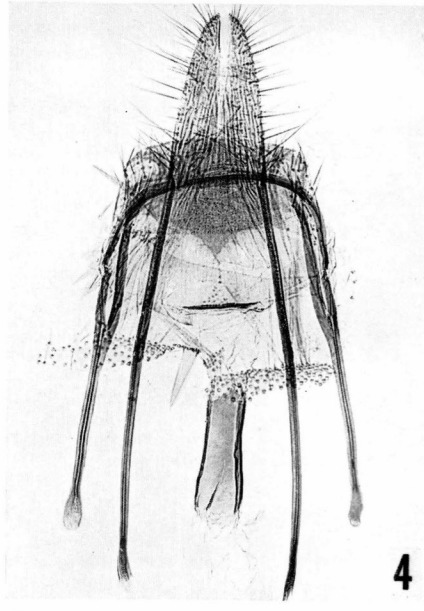
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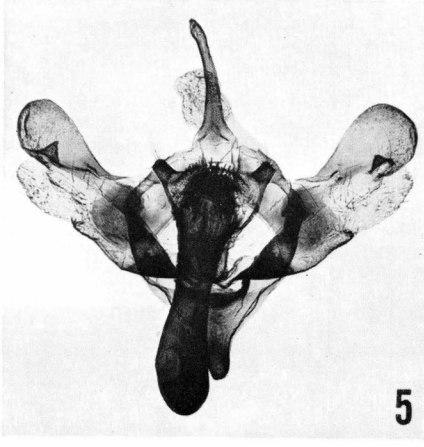
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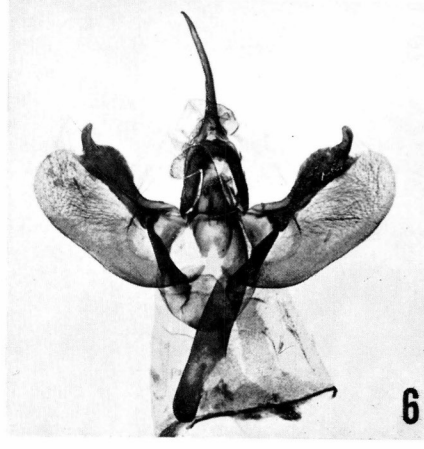
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Plate XIII

Fig. 1: *Eupithecia gelidata* Möschl. Male genitalia (×20). West Greenland, Laksefjord. 7.VII.1951. Chr. Vibe leg. (prep. 2575).

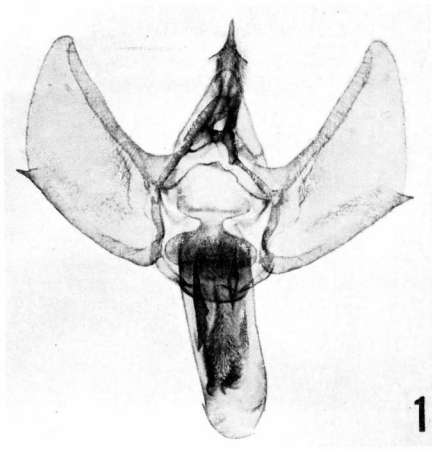
Fig. 2: *Eupithecia gelidata* Möschl. Female genitalia (×20) of same specimen as shown in Plate V fig. 3. (prep. 2532).

Fig. 3: *Eupithecia nanata* Hb. Male genitalia (×20). Denmark, Fanø. 27.VII.1924. Niels L. Wolff leg. (prep. 1400). [Not found in Greenland, pictured for comparison].

Fig. 4: *Eupithecia nanata* Hb. Female genitalia (×20). Denmark, Frøslev. 30.V.1935. Niels L. Wolff leg. (prep. 2644). [Not found in Greenland, pictured for comparison].

Fig. 5: *Eupithecia sobrinata* Hb. Male genitalia (×20). West Greenland, Ivigtut. 15. VIII.1948. P. Graff-Petersen leg. (prep. 1396).

Fig. 6: *Eupithecia sobrinata* Hb. Female genitalia (×20) of same specimen as shown in Plate V fig. 5. (prep. 2570).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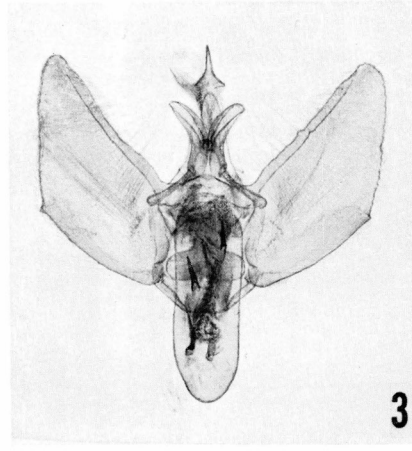
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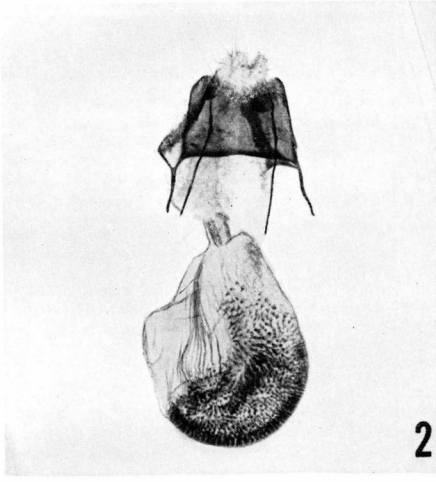
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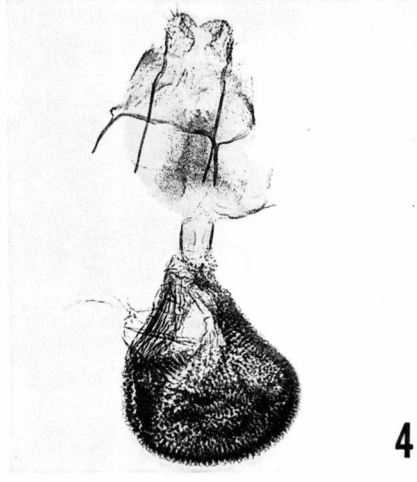
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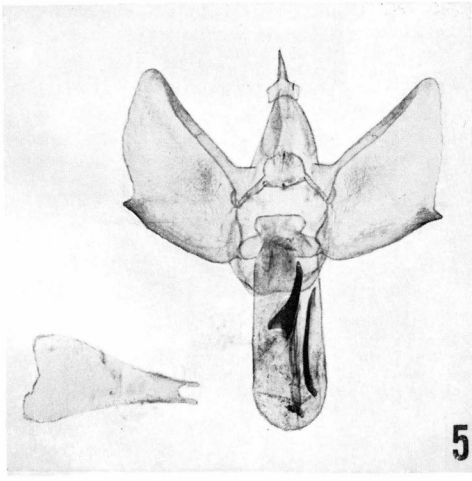
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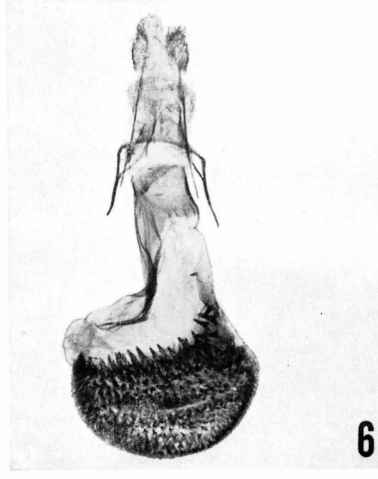
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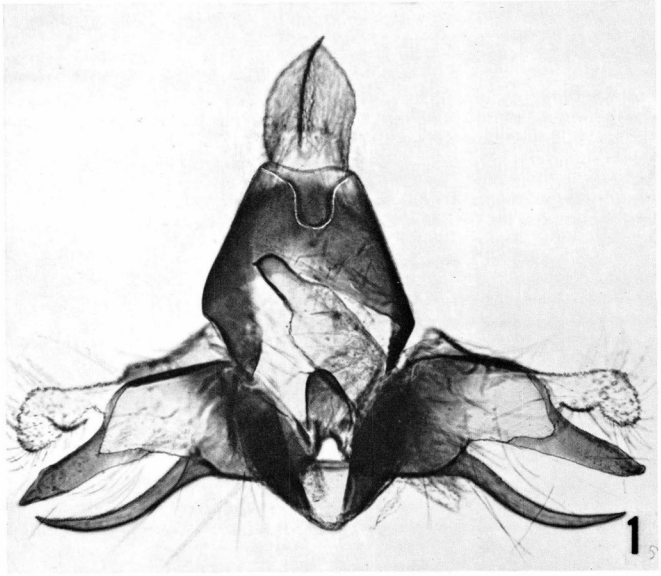
Plate XIV

Fig. 1: *Tehama bonifatella* HULST. Male genitalia (×50). West Greenland, Bredefjord 4.VIII.1948. CHR. VIBE leg. (prep. 1287).

Figs. 2–3: *Stenoptilia islandica* STAUD. Male genitalia (×70). North Greenland, North Heilprin Land 8.VII.1949. PALLE JOHNSEN leg. (prep. 2404).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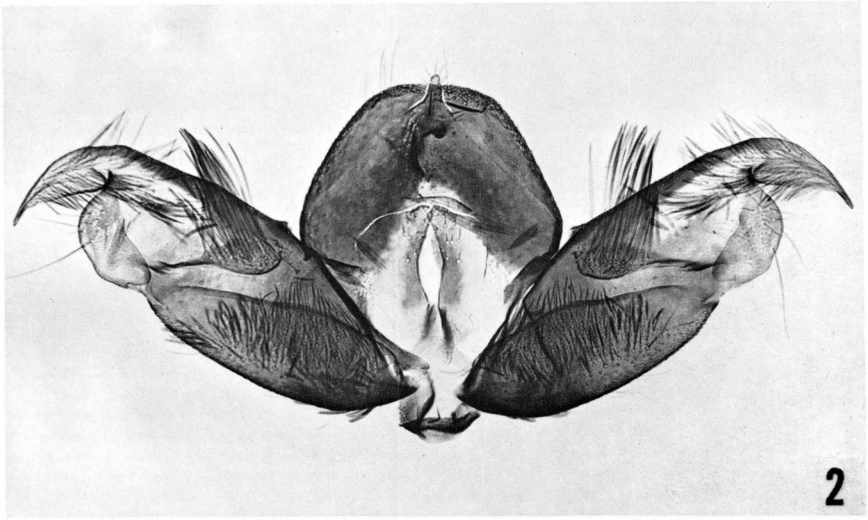
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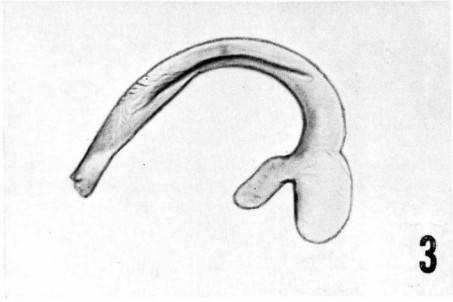
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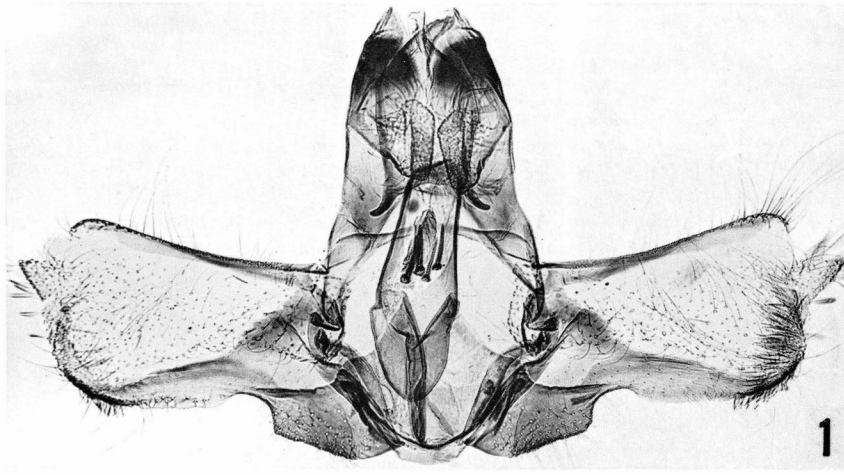
Plate XV

Fig. 1: *Acleris boreana* n. sp. Holotype. Male genitalia (×50). West Greenland, Narssarssuaq 24.V.1949. Chr. Vibe leg. (prep. 1264).

Fig. 2: *Acleris boreana* n. sp. Paratype. Male genitalia (×50). West Greenland, Kûgssuaq 27.VIII.1948. Chr. Vibe leg. (prep. 1291).

Fig. 3: *Acleris hastiana* L. Male genitalia (×50). Denmark, Harboøre 18.X.1928. coll. C. S. Larsen. (prep. 1506). [Not found in Greenland, pictured for comparison].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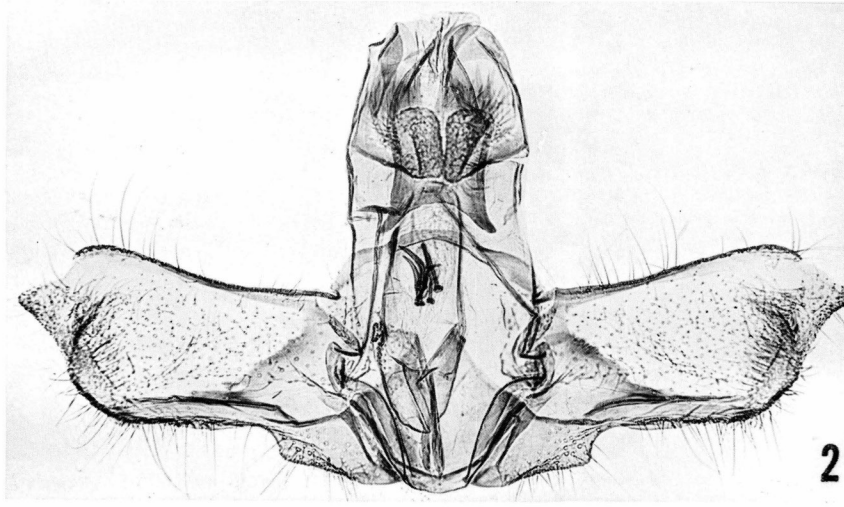
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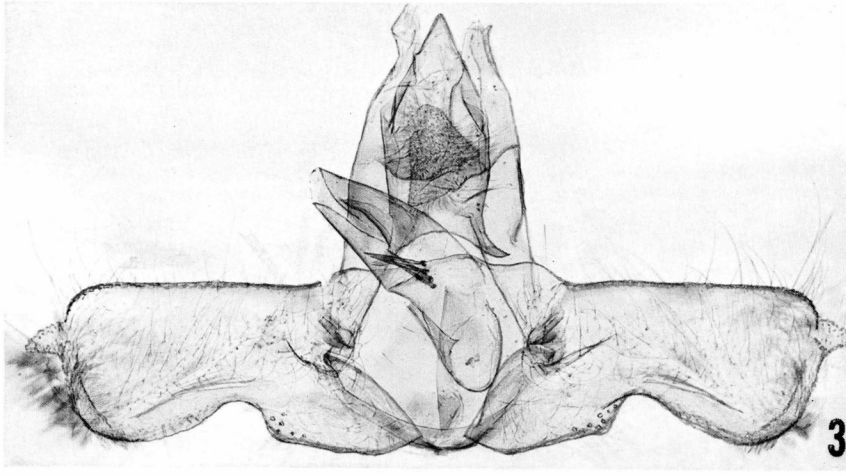
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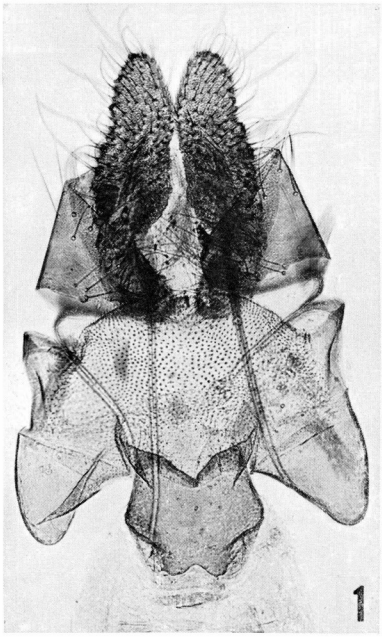
Plate XVI

Fig. 1: *Acleris boreana* n. sp. Allotype. Female genitalia (×60). West Greenland, Narssarssuaq 29.V.1949. CHR. VIBE leg. (prep. 1271).

Fig. 2: *Acleris boreana* n. sp. Paratype. Female genitalia (×60). West Greenland, Narssarssuaq 27.V.1949. CHR. VIBE leg. (prep. 1300).

Fig. 3: *Acleris hastiana* L. Female genitalia (×60). Denmark, Strøby Jærne 6.VIII. 1951. NIELS L. WOLFF leg. (prep. 1504). [Not found in Greenland, pictured for comparison].

Fig. 4: *Acleris hastiana* L. Female genitalia (×60). Denmark, Asserbo 4.X.1942. NIELS L. WOLFF leg. (prep. 1293). [Not found in Greenland, pictured for comparison].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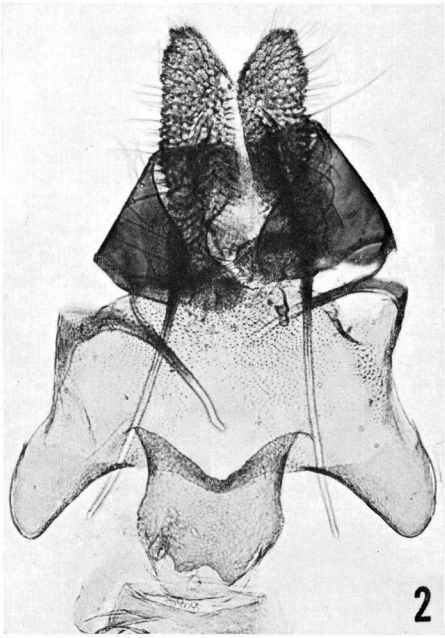
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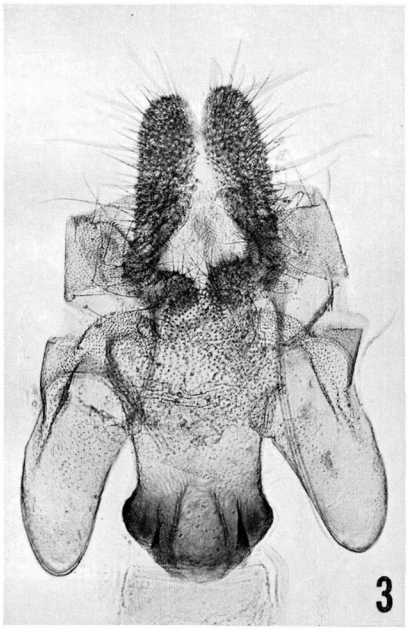
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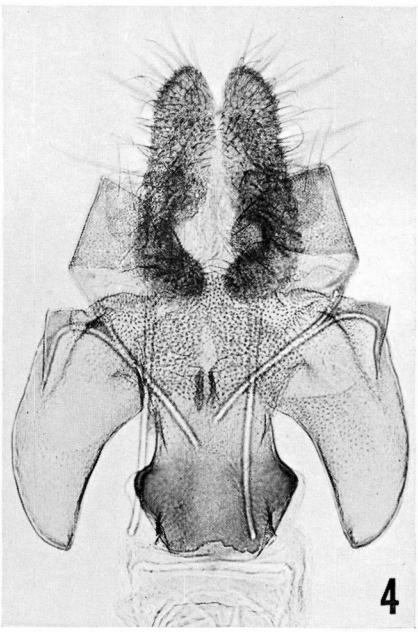
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Plate XVII

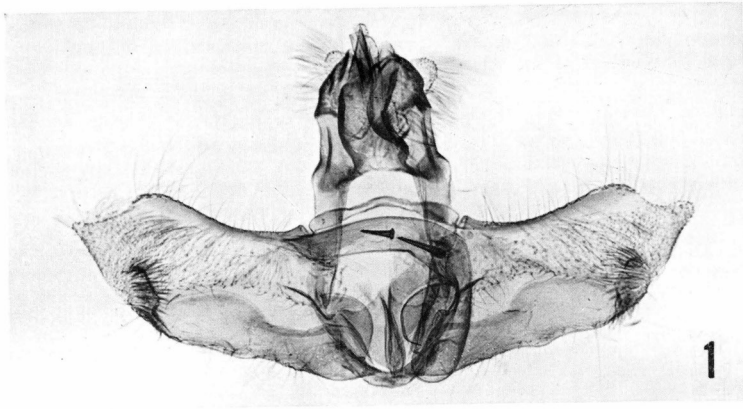
Fig. 1: *Acleris caryosphena* MEYR. Male genitalia (×50). West Greenland, Kapisigdlit 10.VIII.1950. CHR. VIBE leg. (prep. 2683).

Fig. 2: *Acleris caryosphena* MEYR. Male genitalia (×50). West Greenland, Narssarssuaq 24.V.1949. CHR. VIBE leg. (prep. 1266).

Fig. 3: *Acleris caryosphena* MEYR. Holotype. Male genitalia: aedeagus (×50). West Greenland, Søndre Strømfjord 18.VIII.1936. H. G. VEVERS leg. (prep. Hope Dept. Oxford Univ. 9106).

Fig. 4: *Acleris caryosphena* MEYR. Male genitalia: aedeagus (×50). West Greenland, Narssarssuaq 28.V.1949. CHR. VIBE leg. (prep. 1314).

Fig. 5: *Acleris ferrugana* TR. Male genitalia (×50). Denmark, Asserbo 12.X.1947. NIELS L. WOLFF leg. (prep. 1277). [Not found in Greenland, pictured for comparison].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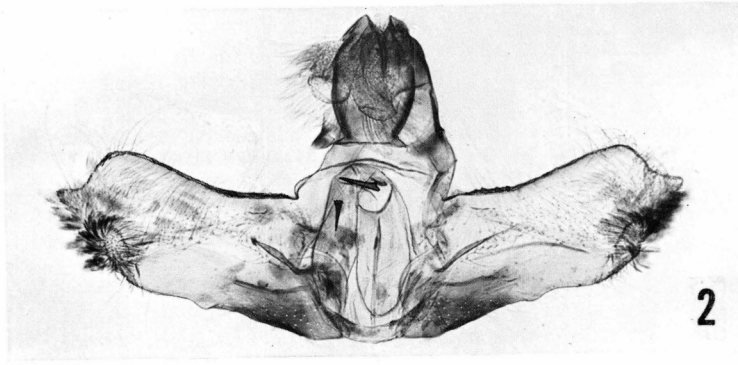
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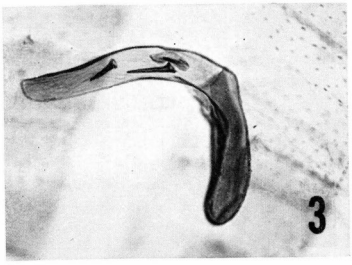
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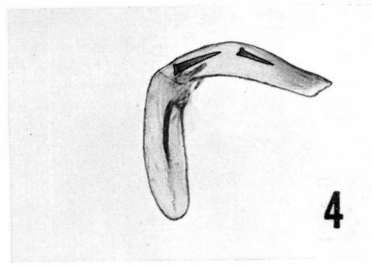
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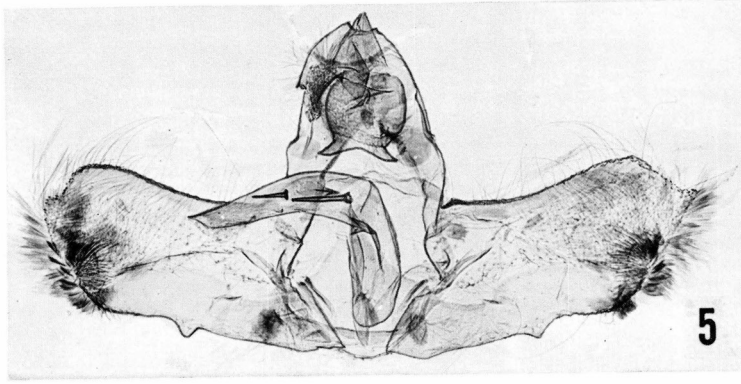
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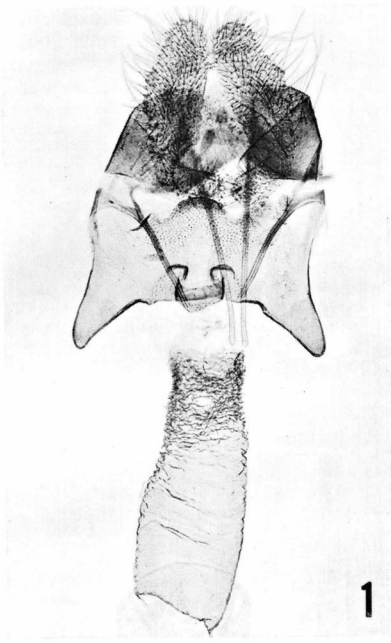
Plate XVIII

Fig. 1: *Acleris caryosphena* MEYR. Female genitalia (×55). West Greenland, Narssarssuaq 24.V.1949. CHR. VIBE leg. (prep. 1289).

Fig. 2: *Acleris caryosphena* MEYR. Female genitalia (×55). West Greenland, Narssarssuaq 30.V.1949. CHR. VIBE leg. (prep. 1265).

Fig. 3: *Acleris ferrugana* TR. Female genitalia (×55). Denmark, Asserbo 12.X.1947. NIELS L. WOLFF leg. (prep. 1278). [Not found in Greenland, pictured for comparison].

Fig. 4: *Acleris ferrugana* TR. Female genitalia (×55). West Iceland, Þrastalundur VIII.1936. G. GIGJA leg. (prep. 1337). [Not found in Greenland, pictured for comparison].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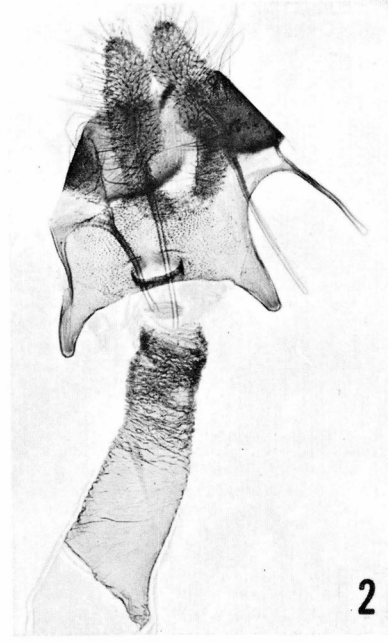
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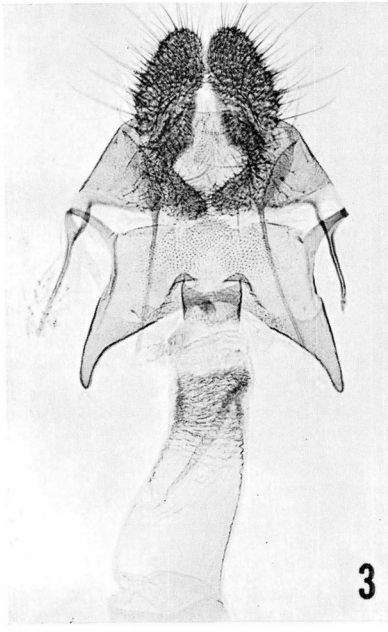
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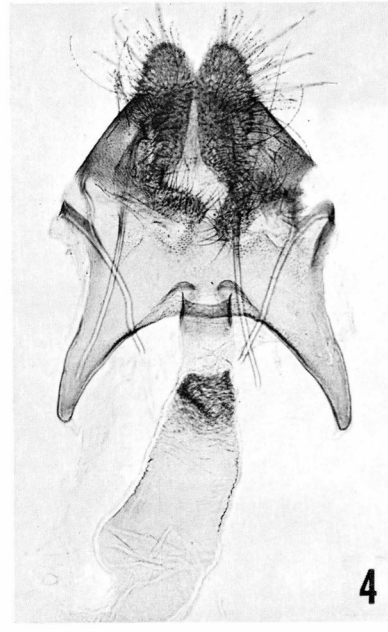
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Plate XIX

Fig. 1: *Argyroploce inquietana* Wlk. Male genitalia (×20). East Greenland, Knudshoved, Loch Fyne. ult. VII-pr. VIII.1930. B. Løppenthin leg. (prep. 2579).

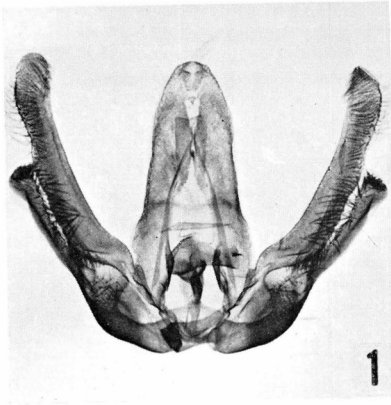
Fig. 2: *Olethreutes mengelana* Fern. Male genitalia (×20). East Greenland, Kap Osvald, Ella Ø. 7.VI.1934. F. Søgaard Andersen leg. (prep. 1297).

Fig. 3: *Scythris noricella* Zell. Male genitalia (×20). West Greenland, Sarqaq. 24.VII. 1949. Chr. Vibe leg. (prep. 1260).

Fig. 4: *Agonopteryx victori* de Lesse & Viette. Male genitalia (×35) of same specimen as shown in Plate VI fig. 9. (prep. 1267).

Fig. 5: *Phthorimaea valesiella* Staud. Paratype of *Phthorimaea charcoti* Meyr. Male genitalia (×65). East Greenland, Kap Dalton. 20.VIII.1933. D. Lack leg. (prep. 2510).

Fig. 6: *Epinotia indecorana* Zett. Male genitalia (×40). West Greenland, Qúmuk. 16.VIII.1942. Chr. Vibe leg. (prep. 1261).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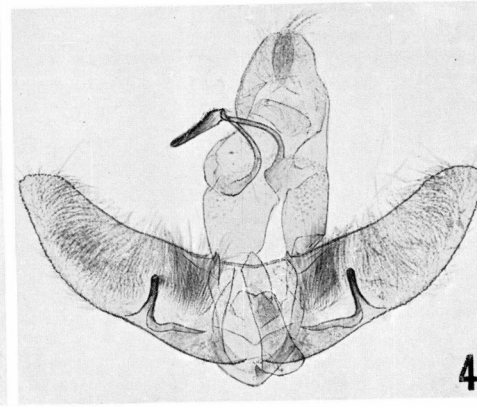
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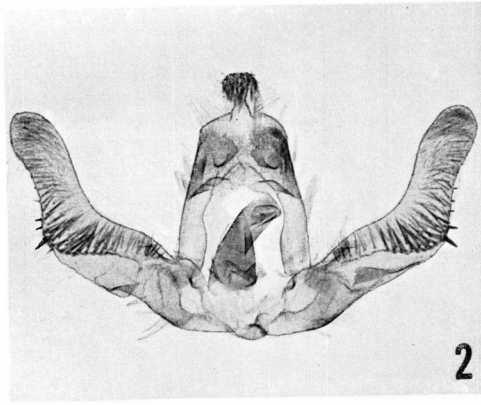
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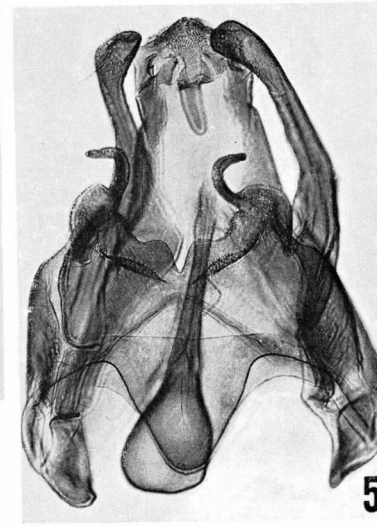
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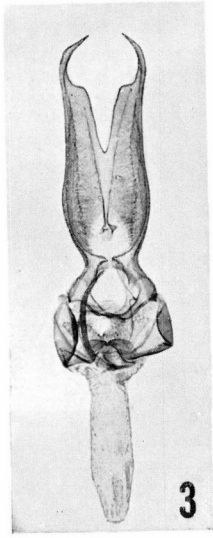
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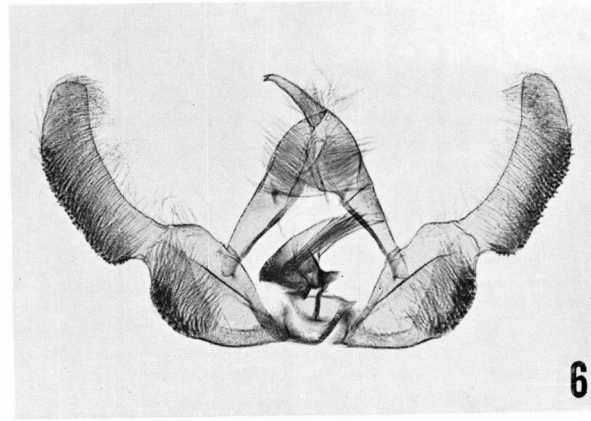
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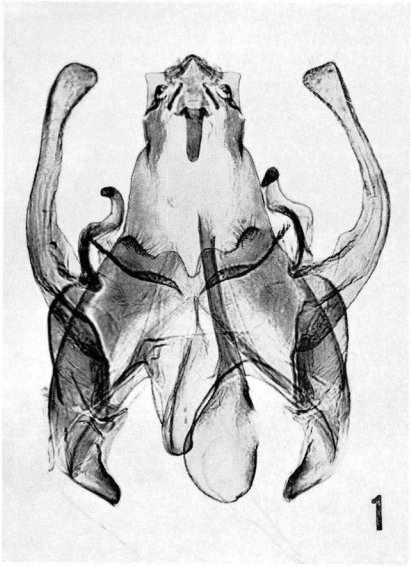
Plate XX

Fig. 1: *Phthorimaea valesiella* STAUD. Male genitalia (×55). East Greenland, Mesters Vig 8.VII.1955. HÁLFDAN BJÖRNSSON leg. (prep. 2855).

Fig. 2: *Phthorimaea valesiella* STAUD. Lectotype. Male genitalia (×55). Switzerland, Wallis. Coll. Zool. Mus. Berlin via coll. O. STAUDINGER. (prep. 2859).

Fig. 3: *Phthorimaea vibei* n. sp. Holotype. Male genitalia (×55). West Greenland, Søndre Strømfjord 20.VI.1952. CHR. VIBE leg. (prep. 2730).

Fig. 4: *Phthorimaea vibei* n. sp. Paratype. Male genitalia (×55). West Greenland, Søndre Strømfjord 20.VI.1952. CHR. VIBE leg. (prep. 2729).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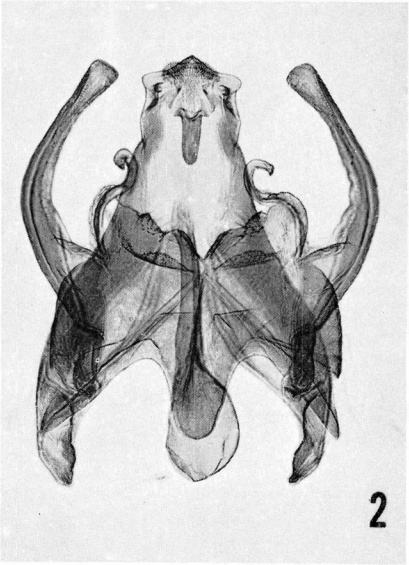
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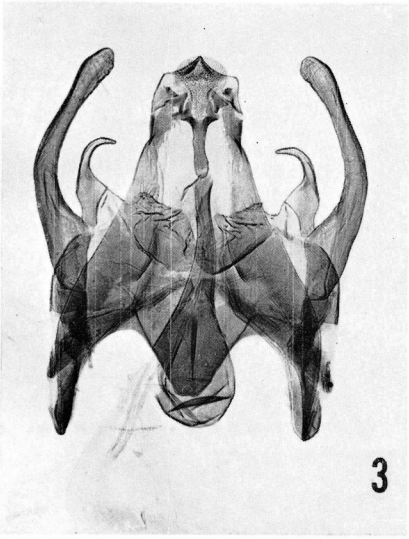
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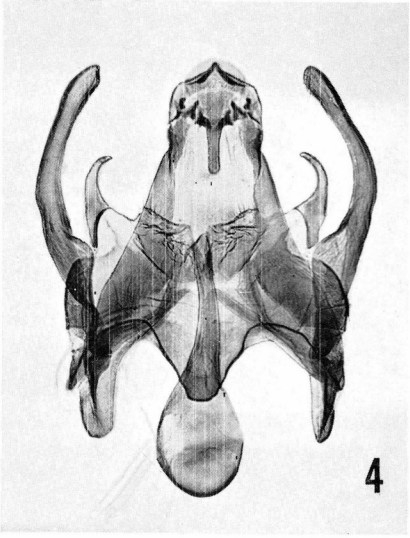
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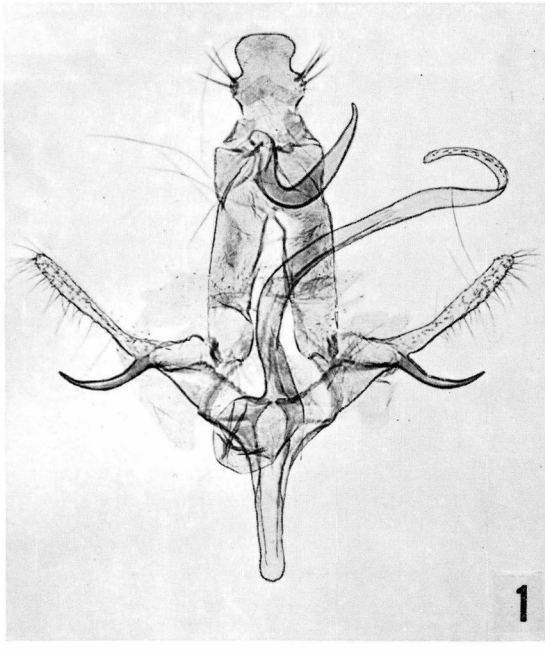
Plate XXI

Fig. 1: *Bryotropha similis* Stt. Male genitalia (×55). East Greenland, Mesters Vig 29.VII.1953. Chr. Vibe leg. (prep. 2590).

Fig. 2: *Bryotropha similis* Stt. Female genitalia: signum (×250). West Greenland, Sarqaq 30.VI.1949. Chr. Vibe leg. (prep. 2607).

Fig. 3: *Niditinea fuscipunctella* Haw. Male genitalia (×45). West Greenland without exact statement of locality. H. Deichmann leg. (prep. 2583).

Fig. 4: *Monopis rusticella* Hb. Male genitalia (×55). West Greenland, Bredefjord 5.VIII.1948. Chr. Vibe leg. (prep. 1262).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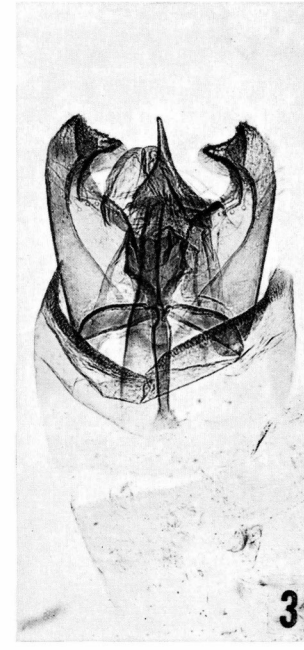
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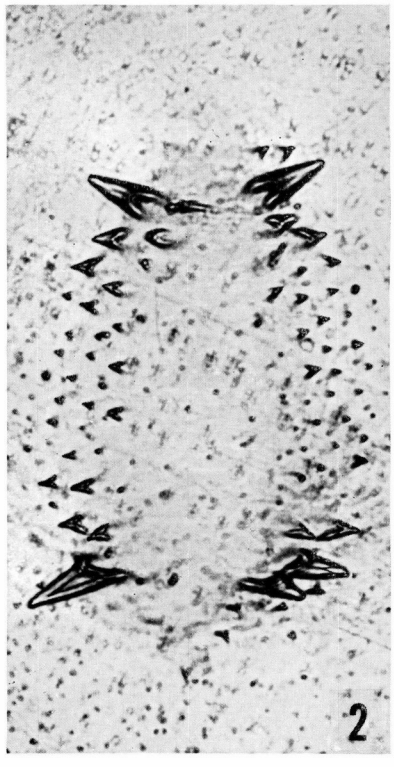
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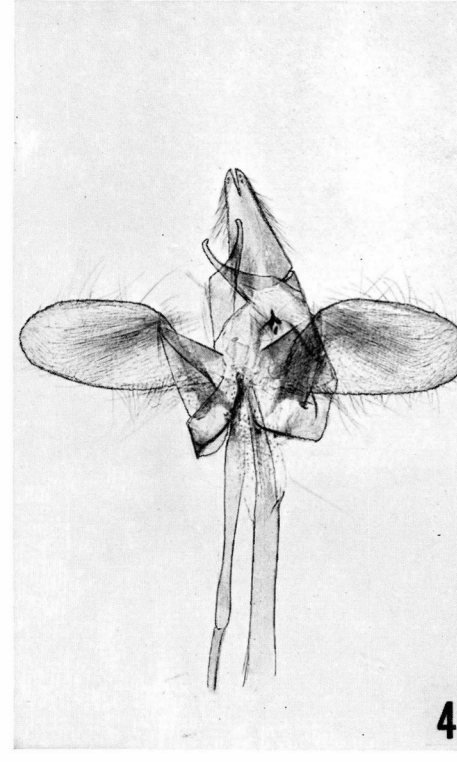
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