NORSK ENTOMOLOGISK TIDSSKRIFT

UTGITT AV

NORSK ENTOMOLOGISK FORENING

MED BIDRAG FRA

NORGES ALMENVITENSKAPELIGE

FORSKNINGSRÅD

1963

BIND XII — HEFTE 3-4

OSLO 1963

NORSK ENTOMOLOGISK TIDSSKRIFT

vil se sin hovedoppgave i å fremme det entomologiske studium i vårt land og danne et bindeledd mellom de interesserte. Medlemmer av Norsk entomologisk forening får tidsskriftet gratis tilsendt. Søknad om opptakelse i foreningen sendes til formannen. Medlemskontingenten er for tiden kr. 10.00 pr. år. For ikke-medlemmer og i bokhandelen beregnes prisen for komplette bind etter kr. 10.00 pr. 48 sider.

Arbeider som ønskes inntatt i NET sendes til redaktøren som maskinskrevet manuskript i trykkferdig stand. Tilføyelser eller rettelser i korrekturen som belaster trykningskontoen uforholdsmessig, vil bli debitert forfatteren. Avhandlingene bør fortrinnsvis omfatte nye iakttagelser, og forfatteren er selv ansvarlig for riktigheten av disse. Større arbeider skrives på engelsk, fransk eller tysk. Bare unntagelsesvis mottas arbeider på norsk med resumé på ett av disse språk. Forfatteren bør la en språkmann gjennomgå manuskriptet før dette innsendes. Redaksjonen forbeholder seg å la dette utføre på forfatterens bekostning, når den finner det nødvendig. Illustrasjoner og tabeller begrenses til det absolutt nødvendige, og plassen hvor disse skal innføyes i teksten avmerkes i manuskriptet. Tekstfigurer bør tegnes i strek med tusj. Alle illustrasjoner resp. tabeller nummereres fortløpende og forsynes med kort, klar tekst. Fortegnelse over benyttet litteratur settes til slutt i manuskriptet. Den ordnes alfabetisk etter forfatternavn. Etter forfatternavn settes avhandlingens trykkeår, derpå: avhandlingens tittel, event. tidsskriftets tittel, bind og sidehenvisning. I teksten henvises til litteraturfortegnelsen ved å angi forfatterens navn og trykkeår; hvor forfatteren har utgitt flere avhandlinger i samme år, nummereres disse med a, b, c osv.

Forfatteren får 50 særtrykk gratis. Ønskes ytterligere særtrykk, må bestilling innsendes sammen med manuskriptet.

Det henstilles til forfatterne at de ved angivelse av den geografiske utbredelse av norske arter nytter den inndeling i faunistiske områder som er utarbeidet av *A. Strand*, NET, Bd. VI, side 208 o. flg.

NORSK ENTOMOLOGISK FORENINGS STYRE OG TJENESTEMENN

Formann	Skogforsøksleder ALF BAKKE, Det Norske Skogforsøksvesen, Vollebekk.
Nestformann	Konservator ASTRID LØKEN, Zoologisk Museum, Universitetet i Bergen.
Sekretær	Forsøksassistent GUDMUND TAKSDAL, Statens Plantevern, Vollebekk.
Styremedlem	Lærer PER F. WAALER. Anna Rogstads vei 25, Årvoll, Oslo.
Styrets varamenn	Kontorsjef ANDREAS STRAND, Melumveien 38, Røa.
	Stud. real. REIDAR MEHL, Orionveien 9, Kjelsås.
Kasserer	Disponent C. F. LÜHR, Lom.
Revisor	Brukseier EIVIND SUNDT, Søndre Oppegård, Svartskog.
Redaktør	Førstekonservator NILS KNABEN, Zoologisk Museum, Oslo 5.
Red.-komité.....	Førstekonservator NILS KNABEN, Professor dr. A. SEMB JOHANSSON, Zoologisk laboratorium, Blindern, Skogforsøksleder ALF BAKKE.
Distributør.....	Statsentomolog JAC. FJELDDALEN, Statens Plantevern, Vollebekk.

The Norwegian Phycitids (Lepidoptera)

By M. Opheim, Oslo

The family Phycitidae which is a part of Pyraloidea, has been little studied in Norway, excepting the genus *Dioryctria* Zell. (Bakke 1959) and the warehouse pests (Sømme 1959, 1962). As several species are difficult to identify by superficial characters only, it is not surprising that many mistakes have been made by earlier collectors. A revision of the Norwegian material in our museums and institutions, seemed, therefore, quite necessary.

Through the courtesy of the officials mentioned below, I have have been able to examine the phycitids in the collections of the Zoological Museums at Bergen, Oslo and Tromsø, and in the Norwegian Institutes of Plant Protection (Division of Entomology) and of Forest Research, both at Vollebekk. To Mr. A. Bakke, Vollebekk, Mr. B. Christiansen, Tromsø, Mr. T. Edland. Ullensvang, Mr. J. Fjelddalen, Vollebekk, Miss A. Løken, Bergen, Mr. N. Knaben, Oslo, Dr. L. R. Natvig, Oslo, and Mr. Soot-Ryen, Oslo, my thanks are due for giving me permission to examine and also to dissect any specimen needed for my work.

For the gift of specimens I am greatly indebted to Miss A. Ulla, Oslo, and Mr. N. L. Wolff, Hellerup, Denmark. Information about phycitids was kindly given me by Mr. H. Marion, Decize (Nievre), France (conc. *Homoeosoma* Curt.), by Mr. R. Mehl, Oslo, Mr. A. Nielsen, Sandnes, Dr. A. Semb Johanssen, Oslo and Mr. I. Svensson, Østerslöv, Sweden.

Dr. W. Hackman, Helsingfors, has very kindly sent me specimens of dubious *Asarta aethiopella* Dup. from Finland for inspection. To Mr. N. Knaben I am further indebted for the photographs.

The collection of the Zoological Museum, Oslo, turned out to be particularly rich in phycitids, of which the greater part, including many undetermined specimens, was captured at Spro

(AK) by the late K. Haanshus. Of our total of 33 species, Haanshus found as many as 20.

For financial support my thanks are due to the Norwegian Research Council for Science and the Humanities.

Phycitinae

Group 1 (Vein 4 present in hind-wing)

Acrobasis Zeller, 1839

(Type of genus: *A. tumidella* (Zincken, 1818))

Our species of the genus belong to the oakwoods, flying only at dusk and after dark.

A. tumidella (Zincken, 1818) (= *A. zelleri* Ragonot).

Only 3 specimens are in the collection of the Zoological Museum Oslo, all of them taken by Haanshus at AK: Spro on July 29th 1923, July 23th 1927 and on August 1st 1927. I believe that is all collected so far in Norway.

A. consociella (Hübner, 1811—1817) (Pl. I, 5).

Also found at Spro by Haanshus, on July 28th 1925 (♂) and August 5th 1927 (♀). The species is not a recent addition to the Norwegian fauna as I discovered a ♀ among the *Rhodophaea advenella* (Zinck.) specimens in the museum collection. It was captured about 50 years earlier in Oslo (V. Aker) by Sparre Schneider on July 21st 1876.

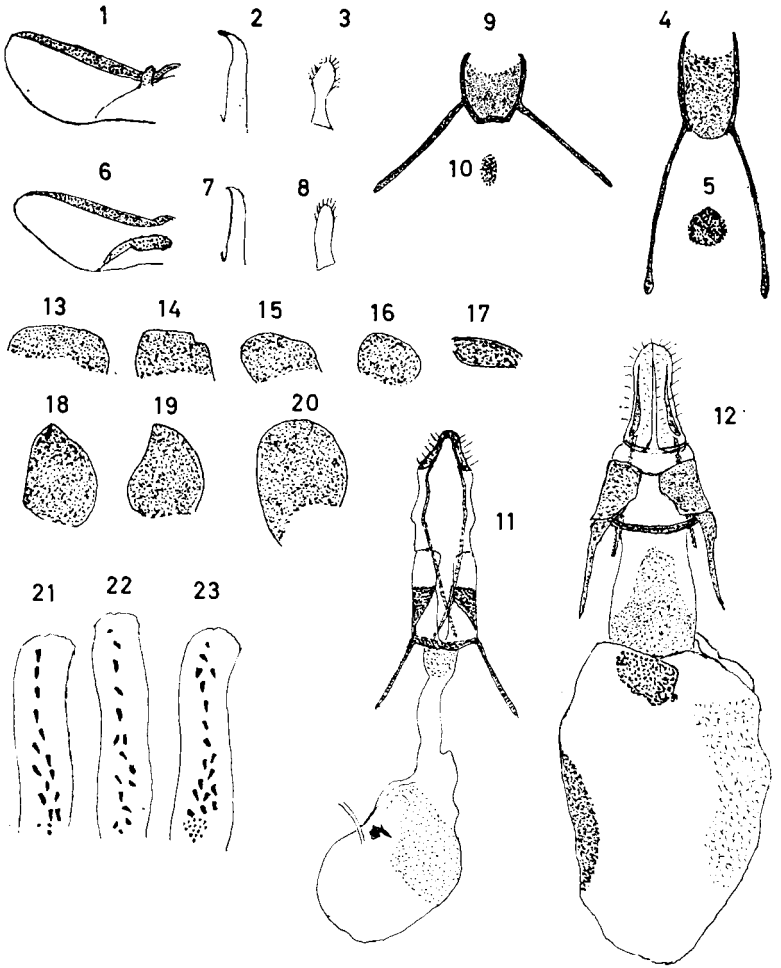
Outside the Oslo district, on a joint trip to TEy: Jomfruland, on July 18th 1963, a ♀ was attracted to fluorescent columns owned by my friend, O. Høegh-Guldberg, Horsens, Denmark.

A. consociella and the following species are very similar both in their superficial characters and their genitalia.

A. sodalella Zeller, 1848 (Pl. I, 1, 2).

From Miss A. Ulla, Oslo, I received several Lepidoptera captured by means of a M. V. bulb in July 1962 at TEy: Fossing in Sannidal. The prize of the lot was a worn male of *A. sodalella*, new to Norway. In North Europe it has only been reported from the Åland Islands in 1946. An old Danish record has been proved erroneous (Wolff 1959).

Later I discovered that the species had been taken in Norway about 40 years earlier. By dissection of some undetermined, rather worn phycitids, collected at Spro by Haanshus in the 1920's a ♂ captured on July 27th 1923 proved to be *A. sodalella*. And when visiting the Zoological Museum, Bergen, at New Year,



Figs. 1—3. *Acrobasis sodalella* Zell. ♂, Spro, Norway, 1. valva, 2. apical part of gnathos, 3. part of anellus; figs. 4—5. ♀, Laget, Norway, 4. dorsal view of 8th-segment collar, 5. signum. Figs. 6—8. *Acrobasis consociella* (Hb.) ♂ Spro, Norway, 6. valva, 7. apical part of gnathos, 8. part of anellus; figs. 9—10. ♀, Jomfruland, Norway, 9. dorsal view of 8th-segment collar, 10. signum. Fig. 11. *Myelopsis tetricella* (Schiff.), Spro, Norway, ♀-genitalia. Figs. 12—17. *Nephopteryx hostilis* (Steph.), 12. ♀-genitalia, Spro, Norway. 13—17. Granulate patch on ventral side of bursa. 13, Tromøy, Norway. 14—15. Denmark. 16—17, Spro, Norway. Figs. 18—19. *N. adelphella* (F.R.), granulate patch, 18. Germany, 19. Hungary. Fig. 20. *N. rhenella* (Zinck.), granulate patch (No loc.). Figs. 21—23. *Homoeosoma mucidella* Rag. ♂ .Spines along side of aedoeagus. 21. Graz, Austria. 22—23, Sandvika, Norway. Figs. 1, 4, 6, 9, 11—20. × 19, figs. 2, 3, 5, 7, 8, 10, 21—23. × 38. M. Opheim del.

two more ♂♂ and one ♀ turned up among the undetermined Microlepidoptera there. They were in good condition (Pl. I, 1, 2), being bred from larvae found among oak leaves inside a dense web, on March 8th 1928 at AAy: Laget by J. Knaben. Emergence took place on July 9th the same year.

The species differs from *A. consociella* in size (22—23 mm against 18—20 mm for *consociella*, based on Norwegian materials only), and also in colour, being reddish brown, not bluish-grey. The dark terminal spots on the fore-wing are usually larger in *A. sodalella*.

Regarding the male genitalia in the two species, the main differences lie in the shape of the anellus, being lobed in *A. sodalella*, the clasper, and the apical part of gnathos which is more strongly built and has a longer hook (figs. 1—3, 6—8). Also in the female genitalia there are minor differences between the two species. In particular the 8th-segment collar on dorsum (tergite) and the shape and size of signum (figs. 4, 5, 9, 10), seem to offer fairly distinct characters.

Rhodophaea Guénée, 1845

(Type of genus: *R. advenella* (Zincken, 1818))

R. advenella (Zincken 1818).

In Norway the species has only been observed in the extreme south-eastern part. It feeds mainly on *Crataegus*, but is also found on *Sorbus*.

R. advenella is an old-established species in Norway as there are several specimens in the Zoological Museum, Oslo, collected in the last century in Oslo environs: Bygdøy, Smestad, etc. July 18th—26th 1846, July 7th 1848 (Esmark), Tøyen July 27th—29th 1848 (Siebke), V. Aker 1880 (Sparre Schneider). Haanshus took a good series at Spro between 1919 and 1928. In AK also taken at Sandvika July 15th 1934 (Barca), Slependen July 1962 (A. Ulla). Outside AK, known only from Ø: Moss August 5th 1913 and August 7th 1915 (Barca), Bø: Søre Linnes in Lier September 5th 1951 (Opheim), VE: Budal in Tjøme August 26th 1963 (Opheim), AAy: Tromøy August 1st 1956 (Bakke).

Myelopsis Heinrich, 1956

(Type of genus: *M. coniella* (Ragonot, 1887))

M. tetricella (Schiffermüller, 1775).

Of the composite genus *Myelois* Hb. Heinrich has (l.c.) erected several new genera, one of them being *Myelopsis* Heinr. which comprises, besides a few North American species, also our own

M. tetricella (Schiff.). They are fairly closely related, having similar male genitalia with costa strongly sclerotized and the apical process of gnathos broadly U-shaped. The male genitalia of *M. tetricella* seem to be practically identical with those of the American *M. subtetricella* (Rag.,) but the female genitalia of the former differ in having a longer ductus bursae (fig. 11). It is not known what kind of food-plant the larva lives on for any of the species.

There are few observations of *M. tetricella* in Norway:

AK: Spro June 3rd 1921, June 20th 1927 (Haanshus); HEn: Havnesvangen in Tynset July 1926 (Rygge); On: Fokstua (Wocke); Fi: Alta (Wocke), Bosekop June 20th 1878 (Schøyen), Kåfjord June 29th 1924 (Barca); Fø: Sør-Varanger, Kirkenes June 27th 1895, Jarfjord June 14th 1897 (Wessel), Strand July 22nd 1899 (Wessel), June 29th 1901 (Sparre Schneider).

Pima Hulst, 1888

(Type of genus: *P. fosterella* Hulst, 1888)

P. boisduvaliella (Guénée, 1845).

This species which frequents coastal sandy fields and hills, was found new to Norway by A. Nielsen at Vig and Orre in Jæren in the 1950's. It is common there, and likewise at VAy: Lista in 1958 (Nielsen in litt.) but hitherto not observed elsewhere in the country. The Zoological Museum, Oslo, received 4 specimens, labelled June 12th 1955 as a gift from the collector. The larva has been found in the flowers of several plants, like *Anthyllis, Lotus, Ononis* etc.

Catastia Hübner, 1825

(Type of genus: *C. marginea* (Schiffermüller, 1775))

C. marginea (Schiffermüller, 1775) ssp. *aurociliella* Hübner, (1811—1817).

Distribution:

Ø: Bjørnåsen at Jeløy (Barca 1923); AK: Linderud in Oslo July 13th 1846 (Siebke); Os: Lillehammer, Ringebu (Schøyen); On: Helinstrand July 1944 (Knaben), Løken July 15th 1936; (Barca), Skogstad (W. M. Schøyen), Vang July 1905 (T. H. Schøyen), Beito July 1958 (Opheim), Hjerkin (Siebke); Bv: Iungsdalen July 1944 (Knaben); Dagali July 7th 1938 (Barca); HOi: Hardangervidda (Lie-Pettersen, Grønlien); SFy: Hegernæsnipa in Førde July 10th 1906 (Barca); MRi: Geiranger (Schøyen); STi: Rise, Drivstua (Boheman, Schøyen etc.), Kongsvoll (Schøyen, Grønlien) Nsy: Bodø (Schilde, Sparre Schneider); Nsi: Saltdal (Schøyen, Sparre Schneider, Rygge), Skarmodal, Røssvassholm (E. Strand); Nnø: Tysfjord (E. Strand); TRy: Skjervøy (Zetterstedt), Trondenes, Harstad, Dyrøy, Tromsø (Sparre Schneider); TRi: Nordmo, Frihetsli (Sparre Schneider); Fi: Alta (Wocke), Kåfjord June 29th, Jotkajok July 17th and Cævdne July 21st 1924 (Barca).

In Southern Norway the species seems to be absent along the coast, particularly in the west and extreme south.

C. kistrandella sp. nov. (Pl. II, 6—12).

Sparre Schneider (1893) in his list over the Lepidoptera of Northern Norway (Tromsø Lepidopterfauna pp. 138—149), records an "*Asarta* sp." from Porsanger. It is called "*Asarta æthiopella* Dup. (var.: an n.sp.?)" by W. M. Schøyen in his catalogue of Norway's Lepidoptera, published in the same year. In his private copy of Enumeratio Ins. Norv. III he has written Kistrand as the locality for the species. That corresponds with the latitude 70°25', mentioned in the catalogue. In all likelihood, K. J. Smith, manager of the telegraph office in Kistrand, was the collector. According to Tromsø Museums Aarsberetninger (Annual Reports) (1889—1891) the museum in those years received several insects from Smith, in particular Lepidoptera.

As far as I have investigated, no additional information on this phycitid from Porsanger seems to have been forth-coming. *Asarta aethiopella* (Pl. II, 13) is recorded without any further comment from arctic Norway in Staudinger-Rebel (1901), in Ragonot's Monograph (1901) and by Haanshus (1933).

In the arctic collection of the Tromsø Museum, there was no specimen under the "*Asarta aethiopella*" label. Evidently, it had been removed for closer inspection, only a piece of paper with the inscription "gigantella Sp. Schn." remained. But after some search I located a specimen of a phycitid, labelled Kistrand in another drawer, where it had been placed after the Tortricidae. As *A. aethiopella* is the only phycitid reported from Kistrand, there is no doubt that this specimen, a male, was the missing one (Pl. II, 6).

However, it could not belong to *Asarta* Zell., as vein 4 in the hind-wing was present, but, most likely, judging from its genitalia, to the genus *Catastia* Hb. as a hitherto undescribed species.

Description:

Antenna finely pubescent, maxillary palpus broadly scaled and labial palpus oblique, third segment longer than 1/3 of the second. Forewings dark slate-grey mixed with white scales. Both transverse lines white, antemedial line oblique and dentate, less distinct than the subterminal line. The latter conspicuously curved outward from vein 5 to midway between 2 and 1 b. (The species is easily identified by this character.) Between vein 5 and costa, oblique with a dark spot on the inside at costa. Discal spots black, confluent (Pl. II, 6). The central area relatively wider than in *A. aethiopella*, vein 10 separated from 8 + 9 (or short stalked); 8 and 9 stalked for about half their lengths; 4 and 5 well separated. Hind-wings smoky-grey with a light

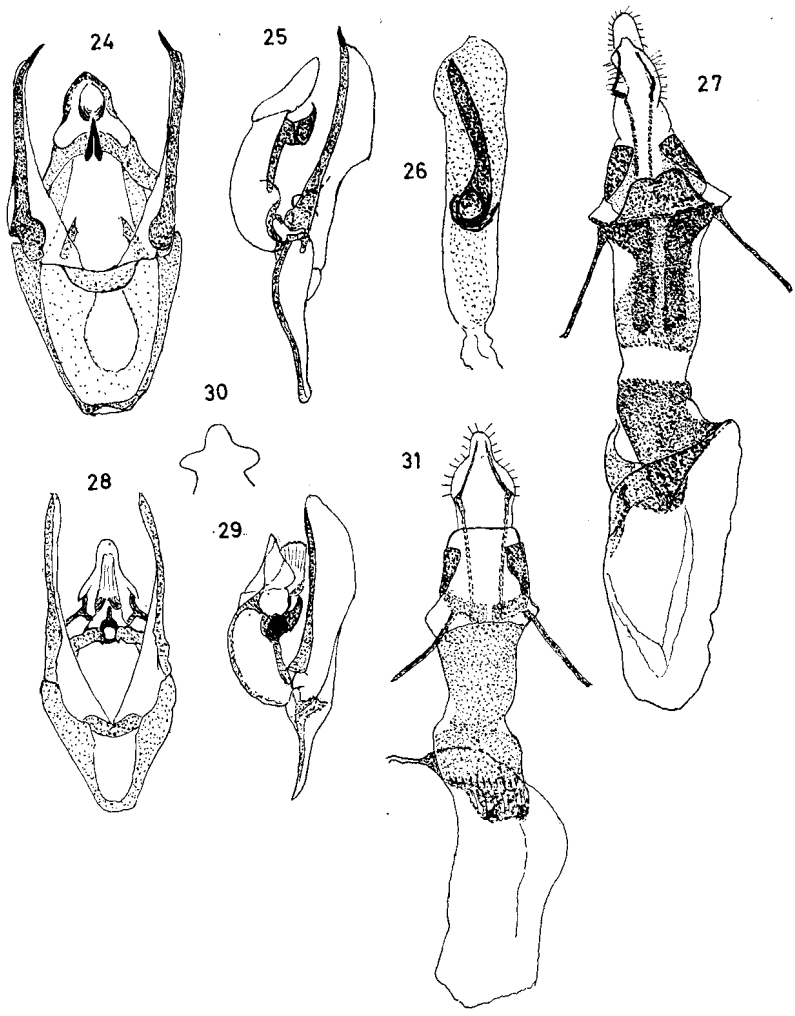
subterminal band; at termen much darker. Vein 3 from the angle of the cell, separated from discocellular vein by a short spur, from which 4 originates. The latter vein for a short distance well separated from 5 as in *Polopeustis* Rag. Alar expanse: 21 mm.

Genitalia (male) similar to those of *Catastia* Hb. (see Heinrich figs. 314—317); valva with sclerotized costa produced with projecting spine, cucullus narrow. Clasper present. Apical process of gnathos small, like that of the North American species, *C. bistriatella* (Hulst), *C. incorruscella* (Hulst) and *C. actualis* (Hulst). In *C. marginea* (Schiff.) it is about twice as large (fig. 24, 25), Vinculum stout, just as long as its greatest width. Aedoeagus with a strong spine (fig. 34). Tufts of 8th abdominal segment simple as in *Catastia* (fig. 36). Holotype: ♂ from Kistrand (Fn), Norway, captured around 1890; in the collection of Tromsø Museum.

Later I found 3 ♂♂ in a little collection of the late T. H. Schøyen (Pl. II, 7—9). They were without labels, but obviously taken in the Porsanger district at the beginning of July 1907. At that time Schøyen collected some arctic Lepidoptera in the same district. The 3 ♂♂ measured 20,5—21,5 mm. One of them was dissected (figs. 32, 33) and its genitalia were in full agreement with those of the type specimen, except that tegumen and uncus were bent more inward in the latter.

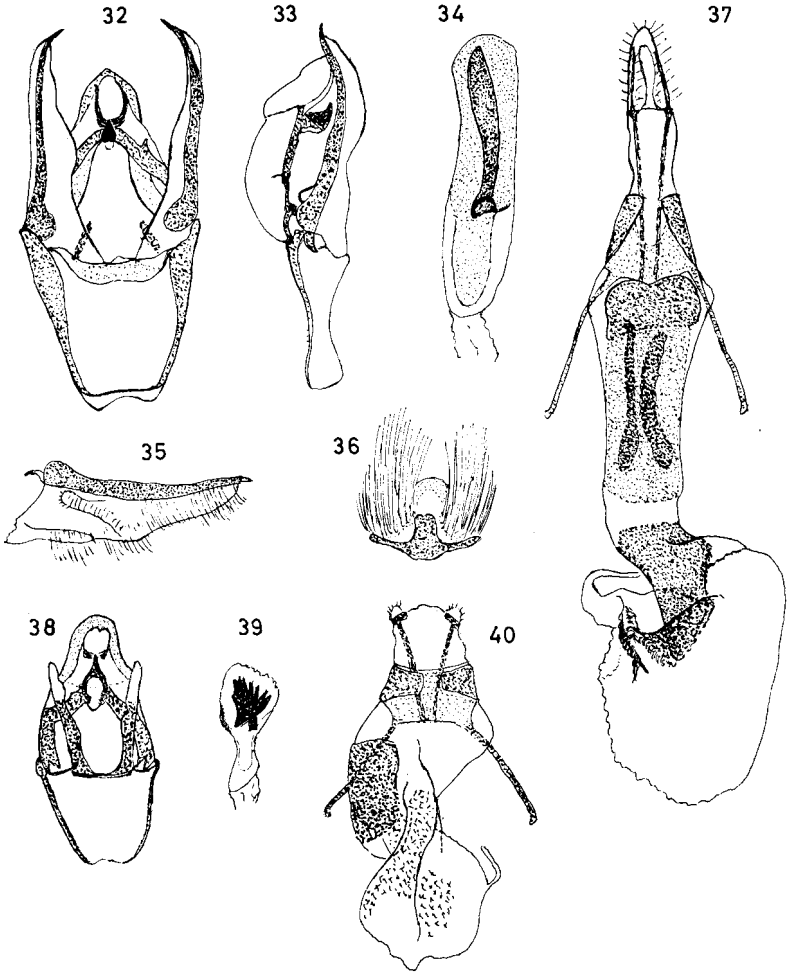
As *Asarta aethiopella* also has been reported from Kilpisjärvi in Finland, collected by Karvonen 1929 (Not. Ent. (12), 1932, p. 108), I was anxious to find out if the identification had been correct. I therefore asked my friend, Dr. W. Hackman, Keeper in the entomological department of the Zoological Museum in Helsingfors, to let me examine Finnish material of *A. aethiopella*. He very kindly sent me 2 ♂♂ and 1 ♀, all of them collected on the mountain Malla at Kilpisjärvi (♂, on July 3rd, 1934, Karvonen leg., ♂, ♀ on July 2nd 1936, Lankiala leg.). They were considerably smaller than the Norwegian specimens, measuring only 18 mm (males) and 18,5 mm (female), but in other respects quite similar (Pl. II, 10—12).

The genitalia of one of the males were in full agreement with those of the Norwegian. The genitalia of the female were found to be more similar to *C. marginea* than to the North American species of the genus, by having ductus bursae sclerotized all the way from ostium to the junction with bursa, except for a narrow space at the middle (fig. 37). On the dorsal side of ductus bursae there are a pair of elongated plates, a character which distinguishes *Catastia* from other related genera. Bursa is without signa and unsclerotized except at the junction with ductus bursae. *C. kistrandella* differs from *C. marginea* mainly



Figs. 24—26. *Catastia marginea* (Schiff.), Germany, ♂-genitalia. 24., Ventral view. 25. Lateral view. 26. Aedoeagus. Fig. 27. ♀-genitalia, Beito, Norway. Figs. 28—30. *Ortholepis betulae* (Deg.). Germany, ♂-genitalia. 28. Ventral view. 29. Lateral view. 30. Uncus, flattened. Fig. 31. ♀-genitalia, Germany. × 19. M. Opheim del.

in the shape of the elongated plates which are larger and widened at ostium in the latter species. Furthermore, ductus bursae at ostium ends in a simple, ventral plate which in *C. kistrandella* is rounded, but more of a trapezeate shape in *C. marginea* (fig. 27). In both species the plate has a faint incision in the middle.



Figs. 32—36. *Catastia kistrandella* sp. nov. ♂-genitalia. Porsanger, Norway (paratype). 32. Ventral view. 33. Lateral view, 34. Aedoeagus. 35. Valva. 36. Tufts and sclerotization of 8th-abdominal segment. Fig. 37. ♀-genitalia, Malla, Kilpisjärvi, Finland. Figs. 38—40. *Asarta aethiopella* Dup. ♂-genitalia, Glockner, Austria. 38. Ventral view. 39. Aedoeagus. 40. ♀-genitalia, Alpes. × 19. M. Opheim del.

C. kistrandella may be considered as a link between *C. marginea* and the North American species of the genus.

It is highly improbable that *Asarta aethiopella* belongs to the Fennoscandian fauna (genitalia, figs. 38—40).

The genus *Catastia* seems to have a holarctic distribution: mountains in Europe, western U.S.A. and Canada, and also in the arctic zone in Fennoscandia.

Salebria Zeller, 1846

(Type of genus: *S. palumbella* (Schiffermüller, 1775))

S. palumbella (Schiffermüller, 1775)

In Norway the distribution of the species is south of 60°30'.

AK: Drøbak July 1911 (Barca), Spro, many specimens from 1915 to 1928; dates of capture from June 28th to August 30th (Haanshus). VE: Fredriksvern July 1919 (Rygge). AAy: Laget in Holt July 12th 1922, July 15th 1930 (J. & N. Knaben), Risør (Thorstensen), Tromøy July 10th, 14th 1955, June 28th, August 4th 1957 (Bakke). Ri: Forsand June 23rd 1945 (N. Knaben). HOi: Djønno in Kinsarvik August 2nd 1938 (Lundetræ 1939), Ullensvang July 1962 (T. Edland).

The larva is polyphageous.

Ortholepis Ragonot, 1887

(Type of genus: *O. jugosella* Ragonot, 1887)

O. betulae (Degeer, 1773) new comb.

The phycitid previously known as *Salebria betulae* (Deg.) should be removed to *Ortholepis* Rag., as it has very much in common with the North American species of this genus, specially with *O. pasadamia* (Dyar) which also lives on *Betula*. All those particular species have a ridge of raised scales on the inner side of the antemedial line in the fore-wing. Regarding the male genitalia, uncus is subtriangulate and lobed near its lower, lateral angles (only slightly in the American species). Gnathos, valva and aedoeagus in *O. betulae* are similar to those of the others (Heinrich fig. 329, my figs. 28, 29). The female genitalia of *O. pasadamia* also come very close to those of *O. betulae* (Heinrich fig. 807, my fig. 31) with the flattened and strongly sclerotized ductus bursae and the lobed area near ductus seminalis.

The first record of *O. betulae* in Norway, is the discovery of 3 larvae at TRi: Bjerkeng in Øverbygd in 1885 by Sparre Schneider. All of them emerged as ♀♀ in August the same year. The species was later reported from Akershus (Haanshus 1933), possibly referring to 4 specimens under the "*S. betulae*" label in the Z. M. (Oslo) collection, taken at Spro from 1915 to 1928. They were all found to be *Laodamia faecella* (Zell.). But the record from Akershus holds good as I discovered a ♂ from Spro, captured on July 25th 1924, among the "*P. fusca*" material in the collection.

In Sweden the species has been recorded from 10 counties (Benander, 1946, 1953), so it is strange that we have observations from only two localities in our country.

Polopeustis Ragonot, 1893

(Type of genus: *P. altensis* (Wocke, 1862))

P. altensis (Wocke, 1862)

Benander (1940, p. 57) by examining Zetterstedt's type specimens of *P. annulatella*, discovered that these really were *Pyla* (*Salebria* auct.) *fusca* (Haw.) and that *altensis* Wck. would be the valid name for this arctic species.

In Norway *P. altensis* is not found south of the Polar circle. It occurs mainly where *Astragalus alpinus* grows which might be the food-plant of the larva, according to the opinion of the late Sparre Schneider (1907, p. 135).

P. altensis is closely related to *P. arctiella* (Gibson), known from Alaska, Labrador and Manitoba. Aedoeagus is armed with two strong cornuti in the latter species, while *P. altensis* only has one (Heinrich l.c.).

Distribution:

Nsi: Saltdal, Junkerdalsur (Schøyen, Sparre Schneider), Storjord (Rygge); Nnø: Fjellbu in Skjomen July 1950 (Opheim); TRi: Lihammeren, Salvasskarfjell, Altevand, Skjeggesnes, Mauken, Frihetsli (Sparre Schneider), Annavatn July 14th 1962 (Mehl); Fi: Alta, Bosekop (Wocke, E. Strand); Fn: Festningstua in Kistrand August 3rd 1924 (Barca); Fø: Sør-Varanger, Jakobselv, many specimens (Sandberg, Wessel), Kirkenes, Elvenes, Neiden (Wessel).

Nephopteryx Hübner, 1825

(Type of genus: *N. rhenella* (Zincken, 1818))

N. hostilis (Stephens, 1834) (Pl. I, fig. 3)

While checking up on some undetermined pyralids collected at Spro by Haanshus, two worn ♀♀ of a *Nephopteryx* species were discovered, which, by dissection, came close to *N. hostilis* (Steph.) (fig. 12). They had been found on August 5th 1926 and July 1st 1927. Another worn ♀ of *N. hostilis* from Spro, taken on July 16th 1927 had been wrongly placed among the "*P. fusca*" material in the Z. M. (Oslo) collection. As the genitalia of the ♂ seemed to differ somewhat, I asked Mr. N. L. Wolff, Hellerup, to send me a few Danish specimens for the sake of comparison. Generously, he supplied me with 3 ♀♀ and 1 ♂ as a gift. It is the conspicuous, strongly sclerotized patch on bursa which is subject to some variation, but even then the species is easily distinguished by this character. In *N. hostilis* the patch is of a rectangular shape, but in the related species, which might be found in Norway, *N. rhenella* (Zinck.) and *N. adelphella* (F. R.) it is respectively circular and pointed (figs. 13—20). Still another ♀ of *N. hostilis*

I found in A. Bakke's collection, Vollebekk. It had been taken at AAy: Tromøy on July 10th 1955. The larva feeds on *Populus tremula.*

N. semirubella (Scopoli, 1763)

W. M. Schøyen (1887) recorded this species new to Norway based on a worn specimen without locality label in the Esmark collection. Schøyen assumed that it might have been taken at Kristiania (Oslo), but as Esmark had many foreign Lepidoptera in his collection and as no other observation has been forthcoming it should be deleted from the AK list.

N. semirubella seems for the time being, to be restricted to a small section in the inner part of Sogn (SFi). It was first taken at Blåflat and Ljøsne in Lærdal in 1897 by Lie-Pettersen who collected 4 specimens there. The species was fairly common on grassy slopes (Lie-Pettersen 1897). The next record is from Otternes in Aurland, where Knaben in 1941 took a specimen on August 14th. In 1954 I visited Lærdal and also collected a specimen on a hillside near Seltun (further up the valley) on July 4th. The larva feeds on *Lotus* and *Trifolium.*

Pyla Grote, 1882

(Type of genus: *P. scintillans* (Grote, 1881))

P. fusca (Haworth, 1828)

A widely distributed insect in Norway, mainly found on heaths. Beirne (1954) writes that "The moths tend to congregate on the burnt parts of heaths where they sit on the tops of burnt twigs, which they closely resemble in colour."

Distribution:

Ø: Rauer July 5th 1920 (Barca); AK: Oslo, Frogner (Esmark), Hovedøya (Sparre Schneider), Holmenkollen June 6th 1919 (Rygge), Sandvika July 16th 1932 (Barca), Spro, several specimens between 1915 and 1927 (Haanshus); AAy: Risør (Thorstensen), Tromøy June 29th 1957 (Bakke); VAy: Sireosen (E. Strand), Søgne July 1960 (Opheim); VAi: Sirdal (Strand): (?) HOy: Bergen (Sølsberg); HOi: Hardangervidda (Grønlien); SFi: Høglii at Målset July 8th 1941 (Knaben); Nsi: Saltdal, Junkerdalsur, Pothus (Schøyen, Sparre Schneider), Storjord and Tollå in Beiarn (Sparre Schneider), Hattfjelldal (Strand); Nnø: Hamarøy (Strand); TRi: Malangen, Målselv, Nordmo, Nymo, Bjerkeng (Sparre Schneider); Fv: Talvik (Zetterstedt 1840, as "*P. annulatella*"), Sopnes (Strand), Kvalfjord August 10th 1955 (Knaben); Fi: Alta, Bosekop (Staudinger, Wocke, Sparre Schneider), Karasjok July 14th 1947 (N. Lønøy); Fø: Sør-Varanger, Elvenes, Kirkenes, Langfjorddal, Kobbervik, Strand, Bjørnsund, Ramaguøsk, Sevvesuola, Bodsejavre, Jakobselv, Aleknjarg in Polmak (Sparre Schneider).

The larva feeds on heath etc.

Laodamia Ragonot, 1888

(Type of genus: *L. faecella* (Zeller, 1839))

L. faecella (Zeller, 1839)

The old record from Dovre (Wallengren 1871) was not considered reliable by Schøyen (1893), and, furthermore, the species has never been found since in that fairly good investigated district. The only place where *L. faecella* is known from is Spro (AK). Haanshus collected about 30 specimens there between 1915 and 1928 (June 7th to August 28th). The larva is unknown.

Selagia Hübner, 1818

(Type of genus: *S. argyrella* (Schiffermüller, 1775))

S. spadicella (Hübner, 1796)

Barca (1922) reported the species as new to Norway, captured at Rauer (Ø). In the Z. M. (Oslo) collections there are 4 specimens from that locality, one taken on August 5th 1920 and the others on July 20th 1921, and also one from Sarpsborg on August 15th 1921. A series of 12 specimens is due to Haanshus, who took the first as early as August 4th 1916, the others are from July 15th 1918 to August 1st 1923. Besides the above mentioned localities, it has only been found at Laget (AAy) in August 1923 by Knaben (Grønlien 1925).

Dioryctria Zeller, 1846

(Type of genus: *D. abietella* (Schiffermüller, 1775))

Our 4 *Dioryctria* species have been treated in a paper by Bakke (1959).

D. splendidella (Herrich-Schäffer, 1851)

The species is only reported from Ø, AK and AAy.

D. abietella (Schiffermüller, 1775)

We have records from Ø, AK, HEs, AAy, Ry and SFi. Recently, also found at Skodje (MRy) (Semb Johansson).

D. schützeella Fuchs, 1899

At present, only taken in AK. A new record is Slependen July 1962 and 1963 (A. Ulla).

D. mutatella Fuchs, 1903

The species is known from AK, VE, AAy, Nsi and, possibly, also from Fi. It was recently taken at Ry: Bjerkreim (A. Nielsen in litt.) and VE: Budal in Tjøme, ♂, August 26th 1963 (Opheim).

Phycita Curtis, 1828

(Type of genus: *P. spissicella* (Fabricius, 1777))

P. spissicella (Fabricius, 1777) (Pl. I, 4)

Mr. Ingvar Svensson, Österslöv, Sweden, has informed me (in litt.) that he captured the species on July 8th 1953 at Ø: Jeløy as new to Norway. However, *P. spissicella* is not a newcomer to the fauna of our country, as I discovered a ♀ among the "*P. fusca*" specimens in the Z. M. coll. (Oslo), labelled Spro, August 12th 1915 (Haanshus leg.). Another ♀ was found in the Zoological Museum at Bergen, among the undetermined Microlepidoptera there. It was captured at AAy: Laget on July 12th 1922 by J. & N. Knaben.

Using a MV-bulb, Bakke was able to collect 6 specimens at AAy: Tromøy, one ♂ on August 1st 1956, and 2 ♂♂ and 3 ♀♀ from July 23rd to August 2nd 1957.

P. spissicella is an oakwood insect, its larva living under a silken web among the leaves.

Hypochalcia Hübner, 1825

(Type of genus: *H. ahenella* (Schiffermüller 1775))

H. ahenella (Schiffermüller, 1775)

This species seems to be confined to the eastern part of Norway, going as far north as 62° at Vågå.

Distribution:

Ø: Moss, Sarpsborg (Barca); AK: Oslo (Esmark, Sparre Schneider, Siebke), Slependen (Rygge, A. Ulla), Spro (Haanshus); HEs: Helgøen (Esmark), Hamar (Bakke); HEn: Åset (Siebke); Os: Øyer (Siebke), Ringebu (Barca); On: Fron (Siebke), Bøverdalen (Schøyen), Kvarberg in Vågå (Opheim) Bø: Norderhov July 11th 1874 ("H. *melanella*" Fr. = "*H. lignella*"), Staudinger det., Siebke leg., Sparre Schneider (1876). The specimen is not present in the Z. M. collection; VE: Larvik, 2 ♂♂ July 12th 1882 (as "*H. lignella*", Schøyen);

Regarding *H. lignella* Hb. I have examined the genitalia of the 2 ♂♂ from Larvik, but no difference was to be found from those of *H. ahenella* (Schiff.). *H. lignella* has not been captured in any of the Scandinavian countries.

The food-plant of the larva is not known, but might be *Hieracium pilosella* (Beirne 1954).

Group 2 (Vein 4 absent in hind-wing)

Homoeosoma Curtis, 1833

(Type of genus: *H. sinuella* (Fabricius, 1794))

H. nimbella Duponchel, 1837

Barca (1922) records the capture of "*H. nimbellum* Z." on

the small island Rauer (Ø) on July 7th 1920 as new to Norway. The specimen in question could not be found in the Barca collection, and we might therefore consider it lost. Furthermore, we cannot be sure about the identity of the Barca specimen, since Bentick (Tijds. Ent. 73 (1930), p. 237) has proved that *H. nimbellum* Z. is a composite species. (Regarding genitalia of the *Homoesoma* species, see Pierce 1938 and v. Deurs 1942).

The name *H. nimbella* Dup. (Joannis (Bull. Soc. Ent. Fr. 7 (1906), p. 154) established that the publication of Duponchel* was anterior to that of Zeller) now refers to the species which differs from the others of the genus, in the absence of vein 5 in the fore-wing. It is quite possible that it might be discovered in Norway as it occurs in Sweden and Denmark.

H. mucidella Ragonot, 1887 = *pseudonimbella Bentinck*, 1936 new syn.

All the specimens under the "*H. nimbellum* Z." label in the Z. M. (Oslo) collection, except one which was a ♂ of *Ephestia elutella* (Hb.), taken at Spro June 29th by Haanshus, belonged to *H. mucidella* Rag. The oldest one was a ♀, also collected by Haanshus at Spro on August 17th 1927. The rest, 5 ♂♂ and 4 ♀♀ were found at Sandvika (AK) by Barca, one ♂ from 1931, the others from July 15th to 30th 1934.

I think there are good reasons to consider the European *H. pseudonimbella* conspecific with the American *H. mucidella* Rag. According to Heinrich (l.c. p. 226) the only difference in the genitalia between the two forms, is the number of spines on aedoeagus (Heinrich writes *H. nimbella* Zell. instead of *H. pseudonimbella* Bent.). He mentions that the number of spines in the American species varies between 10—15, while the European form has 19—23 spines, but he does not consider the size, which seems to vary from tiny thorns to strong teeth. Counting only the well developed ones, two ♂♂, one from Graz, Austria, and the other from Sandvika, Norway, were found to have only 14 spines. (fig. 21, 22) From the last locality I discovered a ♂ with as many as 34 spines, but here I have taken both the small and large ones into consideration. (fig. 23) In Janmoulle's (1959) fig. 3 there are 15 spines. The variation is too great, I think, to justify any specific separation between the American and the European forms.

H. mucidella is distributed over an extensive area in both North and South America from Canada to Argentina. In Europe it is reported from Spain, France, Belgium, Holland, Germany, Italy, Austria and the Scandinavian countries.

* Duponchel's type specimens still exist in the Museum Naturel de Paris. Type locality not known.

H. saxicola Vaughan, 1870

This species was found new to Norway by A. Nielsen in 1955 at Vig and Orre in Klepp (Ry), where it occurs commonly in the latter half of July. The Z. M., (Oslo) received about 20 specimens of *H. saxicola* as a gift from A. and T. Nielsen.

Heinrich (l.c. p. 225) has erected a new genus *Rotruda* for *H. mucidella* (incl. *H. pseudonimbella*), because both the male and female genitalia differ strikingly from those of the other American species of *Homoeosoma*. However, in *H. saxicola* we have a connecting link between the two genera, as the male genitalia is of the *Homoeosoma*-type while the female genitalia, in particular the bursa, is quite like the *Rotruda* species with strongly spined and concave plates. *In H. saxicola* the spines are considerably longer than they are in *H. mucidella*. It would be better to treat *Rotruda* Heinr. as a synonym of *Homoeosoma* Curt.

H. saxicola was originally described from England, but seems to have a fairly large distribution as it now has been discovered in Scandinavia, Finland, Holland, Belgium and Germany. In the Z. M. (Oslo) collections there are also specimens from Taormina and Messina (Esmark leg., 1849—50), and from Haifa (5 specimens, v. Kalchberg leg., E. Strand coll.).

Zophodia Hübner, 1825

(Type of genus: *Z. convolutella* (Hübner, 1796))

Z. convolutella (Hübner, 1796)

The species is a well-known pest on *Ribes*, the larva feeding on the unripe berries. The majority of the records below, I have obtained from the Norwegian Plant Protection Institute, Division of Entomology, Vollebekk (SPV).

Distribution:

Ø: Jeløy, Skjeberg, Askim, Mysen, Øymark (SPV); AK: Spro, 4 specimens 1913 to 1927 (Haanshus), Sandvika, 3 specimens May 15th 1934 (Barca), Asker, Ås, Hvidsten, Ullensaker, Årnes, Høland (SPV); HEs: Blestad in Vang, Hamar (SPV); Bø: Norderhov, 7 larvae, imagines April 1891 (Schøyen), Lier Kongsberg (SPV); VE: Nevlunghavn, 3 specimens May 28th 1911 (Barca), Holmestrand, Horten, Tjøme, Sandar, Sandefjord, Tjølling (SPV); TEy: Kragerø May 15th 1892 (Ullmann), Porsgrunn (SPV); TEi: Nissedal, Treungen (SPV); AAy: Laget June 10th 1924 (Knaben), Risør (Thorstensen); VAy: Kristiansand (SPV).

Euzophera Zeller, 1867

(Type of genus: *E. cinerosella* (Zeller, 1839))

E. terebrella (Zincken, 1818)

"The larva feeds in the cones of spruce (*Picea abies*) from September to June, eating the seeds. Infested cones are stunted

and aborted and fall from the tree before attaining full growth. The larva apparently takes two years to become full-grown." "It pupates in a slight cocoon within the cone." (Beirne 1954, p. 104). The damage seems to be very slight, so the species is not considered a pest in Norway.

Distribution:

Ø: Rauer July 5th and 21st 1920 (Barca); AK: Sandvika July 25th 1928, August 1933, July 30th 1934 (Barca), Spro July 15th 1923, July 23rd and August 17th 1927 (Haanshus); HEs: Hovelsrud in Helgøy, larvae bred from cones, July 11th 1849 (Esmark) (Schøyen 1885); AAy: Tromøy, 2 specimens July 2nd 1957, 1 ♀ July 22nd 1958 (Bakke).

Nyctegretis Zeller, 1848

(Type of genus: *N. achatinella* (Hübner, 1823—27))

N. achatinella (Hübner, 1823—27)

The species has only been found in AAy, where J. & N. Knaben captured one ♂ on August 12th 1924 at Laget. A second ♂ was taken some years later at Tromøy on July 29th 1957 by A. Bakke. The larva lives in a tube, on the roots of different plants, like *Ononis, Trifolium, Artemisia campestris.*

Ancylosis Zeller, 1839

(Type of genus: *A. cinnamomella* (Duponchel, 1836)

A. cinnamomella (Duponchel, 1836)

The species seems to be confined to the Oslofjord district:

Ø: Rauer June 6th and August 16th 1922 (Barca); AK: Oslo 1849—1853, 13 specimens (Esmark), Grønlia June 6th 1847 (Siebke), V. Aker June 13th and 19th 1876 (Sparre Schneider) Aker (Schøyen), Ostøya June 15th 1960 (Opheim); Bø: Tofteholmen in Hurum May 16th 1912 (Rygge).

The larva feeds on *Globularia* and probably other plants.

Plodia Guénée, 1845

(Type of genus: *P. interpunctella* (Hübner, 1810—1813))

P. interpunctella (Hübner, 1810—1813)

This species and the following 3 are warehouse pests (see Sømme 1959, 1962). *P. interpunctella* is only known from AK: Oslo.

Anagasta Heinrich, 1956

(Type of genus: *A. kühniella* (Zeller, 1879))

A. kühniella (Zeller, 1879)

According to Sømme (1962) this flour-mill moth is found in all the districts in Southern Norway, except HEn, TEi, AAi, VAi, Ri, HOi, SFi, STy and NTy.

Ephestia Guénée, 1845

(Type of genus: *E. elutella* (Hübner, 1796))

E elutella (Hübner, 1796)

In Norway the "Cocoa Moth" has been observed in warehouses and factories in the following districts: AK, TEy, VAy and HOy (Sømme 1962). But it occurs also out-of-doors, as reported from:

Ø: Sarpsborg, Rauer (Barca); AK: Oslo (Esmark, Schøyen, Haanshus), Sandvika, Nordstrandshøgda (Barca), Spro (Haanshus); TEy: Jomfruland July 16th and 18th 1963, several specimens found resting on the walls of the Jomfruland farm (Opheim); AAy: Laget (Knaben); VAy: Sireosen, VAi: Sirdal (E. Strand); Ri: Erfjord (Strand); HOi: Voss (Grønlien), Ullensvang 1962 (Edland); Utne July 13th 1909 (Barca).

In one specimen from Ullensvang (Edland leg.) veins 2 and 3 of the left hind-wing, were stalked half their length, leaving 5 free.

Cadra Walker, 1864

(Type of genus: *C. cautella* (Walker, 1863))

C. cautella (Walker, 1863)

Sømme (1959) mentions this pest from Oslo and Bergen only.

Anerastiinae

Anerastia Hübner, 1825

(Type of genus: *A. lotella* (Hübner, 1811—17))

A. lotella (Hübner, 1811—17)

The species is confined to coastal sandhills, and was found new to Norway on July 12th 1952 at Ry: Orre in Klepp by the ardent student of Lepidoptera of Jæren, A. Nielsen. It has been collected by him almost every year up to 1961 at Orre, but has also been taken at Ry: Dale in Hetland and VAy: Lista. First date is July 9th, and 31st the last day of capture. Outside this area a ♂ was found at AAy: Tromøy on June 29th 1957 (A. Bakke) and at TEy: Jomfruland on July 18th 1963 (Opheim). The larva feeds on *Psamma arenaria* and other grasses, and can occasionally cause serious damage to rye.

Summary

33 species of the Phycitidae are now known to occur in Norway. The number is small in comparison with the 58 Swedish species, so there is good reason to expect a considerable increase in the number of species in Norway in the future if only collectors would pay more attention to this interesting family.

The list contains one species new to science: *Catastia kistrandella* sp. nov. Type locality: Norway, Kistrand.

Salebria betulae (Deg.) is removed to *Ortholepis* Rag. and *Homoeosoma pseudonimbella* Bent. is considered a synonym of *Homoeosoma mucidella* Rag.

The following 8 species have not before been published from Norway: *Acrobasis sodalella* Zell., *Pima boisduvaliella* (Gn.), *Catastia kistrandella* sp. n., *Nephopteryx hostilis* (Steph.), *Phycita spissicella* (Fab.), *Homoeosoma mucidella* Rag., *H. saxicola* Vaugh., *Anerastia lotella* (Hb.).

Three species are deleted from the Norwegian list: *Hypochalcia lignella* Hb., *Asarta aethiopella* (Dup.), *Homoeosoma nimbella* Dup.

Districts of Norway (According to A. Strand in Norsk Ent. Tidsskr. VI: 208—224, 1943). Abbreviations used in the paper:

Ø = Østfold	R = Rogaland
AK = Akershus (incl. Oslo)	HO = Hordaland (incl. Bergen)
HE = Hedmark	SF = Sogn og Fjordane
O = Opland	MR = Møre og Romsdal
B = Buskerud	ST = Sør-Trøndelag
VE = Vestfold	NT = Nord-Trøndelag
TE = Telemark	N = Nordland
AA = Aust-Agder	TR = Troms
VA = Vest-Agder	F = Finnmark

i = inner, y = outer, n = northern, s = southern, v = western and ø = eastern.

References

BAKKE, A., 1959: Utbredelsen av slekten Dioryctria Zell. i Norge. — Norsk Ent. Tidsskr. 11, pp. 23—30.

BARCA, E., 1922: Seltene norwegische Schmetterlinge. — Ent. Tidskr. 42, pp. 33—40.

— 1923: Østfolds (Smaalenenes) lepidopterfauna II. — Norsk Ent. Tidsskr. 1, pp. 216—234.

BEIRNE, B. P., 1954: British Pyralid and Plume Moths. — London & New York.

BENANDER, P., 1940: Revision von Zetterstedts lappländischen Microlepidoptera. — Opusc. Ent. 5, pp. 49—65.

— 1946: Förteckning over Sveriges småfjärilar. Cat. Ins. Suec. VI. — Ibid. 11, pp. 1—82.

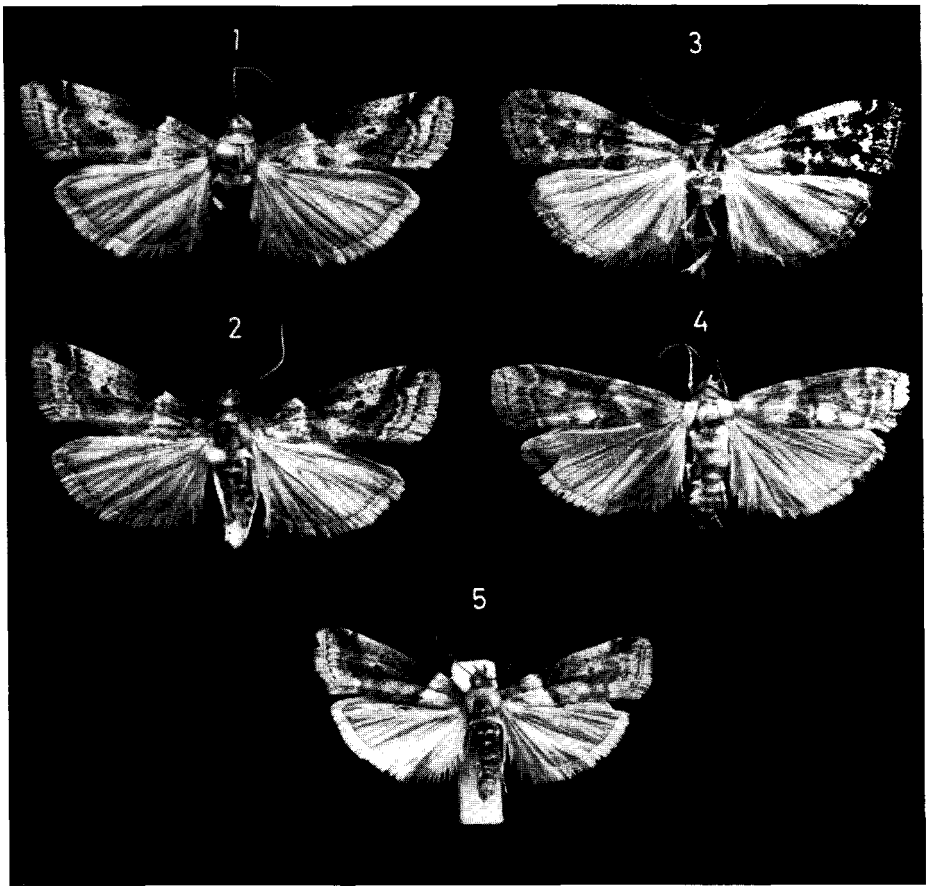
— 1953: Cat. Ins. Suec. VI. Additamenta. Microlepidoptera. — Ibid 18, pp. 89—101.

DEURS, W. v., 1942: Sommerfugle VI, Pyralider. — Danmarks Fauna 48. København.

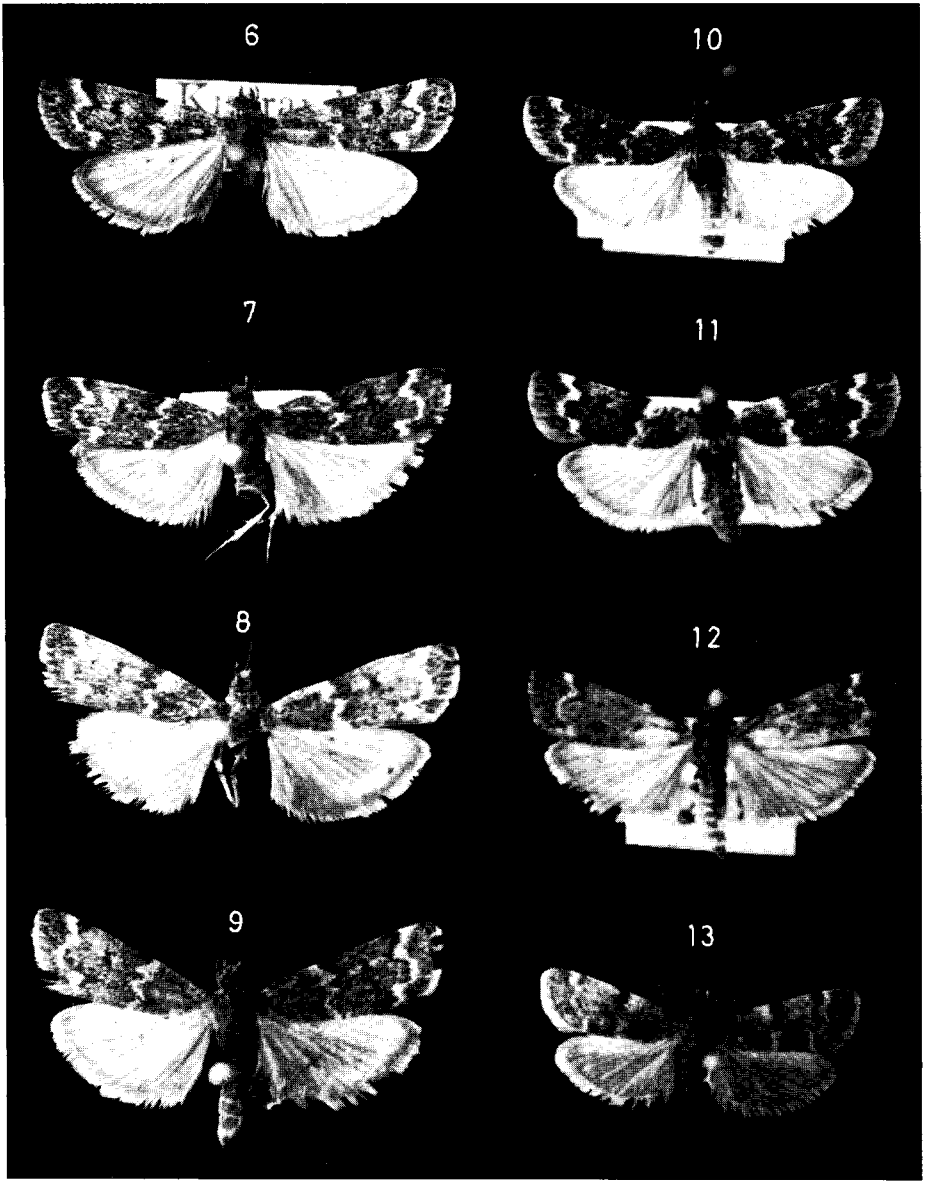
GRØNLIEN, N., 1925: Mikrolepidoptera fra Voss og Indre-Hardanger etc. — Norsk Ent. Tidsskr. 2, pp. 39—52.

HAANSHUS, K., 1933: Fortegnelse over Norges Lepidoptera. — Ibid. 3, pp. 165—216.

HEINRICH, C., 1956: American Moths of the Subfamily Phycitinae. — Washington.
JANMOULLE, E. 1959: Notes sur les Microlepidopteres de Belgique V. — Inst. royal des Sciences nat. de Belgique 35, No. 27, pp. 1—32.
LIE-PETTERSEN, O. J., 1897: Lepidoptera iagttagne i Lærdal sommeren 1897. — Berg. Mus. Aarb. 1897, No. 13, pp. 1—29.
LUNDETRÆ, O. B., 1939: Beitrag zur Kenntnis der westnorwegischen Schmetterlingsfauna. — Ibid. 1938. Naturv. rekke, nr. 10, pp. 1—15.
PIERCE, F. N. & METCALFE, J. W., 1938: The genitalia of the British Pyrales etc. — Oundle, Northants.
RAGONOT, E. L., 1893: Monographie des Phycitinae et des Galleriinae. — Mem. sur les Lépidopt. VII. Saint-Pétersbourg.
— 1901. — Ibid. VIII. Saint-Pétersbourg.
SCHØYEN, W. M., 1887: Yderligere Tillæg til Norges Lepidopterfauna. Christ. Vid. Selsk. Forh. 1887, Nr. 3, pp. 1—32.
— 1893: Fortegnelse over Norges Lepidoptera. Ibid. 1893, Nr. 13, pp. 1—54.
SPARRE SCHNEIDER, J., 1876: In Siebke, Enumeratio insectorum Norvegicorum III, Cat. Lep. Norv. Christiania.
— 1893: Lepidopterfaunaen paa Tromsø og i nærmeste omegn. Tromsø Mus. Aarsh. 15, pp. 1—156.
— 1907: Saltdalens Lepidopterfauna, 2:det Bidrag. Ibid. 28, pp. 103—162.
STAUDINGER, O. & REBEL, H. 1901: Catalog der Lepidopteren des palaearctischen Faunengebietes. Berlin.
SØMME, L., 1959: Ephestia cautella (Wlkr.) new to Norway. Norsk Ent. Tidsskr. 11, pp. 20—21.
— 1962: A survey of Coleoptera and Lepidoptera of stored products in Norway. Ibid. 12, pp. 1—10.
Tromsø Museums Aarsberetninger 1889, 1890 and 1891.
WALLENGREN, H. D. J., 1871: Skandinaviens Pyralider och Choreutider. Öfvers. af K. Vet.-Akad. Forh. 1871, N:o 8, pp. 961—1060.
WOLFF, N. L., 1959: Bemærkninger om nogle danske Pyralider. Flora og Fauna 65, pp. 113—133.
ZETTERSTEDT, J. W., 1840: Insecta Lapponica. Lipsiae.



Figs. 1—2. *Acrobasis sodalella* Zell. ♂♂, Laget, 9.VII.28 Norway (J. & N. Knaben leg., coll. Z. M. Bergen). Fig. 3. *Nephopteryx hostilis* (Steph.) ♀, Ølene, Bornholm, Denmark, 28.VI.58 (N. L. Wolff leg.). Fig. 4. *Phycita spissicella* (Fab.) ♀, Laget, Norway 12.VII.22 (J. & N. Knaben, coll. Z. M. Bergen). Fig. 5. *Acrobasis consociella* (Hb.), ♂, Germany (ex coll. Hinneberg, coll. Z. M. Oslo). × 2,6 N. Knaben phot.



Figs. 6—12. *Catastia kistrandella* sp. nov. 6. ♂, Kistrand, Norway, holotype (coll. Z. M. Tromsø). 7—9. ♂♂, (?) Porsanger VII. 1907, (T. H. Schøyen leg. coll. Z. M. Oslo). 10, 11. ♂, ♀ Malla alp., Fennia 2.VII.36 (Lankiala leg., coll. Z. M. Helsinki). 12. ♂, Malla 3.VII.34 (Karvonen leg., coll. Z. M. Helsinki). Fig. 13. *Asarta aethiopella* Dup. ♂, Glockner, Austria (coll. Z. M. Oslo). × 2,6. N. Knaben phot.

M. Opheim

Koleopterologiske notater

Av Anders Vik, Sandefjord

Jeg har gjennomgått min billesamling etter å ha anskaffet Catalogus Coleopterorum Fennoscandiae et Daniae 1960. Det viser seg at en del av mine funn, utenom dem Andreas Strand har tatt med i sine arbeider, er av faunistisk interesse og bør publiseres. Nedenstående arter er nye fra følgende områder: Elverum (HES), Onsøy (Ø) og Sandefjord og Sandar (VE).

Andreas Strand har velvillig kontrollert materialet, og jeg takker ham varmt for dette.

Nye arter for Norge er merket *

Nebria brevicollis F. Sandar (VE) 20/6—58, ved en rå og skyggefull avfallsplass. *Trechus rubens* F. Sandar (VE) 28/10—61, flomrusk. *Licinus depressus* Payk. Sandar (VE), 6/9—58, under stein. *Amara eurynota* Panz. Sandar (VE), 19/6—58. *A. ovata* Fbr. Onsøy (Ø), 23/5—57, gårdstun. *Lebia crux-minor* L. Sandefjord (VE) 7/6—58, eng. *Hydroporus melanocephalus* Mrsh. Elverum (HES) 1951. *Ochthebius bicolon* Germ. Sandar (VE) 28/10 61, flomrusk. *Cercyon terminatus* Mrsh. Sandefj. (VE) 21/11—57, kompost. *Megasternum boletophagum* Mrsh. Sandar (VE) 28/10—61, flomrusk. *Laccobius striatulus* F. Sandar (VE) 28/10—61, flomrusk. *Catops dorni Reitt.* Onsøy (Ø) ett eksemplar 1956 og Sandefj. (VE) ett eksemplar sept.—59 i dikekant langs vei. *Agathidium varians* Beck. Sandar (VE) 28/10—61, flomrusk. *Scydmaenus tarsatus* Müll. Sandefj. (VE) 28/9—61, gresshaug. *Acrotrichis rugulosa* Rossk. Sandar (VE) 28/10—61, flomrusk. *Megarthrus denticollis* Beck. Sandefj. (VE) 19/9—57, kompost. *M. fennicus* Laht. Elverum (HES) 23/7—53, sopp. *Omalium excavatum* Steph. Sandefj. (VE) 19/9—57. kompost. *O. exiguum* Gyll. Sandar (VE) 28/9—61, flomrusk. *Xylodromus depressus* Gr. Sandefj. (VE) 30/8—57, vinduskarm. *Olophrum fuscum* Gr. Sandar (VE) 28/10—61, flomrusk. *Platystethus alutaceus* Th. Sandar (VE) 29/9—59, under vissent løv. *Bledius fracticornis* Payk. Sandar (VE) mai—58. *Stilicus orbiculatus* Payk. Sandar 28/9—61, gresshaug. *Medon nigriceps* Kr. Sandar 28/9—61, gresshaug. *Leptacinus intermedius* Donist. Sandar (VE) 28/10—61, flomrusk. *Xantholinus strandi* Coiff. Sandar (VE) 28/10—61, flomrusk. *Philonthus nitidus* F. Sandefj. (VE) 19/9—57, kompost. *P. rectangulus* Sharp. Sandefjord (VE) 19/9—57, kompost. *P. subnigritulus* Reitt. Sandar (VE) 28/10—61, flomrusk. *P. velox* Sharp. Sandar (VE) 29/9—57, under eikeløv. *Trichophya pilicornis* Gyll. Elverum (HES) mai—53. *Bolitobius lunulatus* L. Sandefj. (VE) juli—54, under råtne planter. *Tachyporus corpulentus* J. Sahlb. Elverum (HES) juli—52. *Tachinus laticollis* Gr. Sandefj. (VE) juli—54, kompost. *Leucoparyphus silphoides* L. Sandar (VE) 17/7—58. *Oligota inflata* Mnh. Onsøy (Ø) 27/4—57, Sandar (VE) 28/9—61, gresshaug. *Gyrophaena fasciata* Mrsh. Sandar

(VE) 28/10—61, flomrusk. *Autalia rivularis* Gr. Sandefj. (VE) 19/9—59 kompost. *Atheta* (*Philhygra*) *britteni* Joy. Sandar (VE) 28/10—61 i antall i flomrusk. *Ath.* (*Dimetrota*) *cinnamoptera* Th. Sandar (VE) 28/10—61, flomrusk. *Ath. Atheta* (s. str.) *coraria* Kr. Sandar (VE) 28/10—61, flomrusk. *Ath.* (*Atheta* s. str.) *gagatina* Baudi. Sandar (VE) 22/9—57, sopp. *Ath.* (*Aloconota*) *gregaria* Er. Sandar (VE) 28/10—61, flomrusk. *Ath.* (*Dimetrota*) *hercynica-islandica.* ♀♀ av denne artsgruppen har jeg fra Elverum (HES), Onsøy (Ø) og Sandar (VE). I flomruskmateriale 28/10—61 fant jeg 14 individer, og alle var ♀♀. *Ath.* (*Dimetrota*) *ischnocera* Th. Sandar (VE) 15/10—59, i kugjødsel. *Ath.* (*Dimetrota*) *marcida* Er. Sandar (VE) 29/9—57, sopp. *Ath.* (*Dimotrota*) *nigripes* Th. Sandefj. (VE) 19/9—57, kompost. *Ath.* (*Dimotrota*) *setigera* Sharp. Sandar (VE) 15/10—57, kugjødsel. *Ath.* (*Acrotona*) *laticollis* Steph. Sandefj. (VE) 19/9—57, kompost. *Ath.* (*Acrotona*) *sordida* Marsh. Elverum (HES) mai —53. *Ath.* (*Datomicra*) *nigra* Kr. Elverum (HES) juli—53. *Ath.* (*Atheta* s. str.) *xanthopus* Th. Sandar (VE) 28/10—61, flomrusk. *Zyras limbatus* Payk. Elverum (HES) 18/5—53, ved bekk. *Oxypoda funebris* Kr. Sandar (VE) 28/10—61, flomrusk. *Ox. exoleta* Er. Sandar (VE) 28/10—61, flomrusk. *Tinotus morion* Grav. Sandefj. (VE) 19/9—57, kompost. *Aleochara lygaea* Kr. Onsøy (Ø) 18/8—54, kompost. *A. obscurella* Gr. Sandar (VE) 2/9—61, under tang. *Gnathoncus buyssoni* Auzat Sandar (VE) 20/6—62, fuglereir. *Hylecoetus dermestoides* L. Onsøy (Ø) 2/6—55, i flukt. *Hypnoidus consobrinus* Muls., Guill. Elverum (HES) 11/5—52. *Throscus carinifrons* Bonv. Sandar (VE) 30/9—62, hyttetomt. *Cyphon coarctatus* Payk. Elverum (HES) 23/6—52, ved bekk. *Simplocaria semistriata* F. Sandar (VE 28/10—61, flomrusk. *Nemosoma elongatum* L. Sandar (VE) 28/10—61, flomrusk. *Cychramus 4-punctatus* Hbst. Sandar (VE) 22/9—57, sopp. *Rhizophagus parvulus* Payk. Sandar (VE) 28/10—61, flomrusk. *Monotoma brevicollis* Aubé Sandefj. (VE) 28/9—61, gresshaug. *M. longicollis* Gyll. Sandefj. (VE) 28/9—61, gresshaug. *Cryptophagus saginatus* Sturm. Sandefj. (VE) 1/4—62, kjeller. *Antherophagus nigricornis* F. Sandefj. (VE) 1960. *Atomaria berolinensis* Kr. Sandar (VE) 28/10—61, flomrusk. *A. fuscata* Schnh. Sandefj. (VE) 1959, gresshaug. *A. impressa* Er. Sandar (VE) 28/10—61, flomrusk. *A. wollastoni* Sharp. Sandar (VE) 28/10—61, flomrusk. *A. zetterstedti* Zett. Sandar (VE) 28/10—61, flomrusk. *Olibrus aeneus* F. Sandar (VE) 28/10—61, flomrusk. *Lathridius bergrothi* Rtt. Sandefj. (VE) 1/4—62, kjeller. *L. lardarius* DeG. Sandar (VE) 30/9—61, under løv. *Aspidiphorus orbiculatus* Gyll. Sandar (VE) 28/10—61, flomrusk. *Rabocerus gabrieli* Gerh. Sandar (VE) 28/10—61, flomrusk. *Anthicus floralis* L. Sandefj. (VE) 28/9—61, gresshaug. **Apalus bimaculatus* L. Av denne arten som er ny for landet, fant jeg et dødt eksemplar ved strandkant i mai—58. Sandar (VE). *Tribolium confusum* DuV. Sandefj. (VE) 25/4—58, kjøkkenskap. *Tribolium destructor* Uytt. Sandefj. (VE) høsten —59, kjøkken. *Aphodius merdarius* F. Sandar (VE) 28/10—61, flomrusk. *A. nemoralis* Er. Elverum (HES) 27/5—51, beitemark. *A. prodromus* Brahm. Sandar (VE) 28/10—61, flomrusk. *Aromia moschata* L. Sandar (VE), funnet av Leif Lønne 1960. *Clytus arietis* L. Sandefj. (VE) mars—58, ved morken stubbe av lønn. *Chrysomela marginata* L. Sandar (VE) 28/10—61, flomrusk. *Apion violaceum* Kby. Sandefj. (VE) 20/7—58, eng. *Trachyphloeus aristatus* Gyll. Sandefj. (VE) 28/9—61, gresshaug. *Barypithes pellucidus* Boh. Sandefj. (VE) juni—61. *Sitona flavescens* Mrsh. Sandefj. (VE) 1959, gresshaug. *Phytonomus adspersus* F. Sandar (VE) 28/10—61, flomrusk. *Phytonomus elongatus* Payk. Sandefj. (VE) 29/7—58, eng. *Rhinoncus gramineus* F. Sandefj. (VE) 29/7—58, eng. *Amalus haemorrhous* Hbst. Sandefj. (VE) juli—58, gresshaug. *Rhynchaenus decoratus* Germ. Sandar (VE) 28/10—61, flomrusk. **Pityophthorus glabratus* Eichh. Av denne arten som er ny for landet, fant jeg et eksemplar i Elverum (HES) mai 1952.

Abnormitet hos *Ameletus inopinatus* Etn. (Ephemeroptera)

Av Gisle Grimeland, Oslo

Våren 1962 gikk jeg gjennom en del materiale av døgnfluer utlånt fra Det kongelige norske videnskabers selskab, Museet, Trondheim. Alt var innsamlet av Liv Rustad i Nord-Norge sommeren 1961. Blant forskjellige arter kom jeg over et individ av arten *Ameletus inopinatus* Etn. fra Ifjord, coll.: Liv Rustad 26/7 — 1961, med abnormt utviklet 9. sternum. Dette fenomenet syntes å være så interessant at det var verdt en nærmere undersøkelse.

Når det gjelder abnormitet hos døgnfluer, skriver Tiensuu (1937: 217): «Among mayflies cases of anomaly seems to be rather rare. It is only during the last years that some gynandromorphic and intersexual individuals have been described. They all belongs to the species *Baetis rhodani* Pict.»

I tillegg til dette har Tiensuu (1937) beskrevet følgende fem abnorme individer av døgnfluer fra Finland: *Baetis scambus* Etn. med små turbanøyne, interseksuell imago av *Baetis* sp. (?*bioculatus* L.) og *Cloeon praetextum* Bengt., et tilfelle av hypertrofi av de hannlige karakterer hos *Leptophlebia marginata* L., manglende tverr-ribber i vingene hos *Heptagenia sulphurea* Müll. Det siste tilfellet sammenlignes med en mutasjon, «crossveinless», som forekommer hos *Drosophila melanogaster.*

Så har Landa (1949) beskrevet et tilfelle av gynandromorfi hos *Baetis bioculatus* L. Det beskrevne individ var asymetrisk og høyre siden lignet hunnen mens venstre siden lignet hannen. De hannlige kjønnsorganer syntes dessuten å være normalt utviklet. Berner (1949) har beskrevet følgende tilfeller av gynadromorfi: *Pseudocloeon* sp. og *Heterocloeon curiosum.* Begge er asymetrisk med hannlige karakterer til ene siden og hunnlige

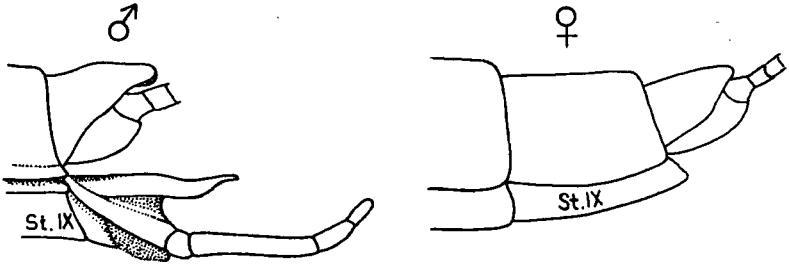


Fig. 1

Fig. 1. Til venstre: *A. inopinatus* Etn. ♂ (etter Ulmer 1929). Til høyre: ♀ av samme art.

karakterer til andre siden. Dessuten har Berner (1957) beskrevet et tilfelle av gynadromorfi hos *Hexagenia munda elegans*. Individet er asymetrisk med hensyn til kjønnsorganene. Øynene ligner hunnens.

Det eneste man kan finne om abnormiteter hos *Ameletus inopinatus* Etn., er en liten notis etter Bengtson (1928: 13). Han har funnet denne arten i Lille Ruostavand 4/7 — 1922, «1♀ im., (monstrøs mit derformiertem Forceps!)».

Det individ som skal omtales her vil man ved første øyekast si er en hunn. Den mangler turbanøyne, og fargen på thorax og abdomen er som hos hunnen. Abdomen er dessuten fylt med egg til 8. sternum (fig. 2), og disse synes å være normalt utviklet, (Sml. Bengtson 1913). Det har også normalt utviklet subgenitalplate på 7. sternum. Det som avviker fra en normal hunn er følgende: 9. sternum er tydelig forlenget på hver side. Hjørnene løper ut i hver sin spiss, så de danner tilsammen en gripeklo (fig. 2). Denne kan sammenlignes med hannens forceps (fig. 1), men er ikke leddet. 9. sternum blir på grunn av dette ca. 75% lengre enn normalt (fig. 1). Mellom 9. sternum og 10. abdominalledd kan man se et organ som i form svarer til hannens penis, men er noe mindre (fig. 2).

Abnormiteten i dette tilfelle består i at individet har delvis utviklete hannlige kjønnsorganer. Det er verdt å merke seg at de hannlige karakterer er begrenset til 9. sternum og til utforming av penis. Ut fra det kan fenomenet betraktes som gynadromorfi, og individet må betegnes som en *Ameletus inopinatus* hunn, med utpregete hannlige kjønnskarakterer. Grunnen til fenomenet kan trolig tilskrives forstyrrelser i XX—XY mekanismen (Sml. Tiensuu 1937).

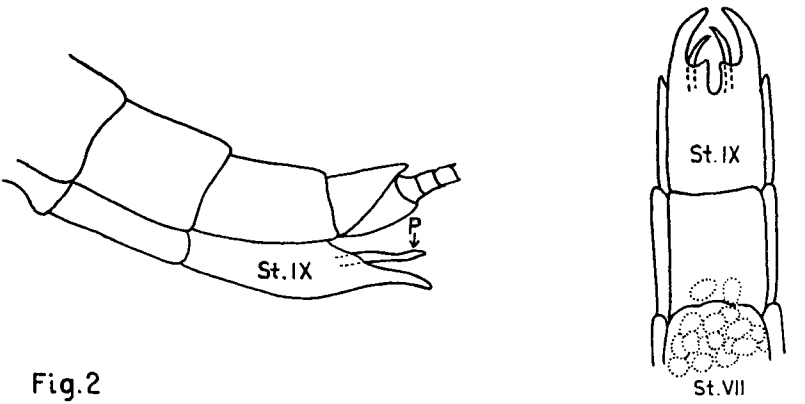


Fig. 2. *A. inopinatus* Etn., coll. Liv Rustad 26/7 — 1961. (St. IX = 9. sternum, St. VII = 7. sternum, p = penis).

Videre undersøkelser på dette område vil sannsynlig vise at abnormiteter hos døgnfluer ikke er så helt sjelden som enkelte forskere hevder.

Summary

The individual of *Ameletes inopiatus* Etn. described, is in most characteristics similar to the female. It has lateral eyes only and its abdomen is broad and opaque and filled with eggs. The difference is as follows: The 9th sternite is about 75% longer than that of the normal female, and it is formed as a clasper but is unsegmented (fig. 2). Further, there is a penis between the 9th sternite and the 10th abdominal segment. The phenomenon may in this case be a question of gynadromorphy due to a disturbance of the XX—XY mechanism.

Litteratur

BENGTSON, S., 1913: Undersøkingar øfver Äggen hos Ephemeriderna. — Ent. Tidskr. 34: 20—22.

— 1928: Beitrag zur Kenntnis der Ephemeropteren des nördlichen Norwegen. — Tromsø Mus. Årsh. 51 (2): 13.

BERNER, L., 1949: A report on two mayfly gynadromorphs. — The Florida Entomologist XXXII (3): 105—109.

— 1957: A mayfly gynadromorph. — Proc. Ent. Soc. Wash. 59 (4): 167—169.

LANDA, V., 1949: Contribution to the question of gynadromorphism in Ephemeroptera. (With a description of the gynandromorph *Baetis bioculatus* L.). — Věstnìc Čls. zoolõgìcke spõlěcnõsti. Sv. 13, r.: 272—279.

TIENSUU, L., 1937: Anomalous Mayfly Individuals (Ephemerida). — Ann. Ent. Fenn. 4: 217—223.

ULMER, G., 1929: Tierwelt Mitteleuropas. IV. (Eintagsfliegen) — Leipzig.

Rov-vepser (Hym., Sphegidae) i *Grynobius*-ganger i naust på Sunnmøre

Av R. Lyngnes, Løvik, Sunnmøre

En solskinnsdag i slutten av juli 1960 la jeg merke til at noen insekter kom flygende og krøp inn gjennom flyhuller som *Grynobius* hadde laget på reisverk og sperre-ender som vendte ut mot det fri i naustet ved sjøen på Lyngnes.

Dyrene ble fanget, og viste seg å være vepser av størrelse så vidt de kunne passere flyhullene (fig. 1). De krøp alltid inn i gangen med hodet foran, men når de etter en tid, fra noen sekunder og opptil 1/4 time, kom ut igjen hadde de som regel hodet utover i gangen.

Vepsene ble sendt til Dr. Hellén i Helsingfors til bestemmelse, og han fant i materialet to arter rov-veps: *Rhopalum clavipes* L. og *Hoplocrabro 4-maculatus* F.

Med skylp og hammer lykkedes det å ta ut sylinderformete søyler med et stykke av *Grynobius*-gangen liggende i midten, slik at innholdet i gangen kunne observeres fra flyhullet og flere sentimeter innover. Det viste seg da at i ganger hvor vepsene ofte hadde fløyet inn og ut var der en større samling bladlus og lenger inne ett eller flere kokongliknende dannelser. Friske bladlus på forskjellig utviklingstrinn, uten — og med vinger, var lagt sammen i hauger i gangen. De fleste var levende, men delvis lammet, uten evne til å flytte på seg. Antallet av bladlus i gangene kunne variere fra 16 til 63. I bladlushaugene var det som regel bare *en* vepselarve (fig. 2, øverst) som med stor grådighet og livlige hodebevegelser lot de lange, totannete mandibler ustanselig skjære seg inn i de levende bladlus.

I gangene hvor den brune *R. clavipes* krøp inn og ut var vepselarven lys, mens i gangene hvor den svarte *H. 4-maculatus* hadde vært, var larven gråfarget. Begge larvearter vokste hurtig. Adlerz (1903) nevner at *H. 4-maculatus* kan samle mygg og fluer til vertsdyr for sine unger og at *R. clavipes* ifølge G. C. Nielsen samler fluer til sitt avkom.

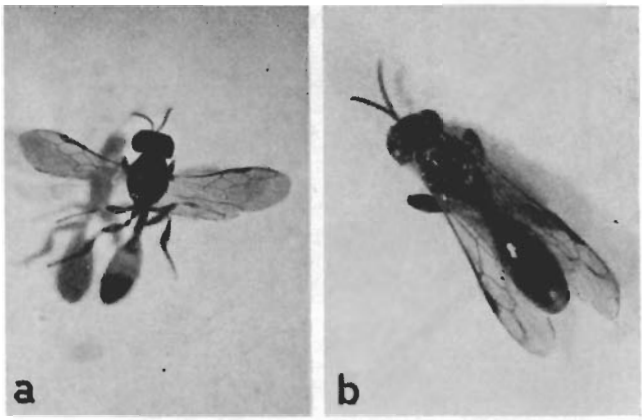


Fig. 1. a: ***Rhopalum clavipes*** L.; b: *Hoplocrabro* ***4-maculatus*** F.

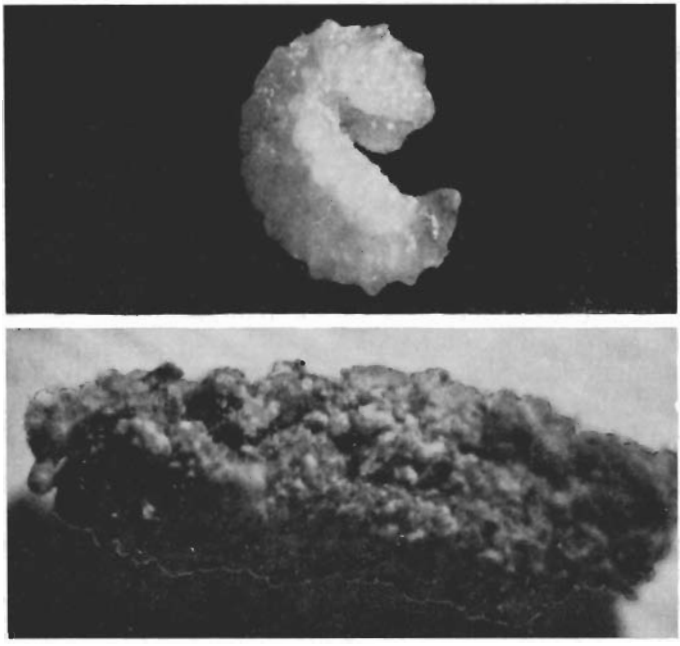


Fig. 2. ***Rhopalum clavipes*** L. Øverst: Larve funnet i *Grynobius*-gang. Nederst: Kokong fra en *Grynobius*-gang.

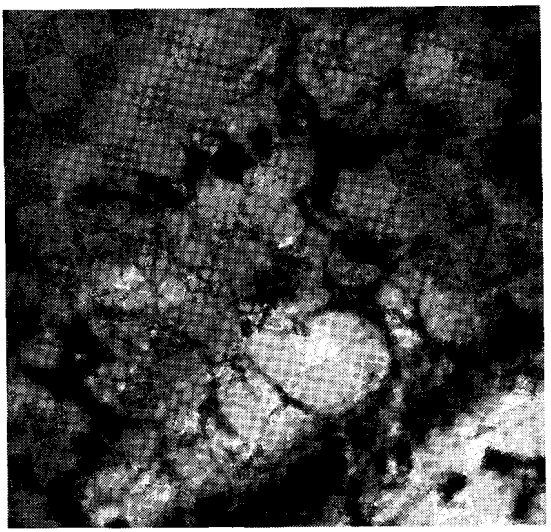


Fig. 3. Del av kokongveggen med tynntrådete, finere masker og grovtrådete store masker på et tidlig byggetrinn hos *R. clavipes* L.

På solskinnsdager var flygende rov-vepser å se ved naustveggen til slutten av september. Det viste seg at vepser som lette etter flyhuller ofte til å begynne med kunne forveksle disse med mørke punkter på veggen. Naustveggen hadde i sin tid vært prøveskive for hagl-gevær, og rett som det var ble vepser narret til å fly inn på disse mørke haglene som så vidt lå innenfor veggflatens plan.

Vepser som hadde funnet en passende *Grynobius*-gang orienterte seg senere lett tilbake til denne gangen. Bladlusene ble tatt av vepsene på blad av hassel, or, bjørk, rogn, hegg og selje som sto i en skråning ved naustet.

Innenfor bladlushaugene i *Grynobius*-gangene fant jeg som regel én eller flere 5—7 mm lange, ovale dannelser som viste seg å være vepsens kokonger. Disse var utvendig rikelig besatt med tremjølfargede ekskrementer som gjerne fyller gangen bak *Grynobius*-larvene og dessuten med noen mindre, mørke kuleformete legemer (fig. 2, nederst). Disse siste hadde infiltrerte deler av bladlusvinger og var tydelig sammenkittede levninger av kitinholdige bladlusrester. De fleste av kokongene hadde åpning i ene enden og var tomme og jeg kunne ikke avgjøre hvor gamle de var, om de var av samme-, eller av forskjellig årgang. I alle kokongene var i bakre ende en homogen, mørk ekskrementkake.

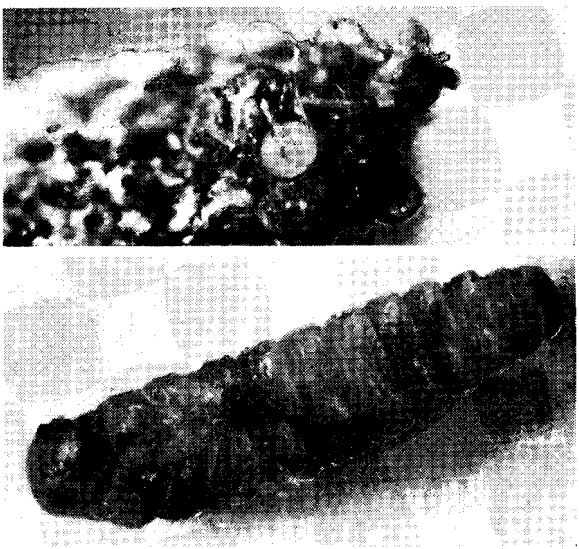


Fig. 4. Øverst: *Grynobius*-egg lagt på veggen av en rov-vepskokong. Nederst: Bladvepslarve fra *Grynobius*-gang (sterkt forstørret).

Kokongene var i høyeste grad solide idet de inn mot den glatte innerside hadde en meget fast og seig vegg som på yttersiden holdt de omtalte fremmedlegemer fast med noe som minnet om sterk, tørket lim.

En vepselarve som gikk til grunne under forpupningen rakk før den døde å lage et sylinderformet nettverk omkring seg fra bakenden og nesten fram til hodet. I det uferdige nettet var det små uregelmessige masker av tynn tråd og utenfor grove masker med tykk tråd (fig. 3) og det var disse maskene som festet fremmedlegemene til kokongen.

En *Grynobius*-hun, som etter kopulationen må ha vandret inn i gangen, hadde lagt et egg på vepsekokongen (fig. 4, øverst). Larven av dette egg gnaget seg gjennom kokongveggen og forsynte seg av vepsepuppen som var halvedt da kokongen noe senere ble klippet opp.

I bladlushopene i *Grynobius*-gangene fant jeg ofte opp til 7 mm lange bladvepslarver (fig. 4, nederst). Disse viste seg å være lammet, og det var da rimelig å anta at rov-vepsene hadde brakt disse inn i gangen til mat for yngelen.

Det kan også tenkes at bladveps-larvene selv hadde søkt inn i *Grynobius*-gangen og at de der var blitt stukket av rov-vepsene.

Jeg hadde håpet å kunne utvide mine observasjoner sommeren 1962, men i det vedvarende våte og kalde været var ingen veps å se ved *Grynobius*-gangene dette året.

Summary

Occasionally the Sphegidae-wasps *Rhopalum clavipes* L. and *Hoplocrabro 4-maculatus* F. choose *Grynobius*-borings as habitations. Both species were found to prey upon Aphids.

Litteratur

ADLERZ, G., 1903: Lefnadsförhållanden och instinkter inom familjerna Pompilidae och Sphegidae. — Stockholm.

Om artsberettigelsen av *Leperisinus orni* Fuchs (Col., Scolytidae)

Av Andreas Strand, Oslo

I sin beskrivelse av *Leperisinus orni* regner Fuchs (1906, s. 51) opp en rekke trekk som skiller denne arten fra den nærstående *fraxini* Panz. Han nevner også at gangsystemet hos de to artene er tydelig forskjellig og at *orni* i motsetning til *fraxini* fortrinnsvis yngler i 2—4 cm tykke greiner. Senere har Nüsslin (1911, s. 273), og ifølge Reitter også Fuchs, påvist at også tyggemagen er forskjellig hos de to artene.

Som det vil sees av nedenstående, har imidlertid enkelte forfattere dradd artsberettigelsen av *orni* i tvil.

Allerede i Reitters katalog (Reitter, 1906, s. 709) er *orni* kommet med, men som ab. til *fraxini*. Noe senere (Reitter, 1913, s. 42) fører han den imidlertid opp som egen art, med den merknaden at den etter ytre karakterer ikke kan skilles fra *fraxini*, men at ifølge Fuchs og Nüsslin skal tyggemagen være annerledes.

Wagner (1914, s. 161) holder avgjort *orni* for en god art. Han har klekket den i store mengder av fingertykke til armtykke askegreiner. På $1^1/_2$—$3^1/_2$ cm tykke greiner var det utelukkende typiske *orni*-gangsystem, mens det på noen armtykke greiner var begge gangsystemer om hverandre (jfr. fig. 1). Dette og den ting at han i det store materiale aldri var i tvil om et dyr var *fraxini* eller *orni*, mener han bestemt taler for at *orni* er en god art.

Künnemann (1919, s. 50) har i en kort notis nevnt at *orni* skiller seg fra *fraxini* også ved at de utstående børstene på sidene av brystskjoldet og dekkvingene er meget kortere hos *orni* enn hos *fraxini*. For brystskjoldet har jeg funnet dette mindre tydelig, men for dekkvingene er det tydelig og i virkeligheten det kjennetegn som er lettest å bruke for å holde artene fra hverandre.

Escherich (1923, s. 479 og 502) har i sin kjente håndbok ført opp *orni* som egen art, men sier at den kan skilles fra *fraxini*

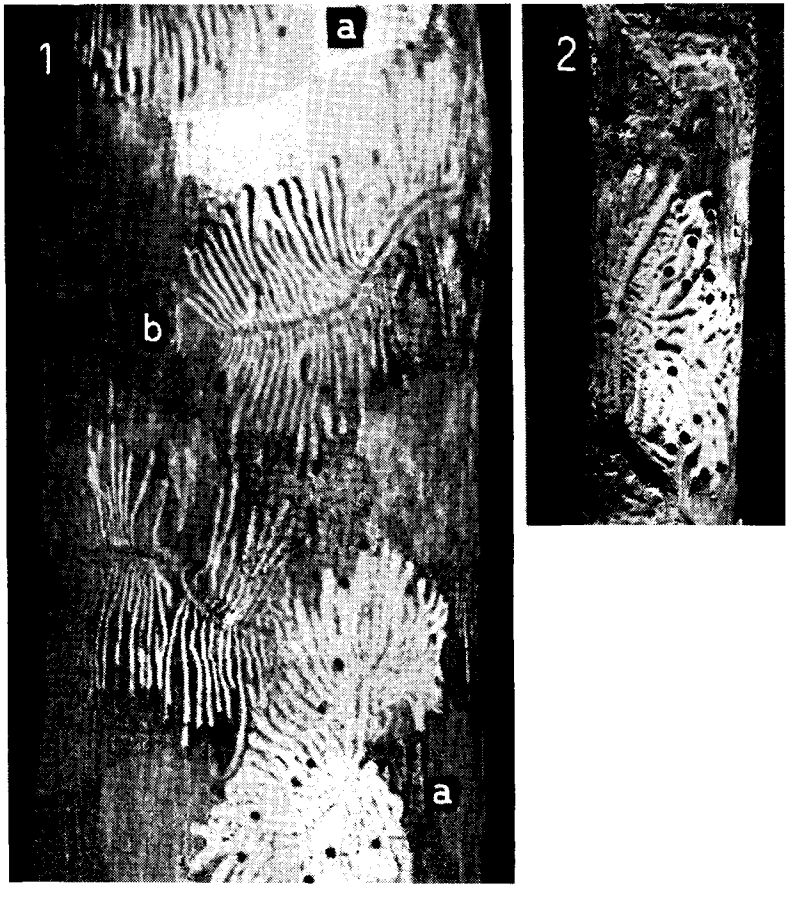


Fig. 1. a) Frassbilder von *Leperisinus orni* Fuchs.
b) Frassbilder von *Leperisinus fraxini* Panz. (Nach Wagner).
Fig. 2. Frassbild von *Leperisinus orni* Fuchs. (Orig.).
Fig. 1 und Fig. 2 von ungefähr gleicher Vergrösserung.

bare etter gangsystemene og indre kjennetegn (med det mener han sikkert tyggemagen), men ikke etter ytre trekk.

J. Sainte-Claire Deville har i en note (Bedel, 1924, s. 147) sagt seg enig i at *orni* er en god art og antyder at Gyllenhals beskrivelse av *fraxini* (Gyllenhal, 1813, s. 345) kan tyde på at han har hatt *orni* for seg, og at utbredelsen av *orni* således skulle strekke seg nordover til S.-Sverige. Grunnlaget for denne an-

tagelse er svakt, men to sørsvenske eksemplarer i Palms samling, som jeg har sett, mener jeg er *orni*.

Sainte-Claire Deville synes senere å ha endret mening, da han i sin katalog over Frankrikes biller (Sainte-Claire Deville, 1938, s. 443) regner *orni* som ssp. til *fraxini*.

Wichmann (1927, s. 56) er ikke i stand til å holde selve billene *fraxini* og *orni* fra hverandre, men han godkjenner *orni* som egen art på grunnlag av gangsystemet og nevner en rekke finnesteder for den i Østerrike.

Simmel (1924, s. 225) har fulgt svermingen av de to artene i løpet av tre år og funnet at tiden er forskjellig.

Hoffmann (1937, s. 25) er på grunnlag av et stort materiale kommet til det resultat at de ytre kjennetegn er lite fremtredende og til dels illusoriske, og at jo større materialet er, desto vanskeligere er det å holde de to formene fra hverandre. Han fant ikke nevneverdig forskjell hverken i genitalorganet eller hos larvene.

De beste kjennetegn han har funnet er følgende:

For selve dyrene:

Dekkvingene sett i profil med mørke, lett synlige korn på mellomrommene, børstene på brystskjoldet og dekkvingene temmelig lange og tydelige, kroppen bredere, bredden av dekkvingene 1,5—1,8 mm, brystskjoldet oftest bredest ved eller nær roten, sidene svakt rundete, avsmalnende framover helt fra bakhjørnene ..... *fraxini* Panz.

Dekkvingene med meget små, mørke korn som er vanskelige å se også mot spissen, børstene på brystskjoldet og dekkvingene meget kortere, finere og mindre tydelige, kroppen smalere, mer innsnevret bakover, bredden av dekkvingene 1,2—1,3 mm, brystskjoldet vanlig bredest i den bakre tredjedel, sidene temmelig krumme, bakhjørnene mer rundete ..... *orni* Fuchs.

For gangsystemet:

Morgangen klammerformet, vertikal på stammen eller greinen, larvegangene ikke eller lite krumme, vertikale på morgangen, lengden opp til 5—7 mm, flygehullene 2 mm brede .. *fraxini* Panz.

Morgangen mer eller mindre skråttstillet eller langsstillet, larvegangene tettsittende, krumme eller meget krumme, smalere, kortere, sjelden over 4 mm lange, oftest skråttstillet i forhold til morgangen, flygehullene 1,5 mm brede ..... *orni* Fuchs.

Men Hoffmann godtar ikke disse forskjellighetene som tilstrekkelige til å regne *orni* som egen art. Han holder den for en biologisk rase av *fraxini*.

I de senere spesialarbeider har Balachowsky (1949, s. 92) og Victor Hansen (1956, s. 25) *orni* som egen art, det samme har Horion (1951, s. 507), mens Stark (1952, s. 173) holder det for sannsynligst at den er synonym med *fraxini*.

Den 3/5 1954 fant jeg i rusk som jeg fisket opp av en liten elv i utkanten av Oslo, et eksemplar av *orni*, og i mai 1960 tok jeg et par flygende eksemplarer på samme sted. Sammen med A. Bakke kom jeg over noen eksemplarer i askegreiner i Ø: Rygge den 16/6 1960 uten at jeg da var klar over at det var *orni*.

Under mine forsøk på å finne materiale med gangsystemet kom jeg den 11/9 1962 på AK: Hovedøya over flere armtykke askegreiner, som dels ble undersøkt på stedet og dels tatt med for klekking. Alle dyrene fra dette materialet var *fraxini*.

Den 25/9 1962 lyktes det endelig å finne materiale med *orni*. I skogen ved AK:Dæli i Bærum like sørvest for Oslo lå det etter en hogst en del askegreiner som var befengt med *Leperisinus*. Noen av disse greinene tok jeg med, og allerede neste dag begynte imagines å krype fram. I løpet av en måned fikk jeg 222 eksemplarer av *orni* og 49 av *fraxini*. Noen 2,5—3 cm tykke greiner som ble skilt ut, ga utelukkende *orni*, og gangsystemene var typiske *orni*-systemer. Et av dem er vist i fig. 2. Som tilfelle var med Wagner, har heller ikke jeg hatt noen vanskeligheter med å holde de to formene fra hverandre i mitt materiale.

Av alle de kjennemerker som er nevnt for *orni*, er en del variable, til dels meget variable. Det gjelder således størrelsen, kroppsformen og fargen og tegningene på dekkvingene. Derimot synes dekkvingebørstene, som særlig på sidekantene er meget kortere, og dekkvingekornene som er meget finere hos *orni* enn hos *fraxini*, alltid å gi sikre holdepunkter. Punktstripene på dekkvingene er også alltid smalere hos *orni* enn hos *fraxini*.

I den ytre form av penis har jeg i likhet med Wagner ikke kunnet finne nevneverdig forskjell, derimot synes den indre kitinutrustning konstant å være tydelig spinklere hos *orni* enn hos *fraxini*. Det kunne ligge nær å tro at denne forskjellen er avhengig av dyrenes størrelse, men jeg har funnet den samme forskjell både når *orni* er større enn *fraxini* og omvendt. Hos *orni* er spermathecaen tydelig større enn hos *fraxini*.

Som fig. 1 viser, er larvegangene hos *fraxini* vanligvis godt skilte fra hverandre, og står noenlunde loddrett på morgangen, mens de hos *orni* står så tett at de for en stor del smelter sammen, og de er også mer krumme enn hos *fraxini* og mer skråttstillet i forhold til morgangen.

Forskjellen i de to gangsystemene kan ikke godt skyldes at *orni* oftest yngler i tynnere materiale enn *fraxini*, for som fig. 1 viser, er den karakteristiske form for hver av artene beholdt også når de to systemene ligger side om side.

Etter det som hittil har vært kjent, er utbredelsen av *orni* innskrenket til M.-Europa, hvor den er funnet på en rekke steder: Tyskland, Frankrike, Sveits, Polen, Tsjekkoslovakia, Østerrike, Bulgaria, Sovjet-Samveldet (Ukraina, Krim). Jeg har imidlertid

også sett eksemplarer fra Danmark og Sverige, som jeg holder for *orni*.

Fra de Britiske øyer er den meg bekjent ikke oppgitt. Jeg har i sin tid av P. Harwood fått noen eksemplarer fra Hartlebury, klekket i juli 1930, som *fraxini*, men de er utvilsomme *orni*.

De kontrollerte norske funn av de to formene, som jeg mener det er rettest å regne som særskilte arter, er følgende:

fraxini: Ø: Fredrikstad (Munster), Rygge (Bakke og A. Strand), Rauer (Bakke), Slevik (Vik). AK: Tøyen (Siebke), Hovedøya (A. Strand,) Svartskog (Sundt), Aker (T. H. Schøyen), Røa (A. Strand), Bygdøy (A. Strand), Dæli (A. Strand), Brønnøya (A. Strand), Bø: Kongsberg (Munster), Sansvær (Munster), Ringerike (Warloe). VE: Nykirke (Statens planteverns samling), Tønsberg (Fjelddalen). TEy: Kragerø (Ullmann). AAy: Nedenes (Aall), Risør (Warloe), Tromøy (Bakke), Øyestad (Bakke), Bukilen (Tvermyr), Eydehamn (Elsa Engebretsen), Birkenes (Aamlid). VAy: Halse og Harkmark (Bakke). HOi: Kvinnherad (Bakke).

orni: Ø: Rygge (Bakke og A. Strand), Rauer (Bakke). AK: Drøbak (Warloe), Nesodden (Munster), Røa (A. Strand), Dæli (A. Strand).

Som det sees, har *orni* en langt mer begrenset og østlig utbredelse i Norge enn *fraxini*.

Auszug

Der Verfasser schliesst sich der Auffassung an dass es sich bei *Leperisinus orni* Fuchs um eine gute Art handelt.

Viele der Merkmale die als für *orni* charakteristisch erwähnt worden sind, wie z. B. Grösse, Form, Färbe und Flügeldeckenzeichnung, sind sehr variabel, dagegen scheinen die Borsten, besonders an den Seitenrändern der Flügeldecken, konstant kürzer und die Körnelung der Flügeldecken feiner bei *orni* als bei *fraxinus* zu sein. Auch scheint die Chitinausrüstung im Penis, unabhängig von der Grösse der Tiere, bei *orni* zarter als bei *fraxini* gebaut zu sein, während die Samenkapsel bei *orni* grösser als bei *fraxini* ist.

Im Gegensatz zu *fraxini* brütet *orni* am liebsten in dünnen Stangen und Ästen. Die Gangsysteme der zwei Arten sind verschieden, auch wenn die Arten Seite an Seite brüten.

Litteratur

BALACHOWSKY, A., 1949: Faune de France, 50, Coléoptères Scolytides. — Paris.

BEDEL, L., 1924: Faune des Coléoptères du basin de la Seine, VI bis. — Paris.

ESCHERICH, K., 1923: Die Forstinsekten Mitteleuropas, Bd. 2. — Berlin.

FUCHS, G., 1906: Ein neuer Bastkäfer: *Hylesinus orni*. — Münch. Kol. Zeitschr., III.

GYLLENHAL, L., 1813: Insecta Suecica, Coleoptera, I, pars III, — Scaris.

HANSEN, VICTOR, 1956: Danmarks fauna. Biller XVIII, Barkbiller. — København.

HOFFMANN, A., 1937: *Hylesinus orni* Fuchs est-il une espèce? — Misc. Ent., XXXVIII.
HORION, Ad., 1951: Verzeichnis der Käfer Mitteleuropas, 2. Abt. — Stuttgart.
KÜNNEMANN, 1919: *Hylesinus orni* Fuchs. — Ent. Bl., XV.
NÜSSLIN, O., 1911: Phylogenie und System der Borkenkäfer. — Zeitschr. f. wissenschaftl. Insektenbiologie, VII.
REITTER, E., 1906: Catalogus Coleopterorum Europae, Caucasi et Armeniae rossicae, auctoribus L. v. Heyden, E. Reitter, J. Weise. — Berlin, Paskau, Caen.
— 1913: Bestimmungstabelle der Borkenkäfer. — Wien. Ent. Zeit., 31.
SAINTE-CLAIRE DEVILLE, J., 1938: Catalogue raisonné des Coléoptères de France. — L'Abeille, XXXVI, 4.
SIMMEL, R., 1924: Zur Lebensweise des *Leperisinus orni* Fuchs im Vergleiche mit *Leperisinus fraxini* Panz. — Ent. Bl., XX.
STARK, V., N., 1952: Fauna SSSR, Biller XXXI, Barkbiller (russisk tekst). — Moskva, Leningrad.
WAGNER, H., 1914: Über die Artrechte des *Hylesinus orni* Fuchs (Col.) — Ent. Mitt., III.
WEICHMANN, H. E., 1927: Über die geographische Verbreitung der Ipidae (Col.), II. Die Ipidenfauna Niederösterreichs und des nördlichen Burgenlandes. — Kol. Rundschau, XII.

Aderus pygmaeus De G. og *A. oculatus* Panz. (Col., Aderidae)

Av Andreas Strand, Oslo

Det har hersket stor uklarhet om den systematiske stilling for *Aderus oculatus*. Reitter (Fauna Germanica, III, 1911) regner den som var. til *A. pygmaeus*, i Winklers katalog står den som ab. til *pygmaeus*, og i St.-Claire Deville og Méquignons katalog over Frankrikes biller av 1937 står den som synonym til *pygmaeus*.

I motsetning til dette har både Lindroth (Svensk insektfauna, 1933) og Victor Hansen (Danmarks fauna, Biller XII, 1945) samt den nordiske billekatalog av 1939 *oculatus* som egen art.

Horion (Faunistik der mitteleuropäischen Käfer, V, 1956) har som sin mening om spørsmålet fremholdt følgende: «Die angegebenen Unterschiede (Länge der Fühler, bes. des Endgliedes, Punktierung, Grösse) können mich in der Anwendung auf deutsche Stücke nicht davon überzeugen, dass es sich wirklich um zwei gute Arten handelt; bisher sind auch keine Unterschiede in den Genital-Organen festgestellt worden. Ich betrachte vor wie nach *oculatus* als Aberration von *pygmaeus* und habe deshalb auch von den vielf. Meldungen des *oculatus* in Deutschland abgesehen».

Det er vel dette som er grunnen til at *oculatus* er slått sammen med *pygmaeus* i den nye nordiske billekatalogen av 1960.

Den av Horion etterlyste genitalundersøkelse har jeg nå foretatt. Det materiale som har stått til min rådighet er meget beskjedent, men likevel tilstrekkelig til å vise at det avgjort dreier seg om to forskjellige arter.

De genitalundersøkte ♂♂ er fra følgende steder:

pygmaeus: Gotska Sandön, Sverige (Palm) (fig. 1 og 3).
St:Reposaari, Finland (V. Lauro).
Umgegend Paskau, Moravia (Reitter).

oculatus: Bognæs, Danmark (West).
Et eksemplar uten lokalitet, sannsynligvis mellomeuropeisk (fig. 2 og 4).

De få norske funn som er gjort, er følgende:

pygmaeus: AK:Brønnøya (A. Strand), Røa (A. Strand),
AAy:Risør (Warloe ifølge Helliesen).
3 eksemplarer uten lokalitet (Berg, Esmark).

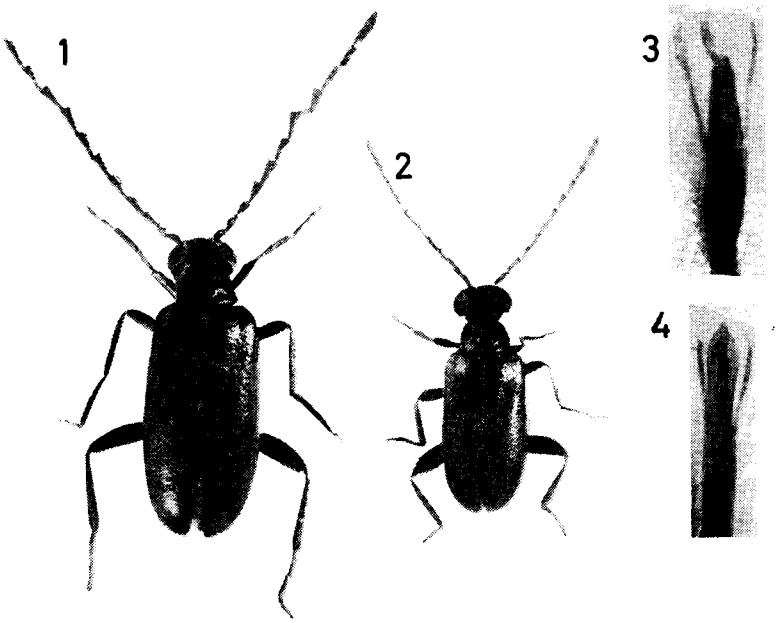


Fig. 1—4. 1. *Aderus pygmaeus* De G. 2. *Aderus oculatus* Panz. 3. Aedeagus av *Aderus pygmaeus* De G. 4. Aedeagus av *Aderus oculatus* Panz.

oculatus: ?AAy: Nes jernverk (2 eksemplarer uten lokalitet i Aalls samling).

Etter Horion (l. c.) skal *pygmaeus* være knyttet til eik. For *oculatus* er nok det tilfelle, selv om den leilighetsvis forekommer også på andre løvtrær, således har Palm (Die Holz- und Rinden-Käfer der süd- und mittelschwedischen Laubbäume, 1959) funnet noen eksemplarer i en hul alm med *Cossus*-angrep.

Pygmaeus derimot er både i Sverige og Finland også funnet langt nordenfor nordgrensen for eik og må iallfall der gjennomgå sin utvikling i andre treslag. Palm har opplyst at det foran nevnte eksemplar fra Gotska Sandön ble tatt i kronen på en vindfelt furu.

Jeg takker Palm, Håkan Lindberg og Martin Meinander for lån av materiale.

Auszug

Der Verfasser hat durch Genitaluntersuchungen gezeigt, dass es sich bei *Aderus pygmaeus* De G. und *oculatus* Panz. um zwei verschiedene Arten handelt.

Notes on cross-resistance and genetics of resistance to the DDT-group insecticides in the stable fly (*Stomoxys calcitrans* (L.)) (Diptera)

By Jørgen Stenersen
Department of Biochemistry, University of Oslo
and
Lauritz Sømme
The Norwegian Plant Protection Institute,
Division of Entomology, Vollebekk

Introduction

By selection in the laboratory it has been shown that the stable fly (*Stomoxys calcitrans* (L.)) is able to develop resistance to DDT, chlordane, and dieldrin. (Sømme 1958, 1962). In the present paper evidence is given of cross-resistance to TDE and methoxychlor in DDT resistant flies, and that resistance to these insecticides may be mainly inherited by one gene.

Methods and results

The rearing and test methods are essentially the same as in the previous papers. The flies were given both 10% W/V honey solution and citrated blood. The insecticides used were chemical pure dissolved in analar acetone solutions.

The following strains were used:

S: Susceptible laboratory strain obtained from Dr. P. Granett of Rutgers University N. J., U.S.A.

Rl: Slightly resistant strain not selected in the last five generations.

R: Resistant strain selected in more than 15 generations with DDT. The resistance did not increase in the last 10 generations.

The Rl strain was tested for resistance to DDT, TDE and methoxychlor by the continuous exposure method. Sheets of

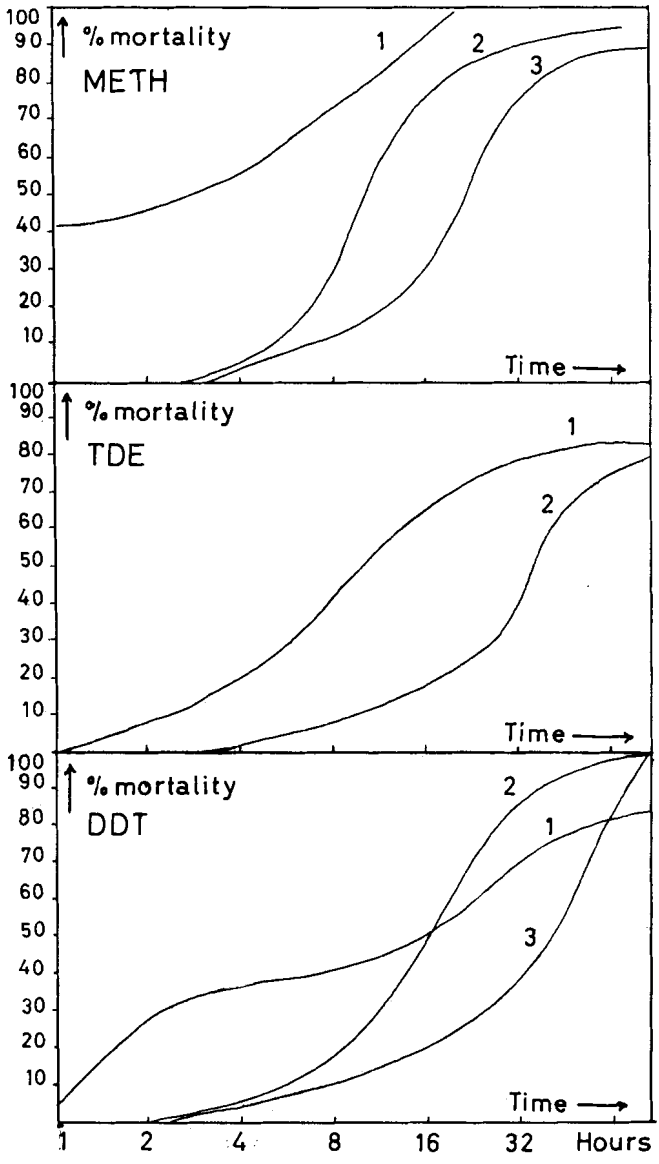


Fig. 1. Results of continuous exposure tests on 1: Strain Rl. 2: Offspring of Rl flies which had been selected at 50% survival with DDT prior to breeding. 3: Offspring of Rl flies which had been selected at 20% survival prior to breeding.

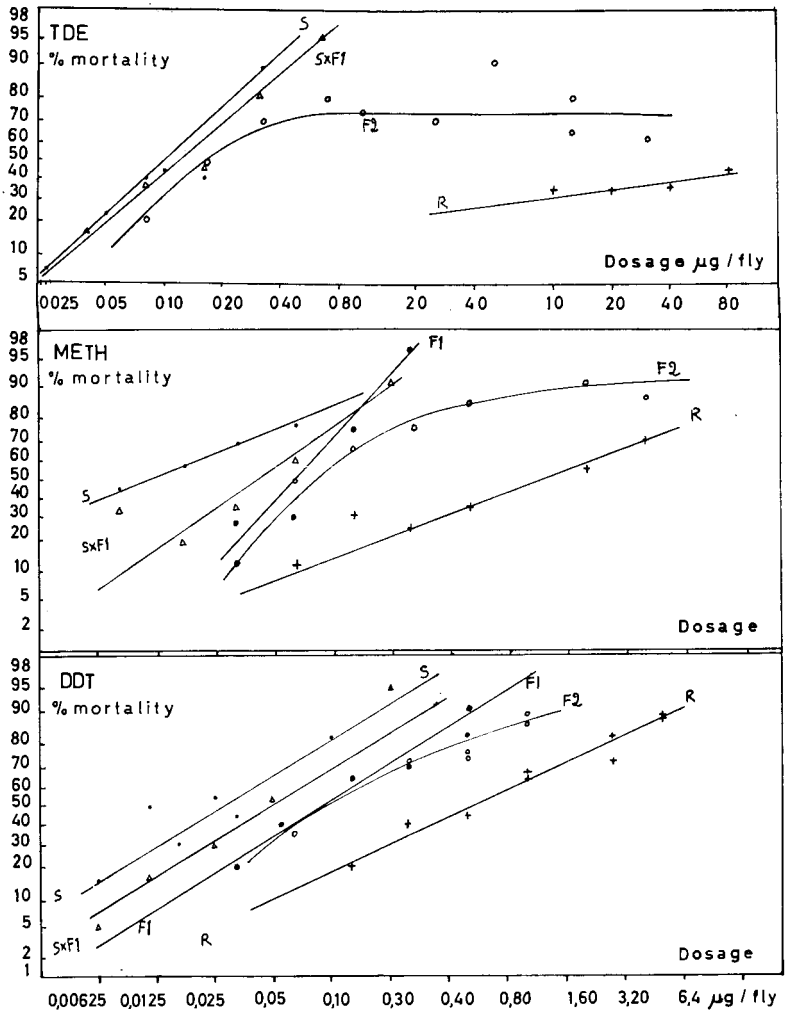


Fig. 2. Results of dosage-mortality tests on S, R, F1, S × F1, and F2 flies for the three insecticides.

blotting paper, 10×30 cm, were treated with 5 ml of 2% acetone solutions of the insecticides. The papers were made into cylindrical cages in which the flies were kept for tests. Offspring of the flies selected with DDT to 20% and 50% survival were tested for resistance to the three insecticides. Fig. 1 shows that selection with DDT also increased the resistance to TDE and methoxychlor. Each test is based on 100 flies. Flies of the S strain

were 100% knocked down in one hour by all three insecticides. Kelthane seems to be non-toxic.

Strains S and R were used in the genetic study. The degree of resistance was tested by the drop test method with 1 μl acetone solution of insecticide per fly, delivered from a microbyrette. Mortality counts were made 24 hours after treatment. Results are given in fig. 2, where each point in the diagram is based on 20 flies for S, F1, S × F1 and R, and on 40 flies for F2. Compared to the susceptible strain, R flies were about 25 × more resistant to DDT, and 110 × more to methoxychlor at the 50% mortality level. Resistance to TDE was even higher, and a dosage of 80 ug/fly gave only 40% mortality.

R ♀♀ were collected within 24 hours after hatching and crossed with S♂♂.

The offspring (F1) showed only a small degree of resistance to DDT and methoxychlor. The mortality curve for F1 flies treated with TDE also seems to be close to the S curve, but sufficient data for calculation were not obtained.

When F1♂♂ flies were crossed with S ♀♀ the next generation (S × F1) gave mortality curves between F1 and S. F1 flies were also inter-crossed to give a F2 generation. The slopes of the mortality curves for F2 were less steep than for F1, and were not straight lines, indicating a more heterogeneous population. For TDE, the curve levelled off at about 75% mortality.

It seems likely that resistance to the three insecticides is mainly due to one recessive gene. This is indicated by the fact that almost all resistance was lost in the F1 generation. That 1/4 of the flies survived treatment with TDE in F2 suggests a 3:1 ratio between susceptible and resistant flies in this generation. Similar results were obtained when F2 were exposed to blotting papers treated with DDT and methoxychlor. About 75% were knocked down very soon, and the remaining 25% had as little mortality as R flies tested at the same time (fig. 3).

Flies of the F1 generation were about 4 × more resistant to DDT and 8 × more resistant to methoxychlor compared with S flies. It seems therefore likely that one or more additional genes for resistance are present, but are of less importance than the main gene.

A c k n o w l e d g m e n t : The authors wish to thank Professor Søren Laland for his interest in the work.

Summary

In the present paper cross-resistance to TDE and methoxychlor is demonstrated in two DDT-resistant strains of the stable fly (*Stomoxys calcitrans* (L.)). By selection with DDT, one strain

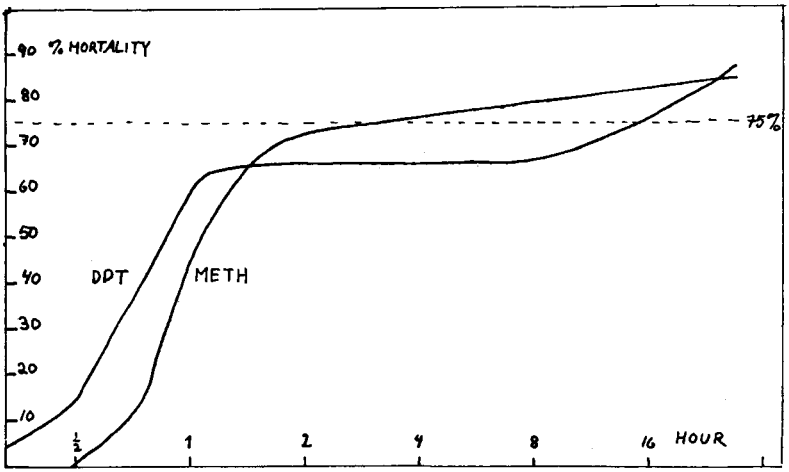


Fig. 3. Results of continuous exposure tests on F2 flies.

became 25× more resistant to DDT at the 50% mortality level, 110× more resistant to methoxychlor, and still more to TDE. It seems likely that resistance to the three insecticides is mainly caused by one recessive gene but less important genes are probably also present.

Literature

SØMME, L., 1958: The number of stable flies in Norwegian barns, and their resistance to DDT. — J. Econ. Ent. *51*, p. 599.

— 1962: Notes on resistance to chlorinated hydro-carbon insecticides in the stable fly *Stomoxys calcitrans* (L.). — Norsk Ent. Tidsskrift *12:* 11—16.

Notes on Odonata from the Haugesund district, SW Norway

By Arnold Åbro
Zoological Laboratory, University of Bergen

Papers on the distribution of Norwegian dragonflies (Sømme 1937 and Tjønneland 1953) do not have any finds from the Haugesund peninsula. On the whole the dragonfly fauna of Western Norway has been little investigated (cf. also Valle 1952). The dragonfly fauna of the coastal districts of southern West Norway has much in common with that of the British Isles, although the latter is richer in species. Since the summer 1952 I have collected dragonflies in the neighbourhood of Haugesund. I think it may be of interest to publish a list of species recorded from this district. The determinations have been verified by dr. A. Tjønneland and Mr. A. E. Gardner, F.R.E.S., to whom I express my thanks.

Zygoptera

Lestes sponsa (Hansemann). Very common in late summer and early autumn.

Pyrrhosoma nymphula Sulz. Occur in early summer near running water, at no places particularly common.

Ischnura elegans (v. d. Lind.). In July this is a common species at lakelets and tarns near the coast. It has never been found in the midland and inland, so it seems to be a pronounced coastal form.

Enallagma cyathigerum (Charp.). It has been found on the coast as well as inland, but it occurs in greatest number in midland and inland.

Agrion hastulatum Charp. A few specimens were found in the midland but never taken in the coastal districts.

Agrion pulchellum v. d. Lind. This is perhaps the most common damselfly species flying in July in the coastal districts. It has never been recorded from the midland and inland, where it

seems to be replaced by *Enallagma cyathigerum* and *A. hastulatum*. My records support the supposition of Tjønneland (1953) that *A. pulchellum* is a coastal form.

Anisoptera

Aeshna juncea (L). This is a common species flying in late summer.

Aeshna grandis (L). Occurs from the coast to the inland, but is not so common as *A. juncea*.

Aeshna cyanea (Müll.). One specimen (♂) was taken at Førdesfjorden east of Haugesund 4/8 1956.

Cordulia aenea (L). One specimen (♂) was found at Førdesfjorden 2/7 1953.

Somatochlora metallica (v. d. Lind.). This species has been found in the midland, but never in great numbers. Only one specimen has been taken near the coast (1 ♂, Røyrvatn, Haugesund 18/7 1963).

Libellula quadrimaculata L. Common on the coast as well as in the midland and inland in early summer. It has also been observed on the coastal islands.

Sympetrum danae (Sulz.). A common species which flies from the end of July until September. Sømme (1937) mentions one specimen taken on the island Karmøy (Avaldsnes) by O. Meidell.

Sympetrum nigrescens Lucas. Common on the coast in late summer until October. My specimens were first — with doubt — determined as *Sympetrum striolatum nigrifemur* (Selys). The material has been checked by Mr. A. E. Gardner. By comparing with his own collection he concluded that my specimens belong to the species *S. nigrescens* Lucas. In the British Isles this species occur on the NW coast of Scotland and seems to be a pure coastal form.

Gardner (1955) has elevated *Sympetrum nigrifemur* to specific rank and *S. nigrescens* Lucas is recognized as a good species on genital characters. The larva of *S. nigrescens* is figured and described. It should be added that Gardner has identified *S. nigrescens* from Norwegian material collected in Øst-Agder, Buskerud (Modum) and Hordaland (Fana). For further details confer Gardner 1955.

Leucorrhinia dubia (v. d. Lind.). A few specimens have been found near Haugesund in early summer.

References

GARDNER, A. E., 1955: A study of the genitalia of the two species *Sympetrum nigrescens* Lucas and *S. nigrifemur* (Selys) with notes on their distribution (Odonata: Libellulidae). — Entomologist's Gazette 6, 86—108.

SØMME, S., 1937: Zoogeographische Studien über norwegische Odonaten. — Avh. norske Vidensk.-Akad. No. 12, 1937.

TJØNNELAND, A., 1953: A contribution to the Zoogeography of Norwegian Dragonflies. — Univ. i Bergen, Årbok 1952, naturvitensk. rekke, nr. 15.

VALLE, K. J., 1952: Die Verbreitungsverhältnisse der ostfennoskandischen Odonaten. — Acta Entom. Fenn. No. 10, 1—87.

Distribution of *Ernoporus tiliae* (Panz.) and *E. caucasicus* (Lindem.) (Col. Scolytidae) in Norway

By Alf Bakke
Norwegian Forest Research Institute, Vollebekk

Two species of bark beetles, *Ernoporus tiliae* (Panz.) and *E. caucasicus* (Lindem.), live on lime-trees (*Tilia cordata*). According to Lindroth (1960), *E. tiliae* has the widest distribution in the Nordic* countries. It has been found in southwest Finland, in south and central Sweden and on Lolland-Falster in Denmark (Hansen 1956). In Norway it has hitherto only been recorded from the county of Akershus (Lindroth 1960). The species is also distributed in east and central Europe (Balachowsky 1949) and in Britain (Duffy 1953).

Lindroth (1960) does not mention *E. caucasicus* from Finland and Norway. In Sweden, it is found in the south, in the district of Blekinge, and in Denmark, at Lolland-Falster, in the same forest as *E. tiliae* (Hansen 1960). It is distributed in east and central Europe (Balachowsky 1949) but not in Britain (Duffy 1953).

It is natural to conclude from the literature that *E. tiliae* is the most common species in the Nordic countries and that it lives in all districts where lime-trees grow whereas *E. caucasicus* is rare and only found in the southernmost districts.

Investigation on the bark beetles of Norway has been carried out at the Norwegian Forest Research Institute during the last five years. Both species of *Ernoporus* have been found in several localities in southern districts of Norway.

Ernoporus tiliae is found in the following places: The county of Akershus: Oslo (leg. Siebke, Moe, A. Strand), Oppegård (leg. A. Strand), Ås (leg. Bakke); the county of Aust-Agder: Froland (leg. Tvermyr), Dypvåg (leg. Bakke), Lillesand (leg. Bakke).

* Nordic: Denmark, Finland, Norway and Sweden.

Ernoporus caucasicus is found in the following places: The county of Akershus: Drøbak (leg. Austarå), Håøya (leg. Bakke and Sæther); the county of Aust-Agder: Froland (leg. Tvermyr), Tromøy (leg. Bakke); the county of Vest-Agder: Søgne (leg. Austarå and Bakke); the county of Hordaland: Skånevik (leg. Austarå and Bakke), Odda (leg. Austarå and Bakke).

These records show that *E. tiliae* is distributed in Akershus and on the coast of Aust-Agder. It is reasonable to assume that more detailed investigation in the lime-tree areas will show that the species is common also in the districts in between. *E. caucasicus* is new to Norwegian fauna and is known to be distributed in the coastal and fjord districts from Drøbak to the county of Hordaland. In the localities where the species was found, it was numerous in the bark of newly-decayed branches. The discoveries in the counties of Vest-Agder and Hordaland were made during June/July 1962. At that time the beetles were preparing their galleries. The discovery on Tromøy was made on April 10, 1963, and both imagines and larvae were in the bark of a dead branch of about 2 cm in diameter. At Drøbak, the beetles were found on May 26, 1963 and on Håøya, May 31, 1963, in branches of between 4 and 2 cm in diameter. On Håøya, the beetles were swarming in large numbers.

The northern border line for *Tilia cordata* goes through the coastal districts of south and west Norway (Hultén 1950). The distribution of the insect species associated with lime-trees in Norway, must, therefore, be limited. The lime-trees do not form stands in Norway, but grows mostly as scrub on steep, stony, slopes, exposed to the sun. On the hillsides around the fjords of west Norway and on the south coast, one may find large, old lime-trees together with *Fraximus* and *Ulmus*. In the post-glacial period a greater part of the southern districts of Norway was covered by these trees. By means of pollen-analytic investigations, Hafsten (1956) has proved that lime-trees were very common and widely distributed in the Oslofjord area from about the year 5000 B.C. to about 500 B.C. In this period lime-trees were also common in the southern part of South Norway. The lime-trees which can be found to-day, are surely the remains of these lime-tree forests.

It is reasonable to assume that insect species associated with lime-trees were more common and had a greater distribution in this country in the period when lime-trees were more abundant. Southwood (1962) points out that the more abundant trees have the greatest number of insect species associated with them, and the rarest trees have the smallest number. For these reasons we may suppose that *E. tiliae* and *E. caucasicus* had a greater distribution in Norway in the post-glacial period than to-day,

particularly when we know that they are common in the districts where lime-trees are abundant to-day. The reason, however, why *E. caucasicus* is common in the southern part of Norway, but not recorded elsewhere in Scandinavia — besides Blekinge — is difficult to explain. The lack of records of *E. tiliae* in southwest Norway may also give rise to speculation. Closer studies of the ecology of the species and a more thorough investigation of the distribution are necessary before the problem can be solved.

References

BALACHOWSKY, A., 1949: Coléoptères Scolytides. — Faune de France 50. 320 pp. Paris.

DUFFY, E. A. J., 1953: Coleoptera. Scolytidae and Platypodidae. — Handbooks for the identification of British insects V, Part 15. 20 pp. London.

HAFSTEN, U., 1956: Pollen-analytic investigations on the late Quaternary development in the inner Oslofjord area. — Univ. Bergen Årb. 1956, Naturvit. R. Nr. 8. 161 pp. Bergen.

HANSEN, V., 1956: Barkbiller. — Danmarks Fauna 62. 196 pp. København.

HULTÉN, E., 1950: Atlas of the distribution of vascular plants in NW. Europe. 512 pp. Stockholm.

LINDROTH, C. H., 1960: Catalogus Coleopterorum Fennoscandiae et Daniae. 476 pp. Lund.

SOUTHWOOD, T. R. E., 1960: The evolution of the insect-host tree relationship — a new approach. — XI. Intern. Kongress f. Ent. Verhandl. Bd. I. Pp. 651—655.

Hylesinus oleiperda Fabr. and *Pityogenes trepanatus* Nördl. (Col., Scolytidae) new to Norwegian fauna

By Alf Bakke
Norwegian Forest Research Institute, Vollebekk

During the last five years investigations have been carried out at the Norwegian Forest Research Institute to study the distribution and abundance of bark beetles in Norway. In the material collected, two species, new to Norwegian fauna, were found.

Hylesinus oleiperda Fabr. was recorded on the island of Rauøy in the county of Østfold on the eastern side of the Oslofjord. The forest consists of Norway spruce, *Picea abies*, mixed with various broad-leaved trees, but particularly ash, *Fraxinus excelsior*. The species was found in great numbers on May 25, 1963 in thin twigs of a tree cut in early spring the same year. The beetles had worked out their galleries across the twigs. Two small galleries about 4—8 mm, not equal in length, originated from the entrance hole (Fig. 1). Individual egg niches were made but only 2—3 larval galleries originated from each egg gallery.

According to Lindroth (1960) *H. oleiperda* Fabr. is recorded from Skåne and Upland in Sweden but not from Norway and Finland. In Denmark it is recorded in different localities, but Hansen (1956) points out that it is rare. It is distributed in southeast and central Europe (Balachowsky 1949) and on the British Islands (Duffy 1953).

Pityogenes trepanatus Nördl. was found in branches of an old dying spruce (*Picea abies*) on the island of Tromøy, in the county of Aust-Agder. The forest lies only about 100 m from the sea, strongly exposed to the wind. Only 2 specimens were found on July 25, 1962 among specimens of *Pityogenes chalcographus* L. and *Pityophthorus micrographus* L.

On July 16, 1963 the species was found in great numbers on Scots pine (*Pinus sylvestris*) on the inner part of Tromøy.

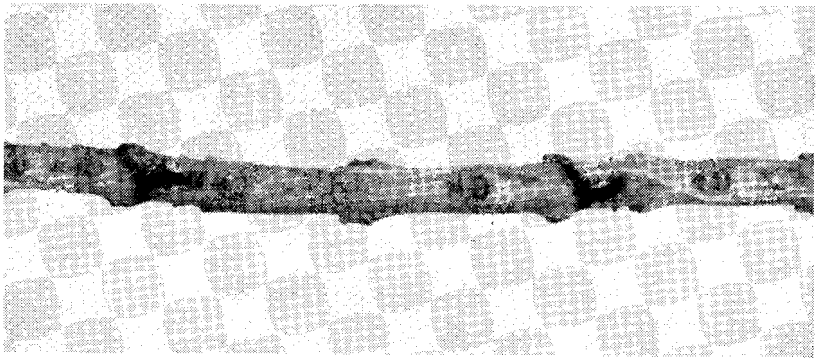


Fig. 1. Egg galleries of *Hylesinus oleiperda* Fabr. in the inner bark of a twig of ash.

Adults were taken from galleries under the bark of branches which had died the previous year because of snow damage. The beetles had worked out their galleries, and eggs were laid, but no larvae were hatched. The rest of the tree was apparently without injury of any kind.

According to Spessivtseff (1922) and Hansen (1956) the species lives on Scots pine. It, therefore, deserves notice that the species was found on spruce.

P. trepanatus is distributed in southwest Finland, south and central Sweden and Denmark (Lindroth 1960). It is common in central and south Europe (Balachowsky 1949) and local in Britain (Duffy 1953).

References

BALACHOWSKY, A., 1949: Coléoptères Scolytides. — Faune de France 50. 320 pp. Paris.

DUFFY, E. A. J., 1953: Coleoptera. Scolytidae and Platypodidae. — Handbooks for the identification of British insects V, Part 15. 20 pp. London.

HANSEN, V., 1956: Barkbiller. — Danmarks Fauna 62. 196 pp. København.

LINDROTH, C. H., 1960: Catalogus Coleopterorum Fennoscandiae et Daniae. 476 pp. Lund.

SPESSIVTSEFF, P., 1922: Bestämningstabell över svenska barkborrar. — Medd. Skogsförsöksanst. Stockh. 19. Pp. 453—492.

Amphipyra lithoxylea F. ny for Norge (Lepidoptera, Noctuidae)

Av C. F. L ü h r, Lom

Den 25. juli 1962 tok jeg i Søgne (VAy) en for landet ny noctuide *Amphipyra lithoxylea* F.

Når den i litteraturen angis å være funnet i Norge må det skyldes feilbestemmelser, idet foretatte undersøkelser i norske samlinger ikke kan bekrefte at den er tatt tidligere i landet.

Magne Opheim anfører da også i «Catalogue of the Lepidoptera in Norway», Part II: All the "*A. lithoxylea* F." specimens in the Zool. Mus., Oslo, are *A. sublustris*.

Nordstrøm/Wahlgren: Svenska Fjärilar anfører at arten tilhører det sørlige barskogsområdet (Eikeregionen) og er tatt i kystområder i Sør-Sverige, fra Skåne og oppover østkysten til og med Upland, samt Halland på vestkysten.

Hoffmeyer anfører i De Danske ugler at arten er ikke sjelden i Danmark, visstnok sparsomst i Vestjylland. *A. lithoxylea* er funnet i Finland og for øvrig utbredt i Mellom-Europa til Dalmatia.

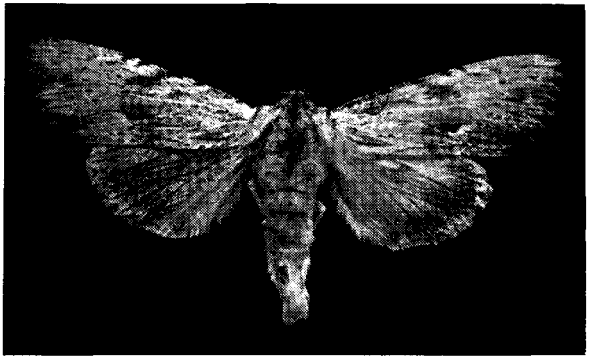


Fig. 1. *Amphipyra lithoxylea* F. fra Søgne (VAy). 1,5 ×. Foto: N. Knaben.

Larven lever av visse gressarters mjuke deler og holder seg skjult om dagen i et spunnet hylster ved gressroten.

I mitt tillegg til fortegnelse over Macrolepidoptera fanget i Lom herred (On) (Norsk Entomologisk Tidsskrift Vol. XII, 1962) er der dessverre en feil idet *Sarothripus revayanus* Sc., er oppført som fanget i Lom 7. juni 1959. Denne art bes velvilligst strøket av fortegnelsen.

Bokanmeldelse

Ad. Horion: *Faunistik der mitteleuropäischen Käfer*, Band IX: *Staphylinidae*, 1. Teil, *Micropeplinae* bis *Euaesthetinae*. Ueberlingen-Bodensee 1963. 412 s.

Det er ingen annen billegruppe som i den senere tid i den grad har vært i støpeskjeen som staphylinidene. For den nordiske faunaen er vi i den heldige situasjon at vi har fått nye, ajourførte samlearbeider av Victor Hansen i «Danmarks fauna» og delvis av Palm i «Svensk insektfauna», og den nordiske billekatalogen av 1960 gir en skjematisk oversikt over utbredelsen i Norden.

For den mellomeuropeiske faunaen har vi derimot savnet slike arbeider, når en da ser bort fra den skjematiske oversiktslisten som Horion utga i 1951 («Verzeichnis der Käfer Mitteleuropas»).

Nå er Horion kommet så langt med sin «Faunistik» at første del av staphylinidebindet foreligger, og det er, som det var å vente, blitt et både omfattende og grundig arbeid. I alt vil vel stapylinidebindet komme til å omfatte ca. halvannet tusen sider.

Som tittelen sier er det først og fremst utbredelsen som er behandlet, og her er det gjort et imponerende arbeid, som bare har vært mulig med hjelp fra en lang rekke medarbeidere.

Også når det gjelder systematiske spørsmål inneholder arbeidet mangt av interesse. Det er ennå en del tilfelle hvor spesialistene ikke er enige. Horion har pekt på dem, og forhåpentlig vil det føre til at spørsmålene kan bli avklaret.

I likhet med de tidligere bind er det også her gitt utførlige opplysninger vedkommende funnforhold.

Blant opplysningene om norske forekomster er det bare et par små uoverensstemmelser som jeg har kunnet finne. Således er forekomsten av *Thinobius brevipennis* i Nord-Norge sikker nok, og det samme er tilfelle med *Bledius denticollis* (Steel har sammenliknet nordnorske eksemplarer med typen).

For *Bledius fuscipes* oppgir Horion at forekomsten i Nord-Norge er tvilsom, og det stemmer med det som står i den nordiske billekatalogen. Steel, som har sett nordnorske eksemplarer, holder dem for *fuscipes*. Komplekset omkring *fuscipes* er meget vanskelig, og vi får håpe med Horion at Lohse vil kunne klare opp spørsmålet i det arbeid som han nå holder på med.

Andreas Strand.

Rettelse

I bind XII, hefte 1—2, 1962, side 50, 3. linje står: «Lindroths antagelse om at *Aepus* er en høstforplanter, er sikkert riktig, . . .» Denne bemerkning må utgå. De i oversikten nevnte data er ikke entydige, og det kan ikke trekkes noen sikre slutninger om artens forplantningstype. Den tilsynelatende mangel i mai, juni kunne riktignok antyde en høstforplantning, men nyklekkete individer i september gjør en vårforplantning vel så rimelig.

Johan Andersen.

Insect Species Recorded as New Pests on Cultivated Plants in Norway 1946—62

By Jac. Fjelddalen
Norwegian Plant Protection Institute,
Division of Entomology, Vollebekk

Introduction

In the reports of the government entomologists (W. M. Schøyen 1891—1912 and T. H. Schøyen, 1913—1939) annual surveys are given of insect pests and their occurrence in Norway in the period 1891—1939.

The present author has each year since 1946 collected insect pests and attacked plant material from cultivated plants in order to obtain information on new insect pests and as a part of the institute's extension service.

The present paper gives a review of the new insect pests found in the period 1946—1962. A list of the known distribution as a pest and notes on the life history, symptoms of attack and injury, are given separately for each species. The host plant, location and date are given for each find. As symbols for finds of imagines and reared materials are used (i), for larvae (l), and for attacked plant material (p). Locations are arranged according to Strand (1943) and his proposed abbreviations are used in the lists, see map (Fig. 13).

The scientific names of the host plants are used according to the list of Thorsrud and Reisæter (1948) and the common English names according to Thomas and Janson (1957).

The list of distribution is based on the collection of the Norwegian Plant Protection Institute, Division of Entomology. Most of the finds have been collected by the author but partly also by the late government entomologist T. H. Schøyen and by members of the staff, O. Ausland, T. Edland, T. Rygg,

J. Røyrvik, C. Stenseth and G. Taksdal. Some samples sent to the Institute are also included.

The present article includes a total of 47 species representing 3 species of *Thysanoptera*, 10 of *Hemiptera* (exclusive of *Aphidoidea*), 9 of *Coleoptera*, 9 of *Lepidoptera*, 12 of *Diptera* and 4 of *Hymenoptera*. 10 of the species are new to Norwegian fauna.

The identification of the species is based mainly on imagines reared from collected larvae. The species belonging to *Coleoptera* have been checked by Andreas Strand, the *Lepidoptera* species by M. Opheim, *Stephanitis oberti* (Kol.) by G. Taksdal and *Psylla piri* L., *Aleyrodes fragariae* Walk., *Paroudablis piceae* Löw. by F. Ossiannilsson, to all of whom I am greatly indebted.

Species belonging to *Diptera* and *Hymenoptera* are identified mainly on the basis of attacked plant material when the species gives characteristic symptoms.

THYSANOPTERA

Fam. Thripidae

Parthenothrips dracaenae (Heeg.)

P. dracaenae (Palm thrips) was recorded in Norway by the author in 1951 (Fjelddalen 1953a). The species is new to our fauna. In the annual reports of the government entomologist the species was mentioned in 1920 as a possibility in connection with thrips larvae found on *Kenthia sp.*, but this find cannot be considered as valid.

Distribution and host plants.

Hedera colchica: AK: Oslo 4.XI.1951; Eidsvoll 17.VI.1960. *Citrus sp.:* AK: Oslo 24.I.1958. *Impatiens sultani:* HEs: Flisa 2.V.1956.

All finds include imagines and attacked leaves and have been collected by the author from plants grown in a greenhouse or in a private house.

Notes on life history.

Breeding goes on continuously during the year. When the average temperature is 18°C, one generation usually takes a month. The minute eggs are inserted into the tissue of tender leaves. The adults, which may be recognised by a dark "cross" on the dorsal side, use their wings very rarely; they make only short jumps. The yellow larvae, contrary to the adults, live in colonies.

Symptoms of attack and injury.

Both the adults and larvae rasp and suck sap, particularly on young half-developed leaves. Their method of feeding is rather peculiar; they scrape off the surface tissues and then suck

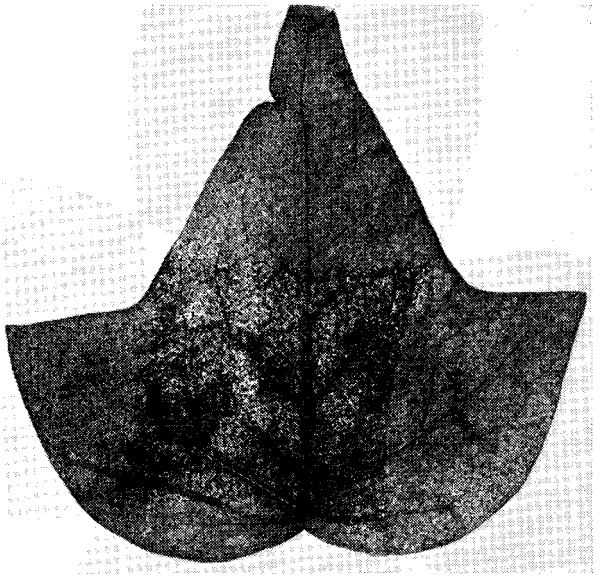


Fig. 1. Leaf of *Hedera colchica* severely injured by *Parthenothrips dracaenae* (Heeg).

up the exuding liquid together with minute fragments from the wound. The surface cells are destroyed and the leaves acquire a characteristic silvery or grey appearance. In addition, attacked leaves will have numerous small black dots of excrement spread over the surface.

The attacks may start before the leaves open, and the symptoms appear some time later. When serious attacks occur the terminal leaves wither.

Thrips calcaratus Uzel(?)

Quite heavy attacks of thrips on linden have been found by the author several times in the Oslo area. The species concerned is believed to be *Thrips calcaratus* Uzel, but this has still to be verified.

Distribution and host plants.
Tilia cordata: AK: Oslo 1.VI. and 14.VI.1960 (p).

No investigations have been carried out but the populations seem to be at their peak in June. The adults and larvae have only been found on very young growth in the first part of the summer.

The sucking of sap results in numerous dark spots on the surface of young leaves. Gradually the leaves and the top of growing shoots shrink and take on a strong dark colouring. In the case of heavy attack the terminal leaves may wither and finally fall off.

Fam. Phloethripidae

Haplothrips niger (Osb.)

H. niger (Clover thrips) was recorded in Norway by the author in 1956. The species is new to our fauna.

Distribution and host plants.
Trifolium pratense: AK: Hvalstad 13. and 15.VIII.1956. TEi: Fyresdal 20.VII.1961. Bv: Rollag 15.VIII.1962.

All finds include imagines and attacked plant material and were collected by the author.

Clover thrips may also live on wild umbelliferous and composite plants. Herstad (1960) has recorded it from flowers of *Taraxacum sp.* (AK: Maridalen, June 1958).

Hibernation occurs in clover fields and in grass land. Winged thrips leave the soil in June and search for flowers and tender leaves on which to lay their eggs. On clover the dark brown adults and the red shining larvae live in the flower heads.

Feeding starts normally on the stem of the inflorescence before flowering. The injury prevents development of seed and the flower heads dry up and get a dark brown colour. The attacks are only of importance on clover grown for seed production.

HEMIPTERA

Fam. Tingidae

Stephanitis oberti (Kol.)

S. oberti was recorded as a pest in Norway by T. H. Schøyen in 1949.

Distribution and host plants.
Rhododendron catawbiense: Ø: Askim 21.IX.1961. AAy: Fjære 9.VIII. 1953. VAy: Farsund 5.IX.1949; Kristiansand 19.VII.1961. HOy: Os 1.VIII.1962 and 10.IX.1962; Fana 24.XI.1956 and 16.VIII.1961; Bergen 1.VIII.1962. SFi: Balestrand 14.VIII.1953 and 13.VIII.1961. *Rhododendron molle:* AAy: Fjære 9. VIII.1953. VAy: Kristiansand 19.VII. 1961.

The finds include immature forms, imagines and attacked plant material.

Notes on life history.
The eggs, which are cream-coloured, are laid in rows or clusters

embedded in the underside of the leaf adjacent to the midrib. After laying, the protruding cap of the egg is covered with a secretion which dries to form a brown scab. The winter is passed in the egg stage and hatching begins early in June.

During summer the small spiny nymphs and the delicate adults with lace-like wings lying flat over the oval body, may be found sucking the juices from the underside of the leaves. The first two instars remain together in compact groups and reassemble if scattered. The adults occur from the last part of July until October. There is one generation annually.

Symptoms of attack and injury.

The Rhododendron Bug causes a yellow mottling — numerous yellow-white specks — on the upper surface of the leaves. The under surface becomes discoloured with rusty or brown excrement-spots and exuviae. Heavily attacked leaves may be loosely rolled downwards and dry up, and the plants lose vitality.

The species must be considered of minor importance in Norway.

Psyllidae

Psyllopsis fraxini (L.)

P. fraxini was recorded as a pest in Norway by the author in 1948. Identification is based mainly on attacked plant material.

Distribution and host plants.

Fraxinus excelsior: AK: Oslo 14.VII.1957; Bærum 27.VI.1959; Asker 20.VI.1960; Ås 4.VII.1960. HEs: Nes 28.VI.1960. Bø: Hole 16.VI.1961. AAy: Fjære 15.VII.1961. VAy: Søgne 20.VI.1948. An old sample of leaves kept since 1891 (col. W. M. Schøyen, AK: Bærum) was identified as attacked by *P. fraxini*.

According to Leatherdale (1959) the species was found in Ry: Stavanger, VIII. 1948 and by Trotter in AK: Oslo, VII. 1923.

After overwintering in the egg-stage, hatching occurs in early spring when the leaf-buds are about to open. The feeding of the immature forms causes formation of copper-coloured galls (due to the marginal leaf roll). The edges of the leaves are rolled downwards and the leaf-roll acquires a thickened and red or violet "vein-like" discolouring.

Rather heavy attacks have been observed locally.

Psylla piri L.

In the annual reports of the government entomologist, attacks of pear psylla were, probably correctly, ascribed to *P. piri* in 1901 and 1902. Attacks in all later years were ascribed to *P. pirisuga*. 3 specimens, collected in 1936, have been available for control and they were all *P. piri*.

Since 1948 the author, kindly helped by Ole B. Lundetræ, has collected several hundreds of specimens from different parts of Norway and all identified specimens turned out to be *P. piri* L.

Distribution and host plants.

Pyrus com. cult.: Known in all counties (fylker) in Southern Norway. *Malus domestica:* Several localities in Sogn og Fjordane (SFy and SFi).

Notes on life history.

The pear psylla overwinters in the adult stage sheltered in crevices and in the bark of spurs and trunks. They become active during bright, sunny periods early in spring. The minute, orange-yellow eggs are laid on spurs and shoots from April—May. After the foliage is out they oviposit on young leaves and on flower-stalks. The nymphs passing through five immature stages, become adults at the end of June. These adults deposit their eggs almost entirely on the foliage (in July), most of them on the under surface, along the midrib. The second generation is very abundant in some years. A third generation may occur in the south-western parts of Norway.

In western Norway the eggs of the first generation are often laid on apple. This host plant seems to be unsuitable as most of the eggs dry up or, if they hatch, the young nymphs die.

Symptoms of attack and injury.

The immature stages of the first generation live in numbers on developing buds, unopened flower trusses, young leaves, and on the bark of the terminal shoots. The attacks occur mainly during and just after blossoming. The second generation mostly feeds on the leaves and fruit and attacks in August—September.

The leaves are distorted and the skin of the fruit becomes scarred. Honeydew secreted by the insects runs down the foliage and fruit and a sooty fungus grows in it causing the foliage, shoots and fruit to blacken. Ants, wasps and many other insects are attracted to the honeydew and their presence provides a sure indication that pear psylla is present.

Severe infestation reduces the vitality of the trees and may prevent normal formation of buds. The new shoots are weak and may perish during the winter.

Pear psylla must be regarded as a major pear pest, especially in the south-western parts of Norway.

A survey of the investigations carried out since 1948 will be published later in a special paper.

Aleyrodidae

Dialeurodes chittendeni Laing.

D. chittendeni (Rhododendron white fly) was recorded as a pest in Norway by the author in 1953. The species is new to our fauna.

Distribution and host plants.
Rhododendron catawbiense: Ry: Sandnes 29.IX.1953 (i—p).

The white fly feeds on the underside of the leaves. The scale-like immature forms can almost cover the undersides. Yellowish mottling on the upper surfaces with a rolling of the margins indicates infestation. Apart from this damage, the immature forms excrete copious honeydew which covers the upper leaf surfaces and provides a medium for the growth of Sooty Moulds.

The species is of little importance as a pest.

Aleyrodes fragariae Walk.

A. fragariae (Strawberry white fly) was recorded as a pest in Norway in 1952 (Fjelddalen 1955). The species *A. lonicerae* Walk. may be regarded as a synonym.

Distribution and host plants.
Fragaria x cultorum: Bø: Hurum 16.VI.1953 and 27.V. 1954; Lier 4.VI.1955. VE: Sandefjord 4.XI.1957. Ry: Hetland 29.IX.1957 and 13.IX.1962. HOy: Meland 24.IX.1959 and 17.VII.1960. HOi: Ullensvang 21.IX.1954 and 7.XI.1960; Strandebarm 17.VIII.1956; Voss 27.IX. 1960. SFy: Gloppen 17.IX.1952. SFi: Sogndal 19.III. and 26.VI.1952, 14.VII. and 26.IX.1953; Innvik 14.VII.1960. *Lonicera periclymenum:* AK: Drøbak 27.X.1954 and 27.XI.1957. SFi: Sogndal 26.VI.1952 and 26.IX.1953. *Ribes nigrum:* SFi: Sogndal 26.IX.1953. *Hedera helix:* HOi: Strandebarm 7.X.1960.

Most of the finds include immature forms, imagines and attacked plant material.

In the annual reports by the government entomologist, occurrence of the species is mentioned from HOi: Ullensvang, 1908 and 1909, VE: Stokke, 1923 and Ø: Moss, 1926 but no remarks concerning damage are given and no specimens have been seen.

Notes on life history.
In 1952 numerous adults occurred in a strawberry field (northern latitude 61°) as early as March 19th. The small short-stalked eggs were laid on the undersides of the leaves very early in spring.

Fig. 2. Damage by *Aleyrodes fragariae* Walk. on the underside of strawberry leaves.

The larvae are scale-like and covered by a waxy excretion. Except during the first stage, the larvae remain immobile on the infested leaves and, when abundant, cover the undersides almost completely. There are probably three generations annually, the last, emerging in October and early November, being the most numerous. The winter is passed in the adult stage.

Symptoms of attack and injury.

In several cases the strawberry white fly has caused some damage, not only because it sucks the plant juice, but also because of the sooty mould which grows in the honeydew and which the larvae excrete in large quantities. As a result, the foliage loses vitality and even decays.

The species cannot be regarded as important in large strawberry fields, but in small gardens heavy attacks have occurred, particularly when the plants were grown under rather moist and shady conditions. Infestation may start on *Lonicera periclymenum* and later continue on strawberry and even black currant, as was observed in 1952.

Aleurochiton aceris Geoffr.

A. aceris was recorded in Norway by the author in 1951.

Distribution and host plants.

Acer platanoides: AK: Oslo 26.X.1951; 27.VIII.1952; 29.IX.1953 and 8.IX.1955 (i—p).

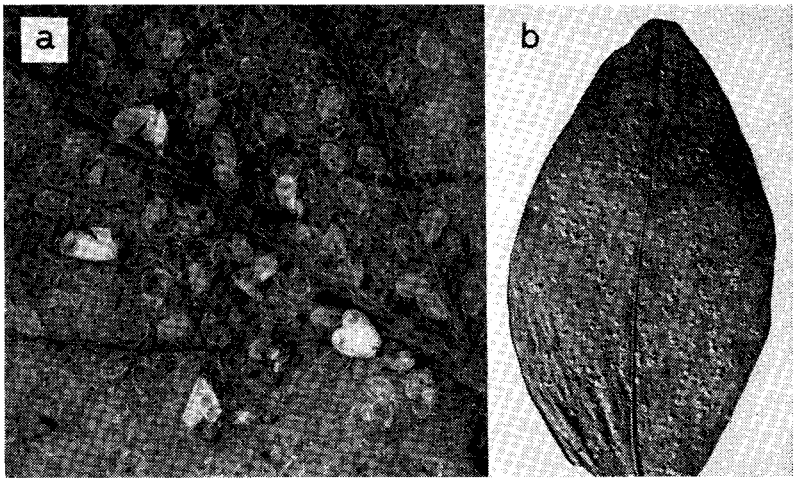


Fig. 3. Adults and immature stages of *Aleyrodes fragariae* Walk. on the underside of strawberry (a) and *Lonicera periclymenum* (b) leaves.

The white-powdered scale-like immature forms suck plant juice from the undersides of the leaves. This may lead to withering. The species is of little importance as a pest.

Aphidoidea

Several species occurring as new pests on cultivated plants have been recorded. A special paper will be published in the next issue of this journal.

Pseudococcidae

Pseudococcus maritimus Erhr.

Mealy-bugs are occasionally among the most troublesome greenhouse pests. According to observations since 1948 the most common species in Norway seems to be *P. maritimus*.

Distribution and host plants.

Mealy-bugs commonly occur in greenhouses in Southern Norway. They feed on a wide variety of greenhouse plants, and attacks have been recorded on amaryllis, ferns, ornamental asparagus, oleander, palms, *Fuchsia*, *Coleus*, *Myrtus* and *Hoya*.

Mealy-bugs are active throughout their entire life-cycle and suck sap from the stems and leaves. They have a habit of hiding inside curled leaves; they congregate at the base of leaves and

in the axils, and in these situations dense masses of egg sacks may be found. Honeydew and wax, excreted in large amounts, cover the leaves and attract Sooty Moulds. The insect itself is covered with white mealy wax and is rather difficult to find among the waxy secretions and white woolly egg sacks. Infested plants lose vigour and their leaves sometimes turn yellow and drop off.

Paroudablis piceae Löw.

P. piceae was recorded as a pest in Norway by the author on an ornamental hedge of spruce (*Picea abies*) in NTi: Stjørdal 19.VI.1961 (i—l—p). The species is new to our fauna.

Numerous mealy-bugs were found on the spruce-hedge sucking sap from the needles. The bugs, which were quite active in spite of heavy rainfall and low temperature (+12°C), occurred together with two different species of aphids (*Adelges laricis* Vall. and *Sacchiphantes abietis* L.). The winter was passed on the plants. Living mealy-bugs were collected February 27, 1962 (—11°C). The attack continued in the season of 1962.

Eriococcus spurius Mod.

E. spurius has probably occurred in Norway for many years. The records on ornamental *Ulmus glabra* are AK: Oslo 5.VIII.1949 and 18. VII.1960 (i—p).

This soft bark scale is not protected by a waxy covering. It may be noticed first as large numbers of elliptical or circular whitish rings surrounding a darker centre on the bark of the limbs and branches. The young were found clustered in crevices and cracks and the scale on wood two or more years old. They secrete large amounts of honeydew. The species is considered of minor importance.

Diaspididae

Pinnaspis aspidistrae (Sign.)

P. aspidistrae (Fern scale) was recorded as a pest in Norway by the author in 1956 (Fjelddalen 1957 a). The species is new to our fauna.

Distribution and host plants.

Pteris biaurata: AK: Oslo XI.1956. *Blechnum spicant:* AK: Oslo XI. 1956. *Nephrolepis sp.:* TEy: Skien 23.X.1956 and AK: Ås 17.III.1957. All records were collected by the author in greenhouses.

The presence of large numbers of the whitish and elongate conspicuous males and the ochre-brown mussel-shaped females on the underside of the leaves, renders the plants unsightly, reduces the amount of available food supply in the plant by the

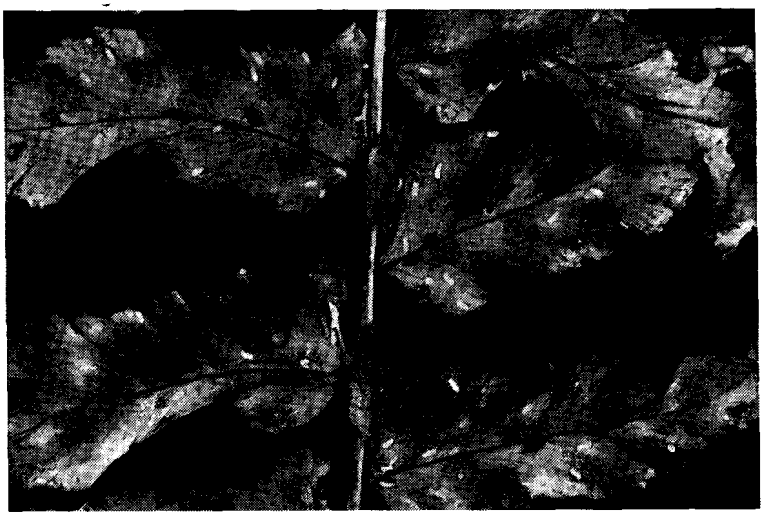


Fig. 4. The whitish, elongate males and the ochre-brown mussel-shaped females of *Pinnaspis aspidistrae* (Sign.) attacking *Nephrolepis*.

removal of sap, and results in checked growth and lowered vigour. Attacked leaves become first light yellow spotted. Gradually they turn yellow with terminal withering and premature leaf-fall. In general, attacks are easily localized, odd plants being infested while the remainder is quite clean.

The females occur in less numbers than males but live longer and are responsible for most of the damage. Attacks are most serious in greenhouses with dry air and high temperature.

The fern scale has hitherto been of minor importance as a pest on ferns in Norway; the most common species on this host plant is *Saissetia hemisphaerica* (Targ.) (known in Norway since 1916).

COLEOPTERA

Fam. Elateridae

Athous niger (L.)

A niger was recorded as a pest in 1959.

Distribution and host plants.

Triticum vulgare: AK: Nannestad 15.VI.1959. *Hordeum sp.:* Bø: Norderhov 22.VI.1961. VE: Brunlanes 17.VII.1962. *Secale cereale:* VE: Brunlanes 17.VII.1962. All records are finds of larvae reared to adulthood in the laboratory.

Fig. 5. Adults of *Lilioceris lilii* Scop. (left), *Otiorrhynchus ovatus* L. (middle) and *Otiorrhynchus arcticus* O. Fabr. (right).

The eggs are deposited in the soil, mostly at the roots of grasses, in pasture or in badly cultivated land. The larvae (wireworms) attack the plants in the same manner as the more common species belonging to *Agriotes*.

Cereals are attacked in the young stage, the larvae moving from plant to plant. The stems are chewed and frayed just above the seed and the plants wilt and die.

Fam. Chrysomelidae

Lilioceris lilii Scop.

L. lilii (Lily beetle) was recorded as a pest in Norway by Chr. Stenseth in 1962. The species is new to our fauna.

Distribution and host plants.
Lilium spp.: VE: Borre 7. and 18.VIII.1962 (i—p).

The first beetles were found in the middle of June 1962 and the next generation in August when they occurred in high numbers. The red-shining beetles feed on the leaves, eating from the edges and/or making holes. The eggs are laid on the leaves and the reddish slime-covered larvae feed on the upper epidermis of the leaf which it skeletonizes in elongated spots. Later, they start to eat holes in the leaves and attack from the edges.

The symptoms of attack are very similar to damage done by the related species *L. merdigera* L. (recorded as a pest in Norway in 1902).

Phyllotreta vittata F.

Ph. vittata was recorded as a pest in Norway by Trygve Rygg in 1960.

Distribution and host plants.
Brassica napus rapifera: AK: Ås 19.V.1960. Os: Fåberg 1.VI.1961; Ø. Gausdal 2.VI.1961. *Brassica napus oleifera biennis:* AK: Ås 13.V. 1960. All finds are imagines.

As with all flea beetles the winter is passed in the adult stage under dead leaves, bark etc. The beetles emerge in early spring and attack cruciferous plants in the seedling stage. They attack the cotyledons and destroy the seedling in the same manner as the more common and important species *P. undulata* Kutsch. and *P. nemorum* L. (known as pests in Norway since 1892).

Aphthona coerulea Geoffr.

A. coerulea was recorded as a pest in Norway by Gudmund Taksdal in 1956.

Distribution and host plants.
Iris sibirica: AK: Ås 29.IX.1956 (i) and 19.VI.1962 (i—p). *Iris pseudacorus:* AK: Ås 19.VI.1962 (i—p).

The damage is done by the adults and there are two periods of attack, the first in the spring, made by the overwintering beetles, and the second in the fall, by the new generation. The beetles feed on the epidermis of the leaves, which they skeletonize in longitudinal stripes. The ends of the leaves seem to be most frequently attacked.

Galerucella nymphaeae L.

G. nymphaeae (Water-lily beetle) was recorded as a pest in Norway by the author in 1955.

Distribution and host plants.
Nymphaea alba: AK: Ås 20.VI.1958 (p) and 29.VII.1958 (i); Drøbak 2.VI.1959 (i). Ry: Hetland 5.VII.1955 (p).

The beetles feed on the leaves of water-lilies, causing rather serious damage by eating numerous holes. The foliage is reduced to bare nerve pattern when heavy attack occurs. Feeding takes place on both sides of leaves that are not submerged. The flowers are also subject to attack, white blossoms in particular.

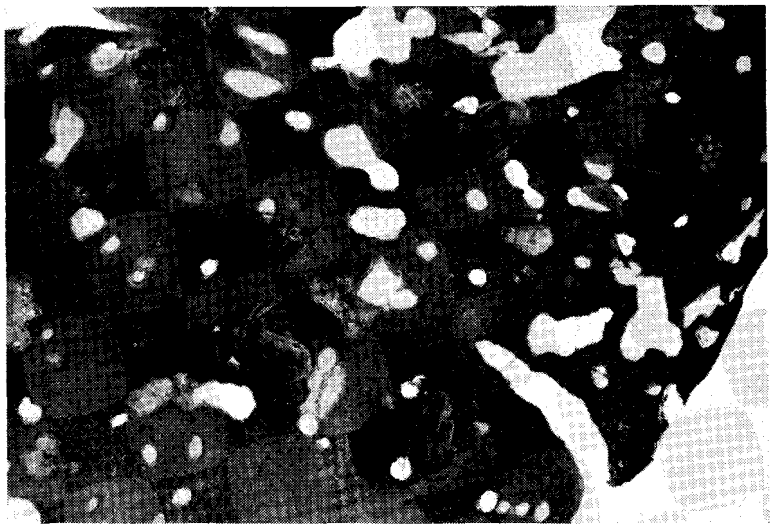


Fig. 6. *Galerucella nymphaeae L.* The beetles eat numerous holes in the leaves of the Water-lily.

Fam. Curculionidae

Otiorrhynchus ovatus L.

O. ovatus (Strawberry root weevil) was recorded as a pest on strawberry in Norway by the author in 1948 (Fjelddalen 1953 b). An attack on spruce was recorded in 1939 by T. H. Schøyen (1943).

Distribution and host plants.

Fragaria x cult.: Ø: Mysen 4.VIII.1960. HEs: Nes 17.VIII.1950. Os: Gjøvik 14.VI.1953; Ringebu 13.VI.1961. Bø: Lier 27.VI. and 29.VII. 1948; 28.VIII.1950; 25.V., 11.VI., 10.VII., 25.VII. and 29.VII.1951; 27.V.1952; 25.V., 1.VI. and 26.VII.1957. VE: Brunlanes 22.VI.1959. AAi: Bygland 21.VI.1951. Ry: Hetland 13.IX.1962. HOy: Meland 25.V. 1954 and 16.VII.1960. MRi: Norddal 1.VIII.1957. TRy: Kvæfjord 1.IX.1958 and 4.VI.1960.

Trifolium pratense: Os: Øyer 11.V.1961. *Tanacetum vulgare:* VE: Borre 6.IX.1962.

Almost all finds were collected by the author as larvae and attacked plants. The larvae were reared to adulthood in the laboratory.

Notes on life history.

The egg is minute and of milky white to pale brown in colour. Most of the eggs are laid by overwintered adults in the spring and early summer and are deposited in or on the soil close to the

plants. Oviposition by these adults may occur the previous year. Most of the larvae pass the winter half-grown at depths of 15—30 cm beneath the strawberry plants. The larval stage usually lasts from July—August to June—July the next year. The duration of the pupal stage occurring in June—July was found to last for approximately three weeks.

The adults emerge from the middle of June to the latter part of July. Some of the adults hibernate among the strawberry plants but evidently most of them seek winter quarters in any suitable spot that will afford protection, in or around the strawberry fields.

Both larvae and adults hibernate, and the life-cycle lasts for two years, although some larvae or some weevils may live for two seasons.

Symptoms of attack and injury.

On hatching, the young larvae at once commence to make their way down to the fine rootlets on which they feed until the approach of winter. After overwintering they also begin to feed on the bark of larger roots. Correlation exists between the size of the larvae and the roots attacked. Examinations of the soil in 1950—52 revealed 15 to 40 larvae beneath each strawberry plant.

Instead of growing vigorously in the spring, the plants appear stunted and the leaves are closely bunched together and assume a dark bluish-green colour. The plants that survive severe attacks produce a poor crop and later in the season many plants wither and die. The symptoms of attack are most striking in connection with hot weather. The attacks were very destructive in 1948—50 and 1952, particularly on plants two to three years old grown in sandy soil.

Small irregular feeding areas on the edges of the leaves indicate the feeding of the adult weevil.

Otiorrhynchus arcticus O. Fabr.

O. arcticus was recorded as a pest on strawberry in Norway by the author in 1959.

Distribution and host plants.

Fragaria x cult.: NNi: Leiranger 9.VI.1959 (l—i). TRy: Kvæfjord 4.VII. and 24.VII.1959 and 4.VI.1960 (l—i).

Our information and observations indicate that the life-cycle is very similar to the life-cycle of *O. ovatus*. The symptoms of attack and damage to strawberry plants are exactly the same. In one case in 1960 the two species *O. arcticus* and *O. ovatus* were found attacking the same plants simultaneously.

O. arcticus was responsible for heavy losses of strawberry plants in northern Norway (between N. latitude $67^1/_2$—69°) in 1959—60.

Otiorrhynchus porcatus Hbst.

O. porcatus was recorded as a pest in Norway by the author in 1956.

Distribution and host plants.

Primula sp.: HOy: Bergen 5.VI.1956 (i). In HOi: Ullensvang 3 specimens were found in October 1962.

On *Primula* grown in greenhouse the larvae were found feeding on the rootlets and the roots and root bark of larger roots. They may also tunnel the crowns. The symptoms of attack and damage resemble those of *O. sulcatus* F. (known as a pest in Norway since 1935).

Coenorrhinus germanicus Herbst.

C. germanicus was recorded on strawberry (*Fragaria x cult.*) by Torgeir Edland in Bø: Lier 20.V.1960 (i).

The species has so far only been observed in one strawberry field in our country but the record is considered important as it is known as a very injurious pest in parts of England and Germany.

The weevil at first feeds in the folds of young leaves, later on petioles and blossom trusses. When laying eggs on the stalks they proceed to make a ring of punctures below where the eggs are deposited and this causes the leaves and blossom trusses to wilt and dry out.

LEPIDOPTERA

Fam. Pieridae

Pieris rapae (L.)

P. rapae (Small white butterfly) is quite common in Norway (Opheim 1958), but in our collection there is no record of its occurrence as a pest before 1954.

Distribution and host plants.

Brassica oleracea capitata: Ø: Rakkestad 28.VII.1954 (l—p). AK: Ås 28.IX.1960 (l—i). *Brassica napus oleifera annua:* VE: Tjølling 17.VII. 1962 (l—p).

Notes on life history.

The life-cycle is very similar to *Pieris brassicae* L., but *P. rapae* lay their eggs approximately 2 weeks earlier, and the eggs are deposited singly (on the underside of the leaves) instead of

in clusters. The larvae, which have a velvety green appearance with a narrow yellow dorsal line, pupate on cruciferous plants, the second generation in sheltered crevices.

The larvae of the second generation in August—September cause most damage.

Symptoms of attack and injury.

The larvae eat from the edges and/or big holes in the outer leaves of cruciferous plants. On cabbage they soon prefer to burrow into the hearts where the damage is particularly objectionable, partly because of the amount of excrement deposited.

Compared to *P. brassicae*, the occurrence is rare and damage rather little so far in our country.

Fam. Noctuidae

Colocasia coryli L.

C. coryli was recorded as a pest in Norway by the author in 1961. The species is otherwise well known to our fauna in the southern parts of Norway (Opheim 1962).

Distribution and host plants.

Fagus sylvatica purpurea: TEy: Solum 23.VII. (l—p) and 7.VIII.1961 (l—i).

The butterflies appear in May—July and the females lay their eggs singly on the food plants. The larvae prefer to feed in sheltered positions. They therefore spin the leaves loosely together and then eat holes or attack the edges more or less indiscriminately. When fully grown the larvae pupate in a wrapped-up leaf.

Rhyacia baja F.

Rh. baja was recorded as a pest in Norway by the author in 1960. The species is quite common throughout nearly the whole country (Opheim 1962).

Distribution and host plants.

Fragaria x cult.: NTi: Frosta, larvae collected 20.V.1960, emergence 20.VI. *Dianthus car.:* SFi: Kaupanger, larvae collected on carnation flowers in greenhouse 8.VII.1960, emergence 20.I.1961.

In the field, the winter is passed in the ground in the larval stage. The larvae are fully fed by June when they pupate in the soil, the adults emerging in July. Injury by *Rh. baja* varies according to the nature of the crop; it shows itself as eating on the leaves and stems of strawberry plants and on carnations as feeding from the outside and hollowing out the buds.

Fam. Plusiidae

Phytometra gamma L.

P. gamma (Silvery Moth) was recorded as a pest in Norway by the author in 1946. The species is well known to our fauna but was very abundant that year and serious attacks on a wide range of food plants occurred.

Distribution and host plants.

Pisum sativum: AK: Oslo 12.IX.1946. Bø: Norderhov 30.VII.1946. VE: Sem 19.VIII.1946. *Trifolium pratense:* AK: Blaker 19.VIII.1946. *Brassica oleracea capitata:* AK: Asker 7.VI.1956. VAy: Søgne 15.VII. 1959. *Daucus carota sativus:* HOy: Sæbø 28.VIII.1946. STi: Strinda 11.IX.1946. *Althaea x cult.:* VAy: Søgne 15.VII.1959. *Gerbera sp.* (in greenhouse): AK: Oslo 29.IX. and 1.X.1951. *Chrysanthemum x hort.* (in greenhouse): VE: Nøtterøy 12.IX.1962 (l—i). *Polygonum tomentosum*: AK: Ås 26.IX. (l) and 8.X.1962 (i).

Almost all finds were collected as larvae and attacked plant material. The larvae were in most cases reared to adulthood in the laboratory.

Notes on life history and injury.

The species is probably unable to hibernate in Norway. The imagines flying early in the summer (May—June) migrate from the south. The mass attacks of the larvae in 1946 occurred particularly in the eastern parts of Norway. The different stages of one generation can develop satisfactorily during the summer in Norway.

When fully grown the larvae pupate in a cocoon between leaves spun loosely together, and the butterflies emerge in August-September.

The most numerous and severe attacks in 1946 occurred on peas and red clover, in several localities the plants were completely defoliated. On greenhouse flower plants the larvae eat on the leaves and flowers, e. g. *Gerbera* where the larvae cut off all the petals.

Occasionally we can expect mass flight and heavy attacks of this species in Norway.

Fam. Tortricidae

Tortrix paleana Hb.

T. paleana was recorded as a pest in Norway by T. H. Schøyen in 1947. Damage caused by larvae of this species has been mentioned as a possibility in the reports of the government entomologists in 1914, 1920 and 1925.

Distribution and host plants.

Phleum pratense: Ø: Rakkestad 16.VI.1952; Degernes 19.VI.1952; Askim 24.VI.1953; Aremark 14.VI.1956; Hobøl 20.VI.1957; Øymark

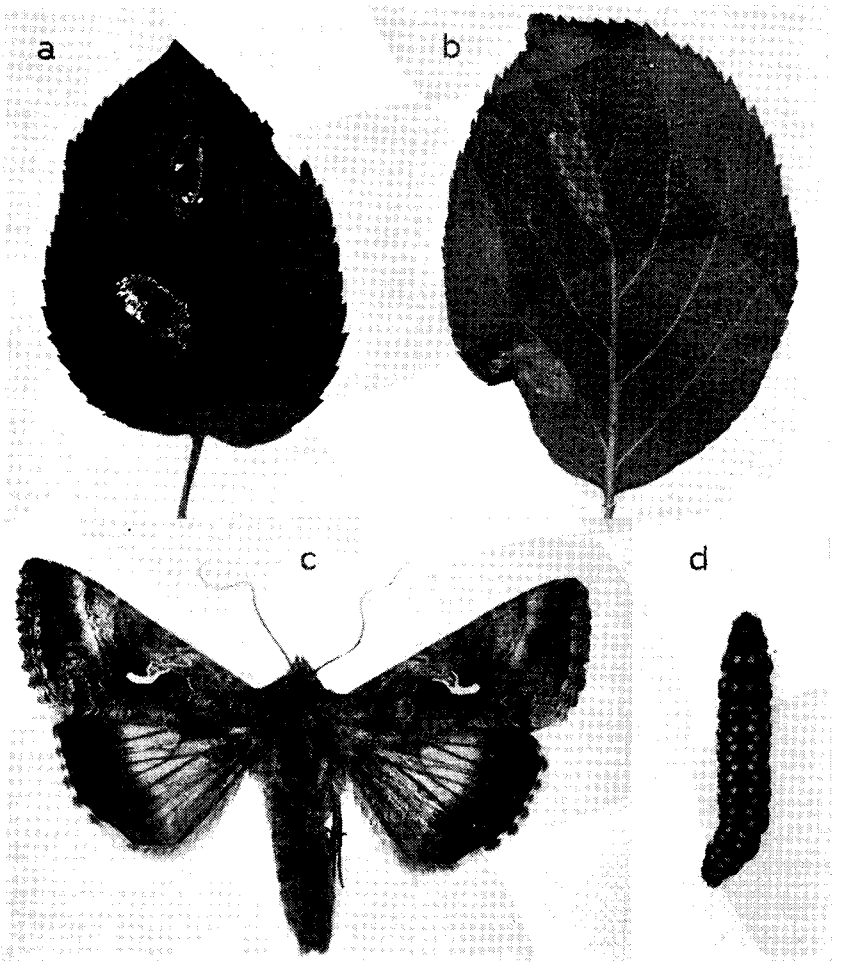


Fig. 7. a) Upper surface of apple leaf showing mines of *Lithocolletis blancardella* F. b) Lower surface showing mines. c) Adult of *Phytometra gamma* L. d) Larva of *Tortrix paleana* Hb.

23.VI.1957; Eidsberg 9.VI.1959; Spydeberg 21.VI.1961. AK: Ås 9.VI. 1953; Nes 17.VI.1960. VE: Borre 23.VI.1953; Sande 25.VI.1954; Tønsberg 17.VI.1956. VAy: Øvrebø 16.VII.1947.

All finds are attacked plant material, in some cases together with larvae which have been reared to maturity in the laboratory.

Notes on life history, symptoms of attack and injury.

Attacks on thimoty grass have normally been observed in the latter part of June every year since 1952. The larvae spin 2—3

of the upper leaves loosely together and feeding is restricted to one surface of the leaves. The other epidermis together with the veins, later turns brown and shrivels. Usually the upper epidermis is destroyed. The attacks continue on new leaves, and when the larvae are very abundant, large areas of grass land may be infested and destroyed, e. g., in Østfold 1952. Pupation occurs on the plants and emergence takes place from July. One generation occurs annually but the stage of hibernation is not known.

In the counties Østfold, Akershus and Vestfold there is reason to expect attacks almost every year.

Cnephasia virgaureana Tr.

C. virgaureana (Flax tortrix moth) was recorded as a pest in Norway by the author in 1954.

Distribution and host plants.

Malus domestica: VE: Sande 17.VI.1954. AK: Oslo 1.VII.1955; Frogn 25.VI.1960. *Fragaria x cult.:* Ø: Rygge 26.V.1961. AK: Nesodden 24.V.1961. Os: Lunner 10.VI.1961. *Brassica oleracea capitata:* Os: Ø. Toten 17.VI.1957. Bø: Lier 27.VI.1955; 15.VI.1960; Norderhov 15.VI. 1956. *Brassica o. botrytis:* AK: Frogn 4.VI. 1960. *Rosa rugosa:* AK: Ås 7.VI.1961.

All records are finds of larvae and attacked plant material. The larvae were reared to maturity in the laboratory.

Notes on life history.

The adults appear in July—August. Yellow-green eggs are deposited singly on stems or leaf stalks, occasionally, also on the leaves. The eggs hatch after about a fortnight and hibernation occurs as young larvae inside a cocoon. The following spring in May the larvae start attacking the plants and they reach maturity after approximately 4 weeks. They pupate between webbed leaves and the moths emerge 2—3 weeks later in June—July.

Symptoms of attack and injury.

After hibernation the larvae, e. g., on early cabbage, mine a little in the leaves but soon they spin young leaves together and feed from this sheltered position. Later they prefer to burrow into the heads where the damage is particularly objectionable. Usually, there is only one larva on each plant. On strawberry, the leaves are rolled together.

The species is very polyphagous but must be considered an important pest mainly on cabbage. In 1955—56 heavy outbreaks occurred in most of our cabbage-growing areas in the south-eastern parts of Norway.

Fam. Ecosmidae

Enarmonia woeberiana Schiff.

E. woeberiana (Bark tortrix moth) was recorded as a pest in Norway in 1954.

Distribution and host plants.
Malus domestica: HOi: Ullensvang VIII. 1962 (i). *Pyrus com. cult.:* SFi: Leikanger 20.V.1954, VII.1961 (l—p). HOi: Ullensvang VIII.1962 (i). *Prunus x effusa:* HOi: Ullensvang VIII.1962 (i).

The eggs are deposited in crevices and cracks on the bark. The larvae cause damage by burrowing into the bark and the surface of the wood, forming short irregular tunnels. They generally attack the trunk more frequently near the base and successive generations of larvae use the same tunnels. Brown, granulary excrement pushed out through the tunnel, indicates the attack. The larvae which pass the winter in the tunnels work their way close to the bark before they develop into a chrysalis inside a cocoon.

The species is not an important pest in our country. Real damage has so far been confined to old pear trees.

Fam. Lithocolletidae

Lithocolletis blancardella F.

L. blancardella was recorded as a pest in Norway by the author in 1951.

Distribution and host plants.
Malus domestica: AK: Asker 11.VIII.1958; Ås 1.IX. (l—p) and 20.IX. 1961 (i). Os: Fåberg 12.VII.1960. Bø: Lier 10.XI.1961; Modum 14.VIII. 1962. TEy: Gjerpen 17.VIII.1962. TEi: Kviteseid 21.VII.1961. AAy: Fjære 15.VII.1961. HOi: Ullensvang 21.IX.1954 and 7.XI.1960; Kinsarvik 28.VII.1957 and 12.X.1961. SFi: Leikanger 27.IX.1951 (on the varieties Filippa, Bramley Seedling and James Grieve) and 13.VIII.1961.

All finds include attacked plant material with larvae in the mines.

Notes on life history and symptoms of attack.
The larvae mine just under the surface on the underside of the leaves. The mine is stretched and pointed at the ends and is usually situated between the side veins. On the upper surface the mine is perforated which shows as light dots; the underside is covered by a thin yellow-brown folded membrane. The larvae pupate in the mine and there are probably two generations annually.

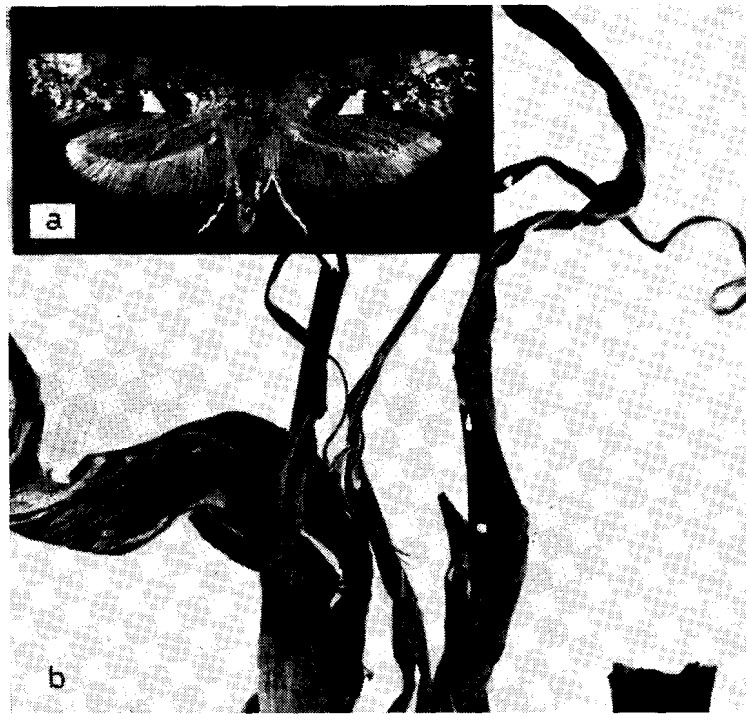


Fig. 8. a) Adult of *Acrolepia assectella* Zell. b) Leaves of leek heavily damaged by the larvae.

Several mines may be found in one leaf. They are very conspicuous and are present from the end of June until leaf-fall. The species cause very little harm in the southern and eastern parts of the country, but in the western parts local attacks have occasionally been of some importance.

Fam. Acrolepidae

Acrolepia assectella Zell.

A. assectella (Leek moth) was recorded as a pest in Norway by T. H. Schøyen in 1949, not in 1943 as previously reported by Fjelddalen et al (1960). The only find previously known to our fauna is a specimen in the collection of the Zoological Museum, Oslo, collected at lat. 70°N in Alta in 26. VI. 1924 (leg. Barca). The only record mentioned by Haanshus (1933) is from Hordaland but the author has not been able to localize any specimens.

Distribution and host plants.

Allium ampeloprasum porrum: Ø: Fredrikstad 15.VIII.1961 and 28.IX. 1962; Skjeberg 24.VIII.1961. VE: Tønsberg 29.VIII.1957; Stokke 17.IX.1959; Larvik 27.VI.1960. TEy: Solum 11.IX.1949; Seljord 27. IX.1950. Ry: Stavanger 18.XI.1960. *Allium cepa:* AK: Ås 24.VIII.1962 and VE: Stokke 20.VIII.1960. *Allium schoenoprasum:* VE: Stokke 20.VIII.1959.

Most of the finds are larvae and attacked plant material. In several cases the larvae have been reared to adulthood in the laboratory.

Notes on life history.

The first generation of larvae (from late May to early July) from insects hibernating as imago is not very numerous; the second generation occurs in much greater numbers. The eggs of the latter generation are laid on the upper side of the leaves in July—August. Pupation commences in September and the first imagines appear in the last week of September. In onion store-houses, larvae and pupae as well as imagines have been observed throughout October and imagines could be found throughout the winter.

Symptoms of attack and injury.

All attacks start with small mines in the leaves. On the leek the larvae quickly make for the neck of the plant, where they feed until the leaves become full of holes and split when the larvae emerge. Also on chives, feeding is concentrated on the lower parts of the leaves. On the cepa onion, the larvae enter the hollow leaves, where they remain for as long as the leaves stay green. As the leaves wilt the larvae attack the onion itself, boring through the outer dry scales. Even very small feeding areas lead to considerable damage since these wounds serve as entrances for the decay-producing organisms.

In 1959 the attacks were partly quite heavy in several localities in the south-eastern coastal districts.

DIPTERA

Fam. Itonididae (Cecidomyiidae)

Diarthronomyia chrysanthemi Ahlb.

D. chrysanthemi (Chrysanthemum gall midge) was recorded as a pest in Norway in 1949 on chrysanthemums in greenhouse (Gjærum 1949). The species is new to our fauna. There is reason to believe that the species was introduced by infested chrysanthemum cuttings or rooted plants.

Distribution and host plants.
Chrysanthemum x hortorum: AK: Oslo 15.X. and 15.XI.1949 (p—i).

Notes on life history.
The adult midge lays its eggs in groups on the top of the new growth, usually in the buds and among the folds of the very young leaves. The tiny reddish-orange larvae bore into the plant tissue, on which they feed, and a definite gall develops later. The pupation occurs inside the gall and at the end of this period the pupa pushes itself half-way out of the gall and the adult fly emerges. Breeding goes on continuously throughout the year in greenhouses and there are several overlapping generations per annum. The population can be very large in the late summer. The length of the life-cycle varies with the temperature.

Symptoms of attack and injury.
At the onset of an infestation, greenish blister-like galls develop on affected plants. Later, as the galls mature, they take on a cone-shaped appearance and project obliquely from the surface. In a slight attack the galls are usually scattered over the upper surface of the leaves but with severe infestation the galls are found on both sides of the leaves and on the stem, buds and calyxes as well. The leaves can be badly distorted, the stems swollen, twisted and deformed, and the flower buds sometime fail to open or they produce badly-shaped blossoms.

The chrysanthemum gall midge is considered a very serious pest on greenhouse chrysanthemum.

Dasyneura tetensi (Rübs.)

D. tetensi (Black currant leaf midge) was recorded as a pest in Norway by the author in 1948 on black currant (Fjelddalen 1954). The species is new to our fauna.

Our observations have shown that the distribution and the economic importance of this pest have increased progressively. Since 1953 heavy outbreaks on black currant have occurred every year.

Distribution and host plants.
Ribes nigrum: HEs: Nes VII.1948; 15.VIII.1948; 2.IX.1953 and 9.IX. 1953; Ringsaker 20.VIII.1954 and 29.VIII.1962; Hamar 30.VII.1957. Os: N. Land 2.VI.1960; Ø. Toten 12.VII.1960 and 30.VIII.1962; Fåberg 12.VII.1960. Bø: Modum 14.VIII.1962. TEy: Holla 21.VII.1961; Gjerpen 17.VIII.1962. AAy: Fjære 14.VII.1959 and 15.VII.1961. Ry: Stavanger 16.VII.1959; Madla 30.IX.1956; 20.IX.1957 and 16.VII.1959; Høyland 29.IX.1953; 19.IX.1957 and 6.X.1959. Ri: Hjelmeland 17.VII.1959. HOi: Kvam 9.VIII.1960. SFi: Sogndal 9.VII.1960. STi: Strinda 5.IX. 1953. NTi: Stjørdal 16.VIII.1959 and 20.VI.1961; Inderøy 31.VII. 1961; Skogn 28.VIII.1958; 20.VI.1961 and 27.VI.1961.

Fig. 9. The terminal growth of black currant damaged by the larvae of *Dasyneura tetensi* (Rübs.).

Most of the finds have been collected by the author as attacked plant material with larvae.

A record on *Ribes cult. leucocarpum* (AAy: Fjære 15. VII. 1961) may be another species.

Notes on life history.

The small whitish eggs are deposited between the folds on very young leaves at the tips of growing shoots, from the latter parts of April or in May. On an average, 4 to 5 larvae feed in the folds of the upper surface of the leaves. The larval stages last approximately 2 weeks. When they have completed their feeding they fall to the ground, where they pupate in silken cocoons a few cm. below the surface. The observations made showed 2 to 3 generations annually, the larvae appearing during May—June, July—August and in September.

Symptoms of attack and injury.

The injury caused prevents the infested region of the leaves from growing as fast as does the lower surface. The leaves continue to grow but will always remain folded and crumpled. In nurseries the leaves get curled and twisted and the terminal growth turns brown and withers. The symptoms on bushes were visible the second week of May, in nurseries, the first week of June.

Black currant leaf midge is now undoubtedly a very serious pest in our country, especially in nurseries.

Dasyneura alpestris Kieff.

D. alpestris (Arabis midge) was recorded as a pest in Norway by the author in 1956 (Fjelddalen 1957 b).

Distribution and host plants.
Arabis alpina: AK: Asker 27.X.1956 (l—p).

Notes on life history.
According to Barnes (1948) the red eggs are deposited in the leaf buds among the hairs of the leaves. The red larvae remain in the gall made throughout their feeding period. When fully grown they pupate either inside the gall or in the soil. In many galls as many as 20 larvae were found. Annually, 3—4 generations may occur.

Symptoms of attack and injury.
The base of the leaves in the terminal and central growth becomes swollen, enlarged and contracted, forming a compact open gall. The leaves beneath the gall are shorter and thicker than normal leaves, and more curved and hairy. Weak side shoots develop but the plant will often be completely destroyed. When the attack occurs just as flowering is developing, the result is a very malformed and stunted flowering stem.

Dasyneura tiliamvolvens (Rübs.)

D. tiliamvolvens was recorded in Norway by the author in 1954.

Distribution and host plants.
Tilia cordata: AK: Ås 31.V.1954. HEs: Nes 29.VI.1959. Os: Ø. Toten 12.VII.1960. *Tilia platyphyllos:* Ø: Råde 1.VI.1961.

All finds were collected from ornamental trees and include attacked plant material and larvae.

The edges of the leaves are rolled upwards and the upturned part becomes thicker and yellowish-green coloured. Attacked young leaves acquire a violet colour.

The species is of little importance as a pest.

Physemocecis hartigi (Liebel)

P. hartigi was recorded in Norway by E. Sylvén in 1959.

Distribution and host plants.
Tilia cordata: AK: Bærum 27.VI.1959. TEy: Sannidal 12.VII.1959. Ri: Hjelmeland 3.VIII.1959. *Tilia platyphyllos:* AK: Asker 20.VI.1960; Ås 6.VII.1960.

All finds were collected from ornamental trees and include attacked plant material and larvae.

The galls are circular, flattened, only barely projecting on both the upper and lower surfaces of the leaves. The colour is normally light surrounded by a red circle.

The species is of little importance as a pest.

In our collection we have samples of attacked plant material of two other species of gall midges attacking *Tilia: Contarinia tiliarum* (Kieff.) found in 1892 and *Didymomyia reamuriana* (Loew.) found in 1895 by W. M. Schøyen (not previously published).

Dasyneura fraxinea Kieff.

D. fraxinea was recorded in Norway by the author in 1959.

Distribution and host plants.

Fraxinus excelsior: AK: Bærum 27.VI.1959. HEs: Nes 28.VI.1960. TEy: Solum 4.VII. and 13.VII.1959. AAy: Froland 17.VII.1961. Ri: Hjelmeland 16.VII.1959. HOy: Ølen 29.IV.1960.

All finds were collected from ornamental trees and include attacked plant material and larvae.

The galls are circular, flattened and pustule-like malformations 6 mm in diameter. The colour is first greenish-brown with a light-brown circle, later dark-brown on both sides. On the lower surface, there is a rounded opening. At maturity, the galls do not fall to the ground as previously mentioned by some authors.

The species is of little importance as a pest.

Dasyneura fraxini (Kieff.)

D. fraxini was recorded in Norway by E. Sylvén in 1959.

Distribution and host plants.

Fraxinus excelsior: AK: Bærum 27.VI.1959. AAy: Froland 17.VII.1961. SFi: Årdal 16.VII.1959.

All finds were collected from ornamental trees and include attacked plant material and larvae.

The galls are reddish pouch-shaped local swellings of the mid-vein of the leaflets. When the gall reaches maturity a longitudinal slit is formed on the upper surface and a pocket-like expansion on the under surface.

The species is of little importance as a pest.

Thomasiniana theobaldi Barnes.

Th. theobaldi (Raspberry cane midge) was recorded in Norway in 1959 (Valset 1960). The species is new to our fauna.

Distribution and host plants.

Rubus idaeus: AK: Asker 1.IX.1959. Os: V. Toten 24.VIII.1960. VE: Tønsberg 28.VIII.1960.

The finds are attacked plant material and larvae.

Notes on life history.

The larvae overwinter in cocoons in the soil surface. Very soon after emerging the female midges lay their eggs under broken epidermis. Natural splitting of the epidermis and of the outer cortical tissues of the cane provides a suitable shelter for the eggs and larvae. The pinkish larvae living in colonies feed under the rind and when fully fed fall to the ground and make their cocoons in the soil at the base of the cane. Two or three generations may occur annually. The larvae of the last generation in August—September have been very numerous.

Symptoms of attack and injury.

Rind flaking or peeling of the canes takes place and conspicuous dark brown areas form underneath. The tissues injured by the larvae are often attacked by fungal pathogens.

The raspberry cane midge must be considered an important pest. The direct damage to the plant is not grave but the feeding habits of the larvae render the cane liable to invasion and injury by certain important fungus diseases.

Sitodiplosis mosellana (Geh.)

S. mosellana (Wheat blossom midge) was recorded as a pest in Norway by the author in 1960. The species is considered new to our fauna in spite of the record given in the annual report by the government entomologist in 1916 under the synonym *Cecidomyia aurantiaca* (cited by Barnes 1956). The description of the attack and the numbers of larvae indicate the closely related species *Contarinia tritici* Kir.

Distribution and host plants.

Triticum vulgare: Ø: Mysen 11.VIII.1960. AK: Ås 24.VIII.1960. HEs: Stange 7.IX.1962. NTi: Inderøy 25.VIII.1960.

The finds include attacked plant material and larvae.

Notes on life history.

The larvae hibernate in the soil; pupation occurs in the spring and the adults emerge when the ears of wheat are formed. The females lay 1—2 eggs at the tip of the husk covering the soft kernel. The larvae mature before the grain hardens (after ca. 3 weeks) and drop to the ground where they make a cocoon in the soil and over-winter.

Symptoms of attack and injury.

Usually a solitary larva feeds on the face of the kernel, while those of the far more common species *Contarinia tritici* Kir. are found among the anthers and pollen at the top of the kernel. The feeding results in shrunken grains. The primary effect of an infestation is a reduction in the number of well-formed grains and an increase in the number of small-sized ones.

Attack by *S. mosellana* may be of importance in the areas where cereals are grown in monoculture.

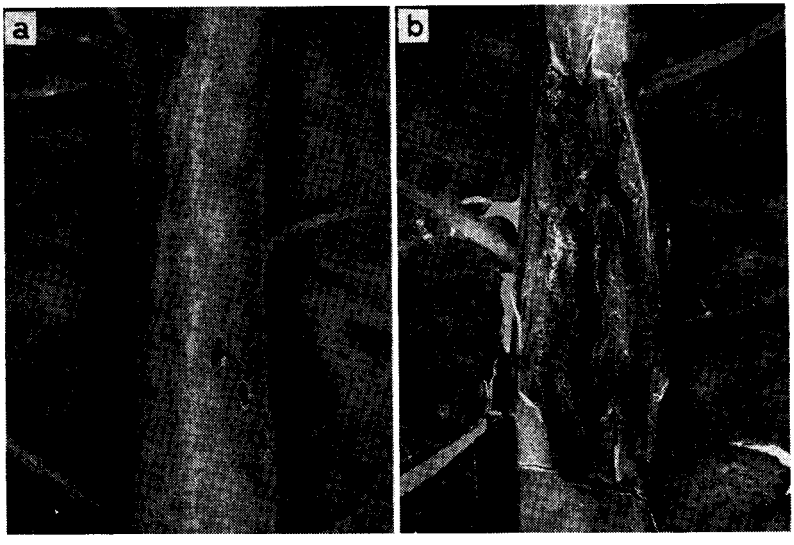


Fig. 10. *Phytomyza rufipes* Meig. a) Exit holes of larvae in the main vein of a cauliflower leaf. b) The vein split open to show the larval tunnels.

Fam. Agromyzidae

Phytomyza rufipes Meig.

P. rufipes (Cabbage leaf miner) was recorded as a pest in Norway in 1960.

Distribution and host plants.

Brassica oleracea botrytis: Os: Ø. Toten 29.VIII.1962. VE: Stokke 26.VI.1962. NTi: Stjørdal 6.VIII.1960. *Brassica o. capitata:* VE: Sandar 17.VII.1962. TEy: Holla 18.VI.1962.

The finds include attacked plants, larvae and imagines.

Notes on life history.

There appear to be two generations annually, the second being the most numerous. Characteristic feeding punctures which the females make with the ovipositor were observed near the margins of the upper surface of the leaves. The eggs are laid in similar "cavities" but preferably on the under-surface. The small mining larvae live mostly in the mid-vein. They pupate in the leaves or in the soil (l. gen.). The winter is passed in the pupal stage in the soil.

Symptoms of attack and injury.

The young larva tunnels a small mine to the nearest side vein and, further, to the main vein just beneath the epidermis. Several larvae occur together and the damage is soon visible

on the exterior. The vein shows narrow lines of sunken and blackened tissue. The symptoms of attack are similar to attack by the larvae of *Ceuthorrhynchus quadridens* Panz. Occasionally, the larvae can be found in the stem and growing points of young plants.

The attacks in 1960—62 were rather severe locally.

Phytomyza ilicis Curt.

P. ilicis (Holly leaf miner) was recorded as a pest in Norway by T. H. Schøyen in 1949.

Distribution and host plants.

Ilex aquifolium: AAy: Lillesand 19.VI.1961. Ry: Stavanger 7.XII. 1953; 16.VII.1959; 28.VIII.1960 and 14.IX.1962; Haugesund 28.IV.1962. HOy: Fana 11.VI.1962; Os 10.IX.1962. HOi: Strandebarm 17.VII.1960. MRy: Volda 7.IV.1949; Ålesund 18.VI.1953 and 6.IX.1957; Molde 18. VIII.1959.

The finds include attacked plant material and larvae.

The larvae, which hatch from eggs deposited on the underside of young leaves, mine in the leaf. Each mine is winding and narrow, but gradually it increases in width as the larvae develops. The mines are plainly visible on the upper leaf surface, where the mined tissue turns to yellowish-green and brown, sometimes purple. The foliage on seriously infested trees (shrubs) appears unhealthy and somewhat faded.

The holly leaf miner is widely distributed along the southern and western coast line, doing rather serious damage, especially in Rogaland, Hordaland and Møre and Romsdal.

Pegomyia rubivora Coq.

P. rubivora (Loganberry cane fly — Raspberry cane fly) is mentioned as a pest on raspberry in Norway by Schøyen and Jørstad (1942) but in our collection there is no record of its occurrence as a pest before 1947. An old sample of attacked plant material kept since 1909 (col. W. M. Schøyen, VAy: Kristiansand) was identified in 1953 as attacked by *P. rubivora.*

In the annual reports by the government entomologists, attack by a dipter-larvae in raspberry canes is mentioned in 1900, 01, 03, 09, 11, 20, 25 and 1929. It is assumed that the attacks were due to the larva of the raspberry cane fly. An attack occurring in 1900 is probably the first record of raspberry cane fly attack in Norway (Kobro 1903).

Distribution and host plants.

Rubus idaeus: Ø: Askim 19.VIII.1958. AK: Nesodden 18.VI.1952; Bærum 5.VI.1953; Oppegård 26.IX.1953; Oslo 28.V.1959 and 13.VI. 1959; Holstad 27.VI.1962. HEs: Kongsvinger 18.VI.1958. Bø: Norderhov 25.V.1960. VE: Sandefjord 12.VI.1958. TEy: Drangedal 6.VI.1953.

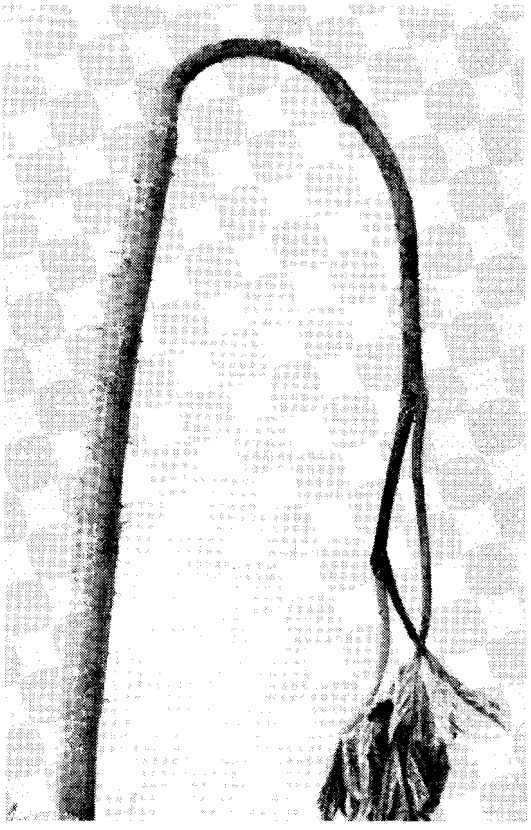


Fig. 11. Cane of raspberry attacked by a larva of *Pegomyia rubivora* Coq.

AAy: Eydehamn 12.IX.1952; Birkenes 8.VI.1953; Risør 7.V.1957. VAy: Kristiansand 5.VI.1953. Ry: Hetland 3.VI.1948. Ri: Hjelmeland 8.VI. 1960. HOy: Bergen 18.VI.1952. SFy: Gloppen 21.VI.1954; Førde 30.VI. 1954; Brekke 22.VII.1954. MRy: Vestnes 7.VII.1949. MRi: Sunndal 7.VII.1956. STi: Trondheim 10.VII.1947; Leinstrand 11.VII.1957. NTi: Inderøy 23.VI.1953; Frosta 30.VI.1962. Nsi: Nord-Rana 17.VII.1961.

The finds are attacked plant material mostly from cultivated raspberry plants; in some cases from wild plants. Rearing of larvae to adulthood has been carried out.

Notes on life history.

The adults appear in May and lay their eggs in the axil of a terminal leaf of the new canes. Usually only 1 or 2 eggs are deposited on each cane. The whitish larvae live in the tip of the

new canes working downwards 10—14 cm where they make a circular mine just below the epidermal layer of cells, thus severing the vascular tissue. Pupation takes place in the soil, sometimes also in the hollowed-out canes.

Symptoms of attack and injury.

The attack results in the wilting and death of the growing tip which often breaks off where the initial girdling has occurred. Before wilting, the tip often gets a bluish colour.

Gall-like swellings or circular galls have been observed on the canes several times of recent years. This less known damage is also caused by the larvae of raspberry cane fly. The galls are easily distinguished from the galls of raspberry stem gall midge (*Lasioptera rubi* Heeg.) by shape and size.

The raspberry cane fly is considered an important pest on raspberry in Norway. Heavy attacks occur locally every year in gardens and nurseries.

HYMENOPTERA

Fam. Argidae

Arge ochropus (Gmelin). (Syn. *Hylotoma rosae* L.).

A. ochropus (Large rose sawfly) was recorded as a pest in Norway by the author in 1953.

Distribution and host plants.

Rosa sp.: AK: Oslo 5.VI.1957 and 11.VII.1958. HEn: Trysil 29.VII. 1954. VE: Sem 17.VI.1953. TEi: Heddal 18.VII.1959. SFi: Leikanger 29.VI.1957 and MRy: Skodje 18.VII.1959.

All finds were collected by the author as larvae and attacked plant material.

The adult female makes rows of incisions on the young shoots and flower stalks of roses and places an egg in each. The injured part becomes discoloured and often distorted. When the larvae hatch they commence feeding on the foliage. The damage consists of cleancut holes on the leaves or on the edges.

Fam. Tenthredinidae

Athalia rosae (L.)

A. rosae (Turnip saw fly) was recorded as a pest in Norway by the author in 1950.

Distribution and host plants.

Brassica napus rapifera: Ø: Skjeberg 10.VII.1956. AK: S. Høland 7.VII.1960. HEs: Vang 28.VI.1960. Os: Ringebu 18.VI.1960 and 1.VI. 1961. Bø: Lier 11.VII.1956. TEi: Gransherad 25.VII.1956. AAy: Grimstad 31.VIII.1950; Landvik 22.IX.1950; Fjære 22.IX.1950. VAy: Mandal 19.VII.1960.

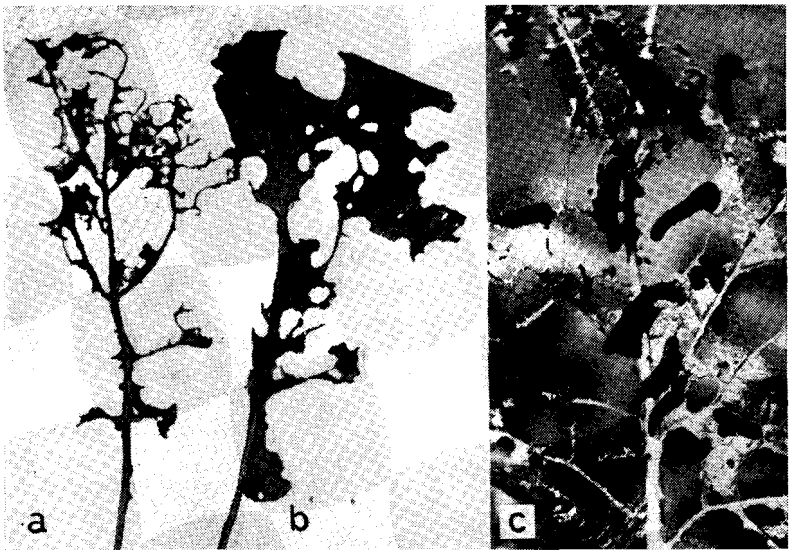


Fig. 12. Cruciferous leaves heavily damaged by the larvae of *Athalia rosae* (L). (c — Photo K. Kanervo).

Brassica rapa rapifera: Ø: Rakkestad 4.IX.1955; Halden 5.IX.1955. AK: Hurdal 30.IX.1955; Ski 2.IX.1959; S. Høland 5.VIII.1959. HEs: Brandval 3.IX.1955; Nes 14.VII.1956 and 28.VI.1960; Elverum 4.VIII. 1959. HEn: Engerdal 19.VIII.1959. Os: Fåberg 12.VII.1960. Bv: Ål 3.IX.1959. SFy: Førde 9.IX. and 7.X.1959. MRy: Tingvoll 9.X.1959. NTi: Meråker 4. and 8.VIII.1956; Klinga 7.IX.1959.

Brassica oleracea: AK: Nannestad 8.VIII.1956. HEs: Stange 22.VI. 1960. Os: Sør-Fron 1.VIII.1956. NTi: Stjørdal 7.VIII.1956.

Brassica rapa oleifera: Ø: Spydeberg 27.VII.1956. AK: Nes 17.VII.1960 and 1.VIII.1960.

Sinapis alba: Ø: Spydeberg 27.VII.1956; Tune 12.VII.1956.

Raphanus sativus: Os: Gran 16.VII.1960. VE: Sem 1.IX.1955. Fn: Tana 22.VII.1956.

All finds are larvae and attacked plant material and in some cases imagines. Larvae were reared to adulthood in the laboratory.

Notes on life history.

The adults appear in the early days of June and the female deposits her eggs singly along the leaf margin on the underside, embedded in the epidermis. More than a hundred eggs can be laid by one female, arranged along the leaf edge at irregular intervals. The eggs hatch in 9—10 days. The larval stage lasts about 4—5 weeks and the full-grown larvae descend 2—5 cm into the soil where they pupate, forming a cocoon covered with

soil particles. The pupal stage lasts about 3 weeks and there are usually two generations a year. When the average temperature is high a third generation may occur. This was confirmed by hatching observations in 1959. The winter is passed in a cocoon and pupation takes place the next spring.

Symptoms of attack and injury.

The young larvae feed at first gregariously on the leaf epidermis and eat small holes in the leaves. Later as the larvae grow larger they become very voracious. Young plants may be eaten completely and only the stalks and veins of older plants are likely to remain.

The first generation is less numerous and troublesome than the second generation which may be very abundant; the larvae then destroy the plants in a few days. Heavy outbreaks occur periodically, e. g. 1955 and 1959, on turnip and on young swede plants grown for seed.

Since the turnip sawfly was recorded 13 years ago it has become widely and commonly distributed in South-Norway. The most northern locality is Fn: Tana (N. latitude 70,4°).

Parna tenella (Klug.)

P. tenella was recorded as a pest in Norway by the author in 1962. Identification is based on attacked plant material.

Distribution and host plants.

Tilia cordata: TEy: Gjerpen 17.VIII.1962 (p).

The larvae mine in the leaves. The mines are of the blotch-type and visible on both sides of the leaf. They are usually found along the margins but may occupy a considerable area, often to the mid-vein. The leaves will fold over and form a roll which was the case with more than 50% of the leaves found in the recorded attack on young nursery plants of linden.

Pristiophora abbreviata Htg.

P. abbreviata was recorded as a pest in Norway by the author in 1952. Identification is based on larvae and attacked plant material.

Distribution and host plants.

Pyrus com. cult.: Bø: Modum 16.IX.1953. VE: Sande 18.VI. and 4.VIII. 1953. SFy: Gloppen 27.VI.1952. MRi: Norddal 2.VII.1952 and 16.VI. 1954. All finds are collected by the author.

The larvae attack the pear leaves in June and the first part of July. They eat clean-cut round holes in the leaves and later they attack from the edges. A close examination will show the green larvae stretched along the edge of each hole when feeding.

The species is of minor importance as a pest.

References

BARNES, H. F., 1948: Gall Midges of Economic Importance IV: 24—29.
— 1956: Gall Midges of Economic Importance VII: 57—81.

FJELDDALEN, JAC., 1953a: Korstrips (*Parthenothrips dracaenae*) — Gartneryrket *43* (26): 479

— 1953b: Rotsnutebille på jordbær, *Otiorrhynchus ovatus*. — «Frukt og Bær» *6:* 65—75.

— 1954: Gallmygg og gallmidd på frukt og bær. — «Frukt og Bær» *7:* 37—48.

— 1955: Jordbærmjøllus, *Aleyrodes fragariae* Walk. — «Frukt og Bær» *8:* 17—21.

— 1957a: Bregneskjoldlus, *Pinnaspis aspidistrae* (Sign.). — Gartneryrket *47* (17): 325—326.

— 1957b: Arabisgallmygg (*Dasyneura alpestris* Kieffer). Et nytt skadedyr for Norge. — Gartneryrket *47* (8): 137.

— 1958: Sterke angrep av skadedyr på korn og gras i 1956. — Tidskr. f. Det Norske Landbruk *65* (4): 66—83.

FJELDDALEN, JAC., AUSLAND, O. og RYGG, T., 1960: Purremøll (*Acrolepia assectella* Zell.). Et nytt skadedyr på løk og purre. — Gartneryrket *50* (21): 448—451.

GJÆRUM, H. B., 1949: Krysantemum-gallmyggen funnet i Norge. — Gartneryrket *39* (46): 963—964.

HAANSHUS, K., 1933: Fortegnelse over Norges Lepidoptera. — Norsk Ent. Tidsskr. III (3): 164—216.

HERSTAD, B., 1960: Opplysninger om forekomst av trips (*Thysanoptera*) i Norge. — Norsk Ent. Tidsskr. XI. (3—4): 145—149.

KOBRO, H., 1903: En nye Fiende paa Bringebærbusken? — Norsk Havetidend *19:* 165.

LEATHERDALE, D., 1959: The Plant Galls of Norway. — Univ. i Bergen, Årbok 1959, Naturvit. rekke Nr. 8 (56 pp.).

OPHEIM, M., 1958: Catalogue of the Lepidoptera of Norway, Part I, Rhopalocera, Grypocera, Sphinges and Bombyces. — Publ. by Norsk Ent. Forening, Oslo (26 pp.).

— 1962: Catalogue of the Lepidoptera of Norway, Part II, Noctuidea. — Ibid. (32 pp.).

RAMSFJELL, T. og FJELDDALEN, JAC., 1962: Sjukdommer og skadedyr på jordbruksvekster. — Oslo (196 pp.).

SCHØYEN, W. M., 1891—1912: Beretning om Skadeinsekter og Plantesygdomme i Land- og Havebruget. — Printed in Aarsberetn. fra Landbrugsdir. 1892—1913. Kristiania (Annual reports by the government entomologist).

SCHØYEN, T. H., 1913—1939: Beretning om skadeinsekter i land- og havebruket. — Printed in Landbruksdirektørens årsberetning 1914—1941, Oslo. (Annual reports by the government entomologist).

— 1943: Melding om skadeinsekter på skogstrærne i 1936—41. — Printed in Skogdirektørens årsmelding 1941, Oslo.

SCHØYEN, T. H. og JØRSTAD, I., 1942: Skadedyr og sykdommer i frukt- og bærhagen, Oslo (136 pp.).

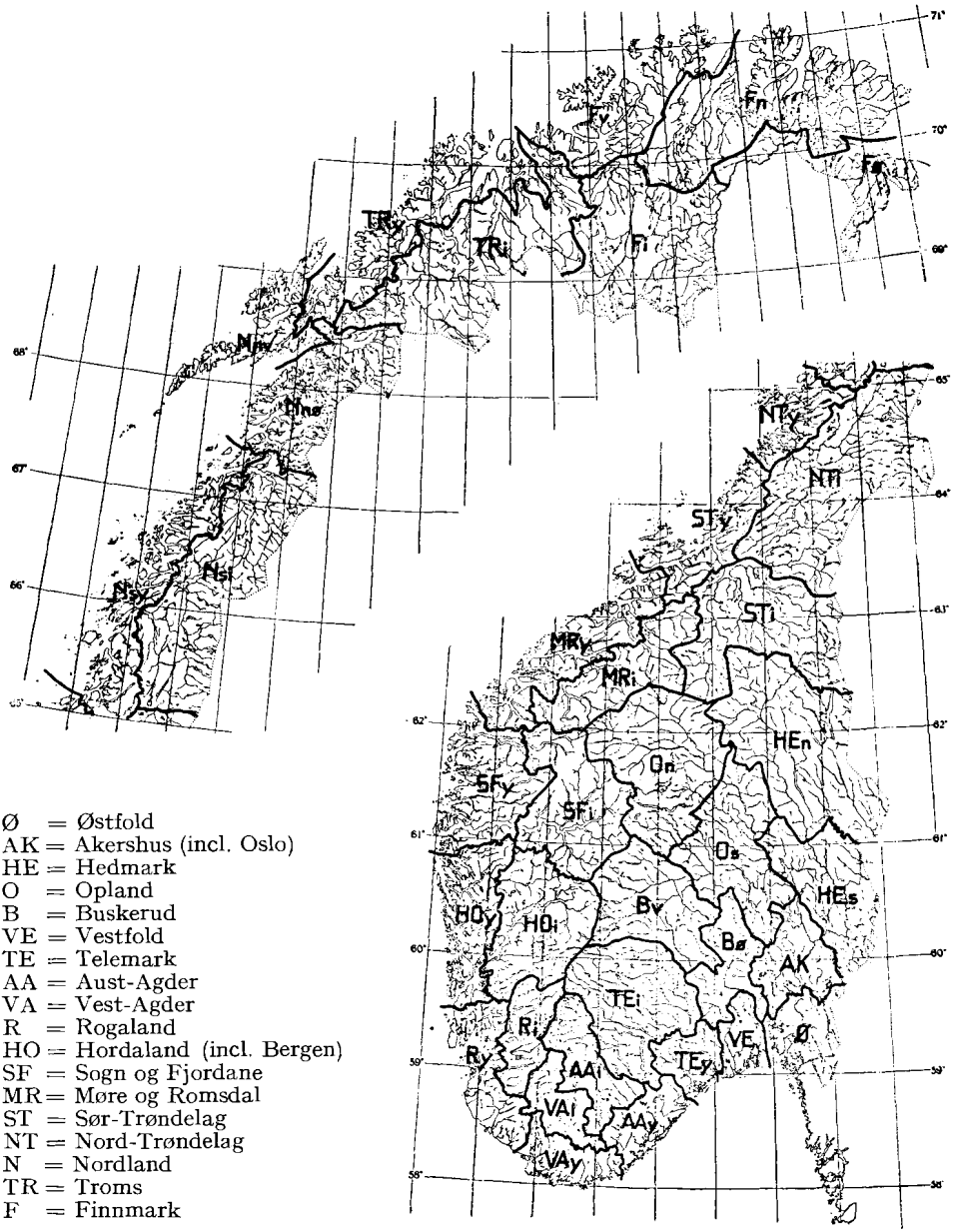
STRAND, A., 1943: Inndeling av Norge til bruk ved faunistiske oppgaver. — Norsk Ent. Tidsskr. *VI.* (4—5): 208—224.

— 1960: Norvegica. In C. H. Lindroth (ed.), Catalogus Coleopterorum Fennoscandia et Daniae, Lund.

THOMAS, I. and JANSON, H. W., 1957: Common Names of British Insects and other Pests. — Tech. Bull. No. 6, Her Majesty's Stat. Office, London (49 pp.).

THORSRUD, A. and REISÆTER, O., 1948: Norske plantenavn, Oslo (276 pp.).

VALSET, K., 1960: Bringebærbarkgallmyggen (*Thomasiniana theobaldi* Barnes). Et «nytt »skadedyr hos oss. — «Frukt og Bær» *13:* 37—41.



Ø = Østfold
AK = Akershus (incl. Oslo)
HE = Hedmark
O = Opland
B = Buskerud
VE = Vestfold
TE = Telemark
AA = Aust-Agder
VA = Vest-Agder
R = Rogaland
HO = Hordaland (incl. Bergen)
SF = Sogn og Fjordane
MR = Møre og Romsdal
ST = Sør-Trøndelag
NT = Nord-Trøndelag
N = Nordland
TR = Troms
F = Finnmark

Fig. 13. Map showing the districts of Norway with explanation of the abbreviations used in the paper. The districts are subdivided in zones; i (inner), y (outer), n (northern), s (southern), v (western) and ø (eastern).
See Norsk Ent. Tidsskr. VI (4—5): 208—224, 1943.

Comacla senex Hb. funnet i Norge (Lep., Arctiina)

Av Per O. Seglen

I en samling insekter som ble sendt meg våren 1961 av hr. Kristen Dale, Dale pr. Byglandsfjord (AAi), fantes ett enkelt eksemplar av den vesle arctiiden *Comacla senex* Hb. Denne arten var tidligere ikke kjent fra noen norsk lokalitet. Eksemplaret ble tatt i omegnen av garden Dale (ca. 350 m. o. h.), trolig i august 1960 (nøyaktig fangstdato ikke angitt). Dyret var noe defekt, men de særlige kjennetegnene for arten trådte likevel tydelig fram.

Etter at dette funnet var meddelt, fant ing. Opheim i Zoologisk Museums samlinger ytterligere ett norsk eksemplar av *Comacla senex*, feilaktig bestemt som *Nudaria mundana* L. Dette eksemplaret var blitt tatt av H. Henrichsen på Ås-myrene (Ak) 26. juni 1906. I en hektografert oversikt over Lepidoptera fra Ås (1911) oppgir Henrichsen om *N. mundana* «Flere ex. i juni og juli omsværmende myrplanter.» Wahlgren oppgir likeledes i «Svenska Fjärilar» som lokalitet for *C. senex* myrmarker og fuktige enger, der larvens næringsplante *Jungermannia* (levermose) vokser.

Comacla senex er utbredt over det meste av Europa og Vest-Asia, men regnes for forholdsvis sjelden. I Norden finnes den tallrikt i Danmark, Sør-Sverige og Sør-Finland, langs Bottenvika helt opp til 66° nord. Artens tette utbredelse og relativt vanlige forekomst i våre naboland skulle tyde på at den også kan finnes utbredt hos oss. Funnet ved Byglandsfjord indikerer en sammenhengende utbredelse i de sørlige delene av Norge, for en isolert forekomst så langt vest er neppe sannsynlig. *C. senex* er såpass lite iøyenfallende at den trolig for det meste er blitt oversett eller feilbestemt av samlere, det er derfor all grunn til å anta at den med tida vil vise seg å forekomme flere steder her i landet.

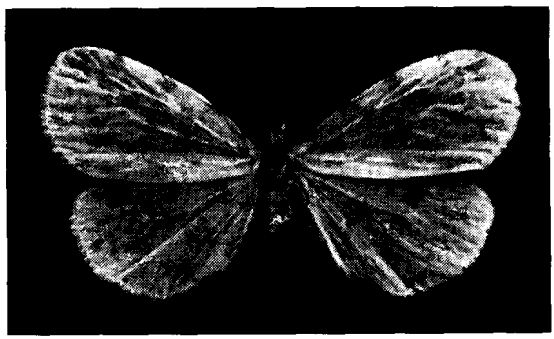


Fig. 1. *Comacla sencx* Hb. Ekspl. fra Danmark. 3,5 x.

Summary

A single specimen of the arctiid moth *Comacla senex Hb.* was identified in a sample of Lepidoptera sent to the author from Dale, Byglandsfjord in southern Norway (AAi). The material had been collected during the autumn (August-September) of 1960. This species was not previously known from the Norwegian fauna.

A later investigation of the collections in the Zoological Museum, University of Oslo, has revealed another Norwegian specimen of the moth, labeled Ås (Ak), June 26th, 1906. The specimen had been erroneously classified as the closely related species *Nudaria mundana* L.

Norsk Entomologisk Forening

Årsmelding 19. februar 1962 — 18. februar 1963

Medlemstall. I meldingsåret har foreningen fått 19 nye medlemmer: stud. real. Erik Arnkværn, Oslo, vit. ass. Øystein Austarå, Vollebekk, cand. mag. Hans Jan Bjerkely, Oslo, cand. mag. Einar Brun, Oslo, stud. Jens Evang, Oslo, cand. real. Kristian Fauchald, Espegrend, gymnasiast Arne Fjellberg, Tjøme, vit. ass. Lita Greve, Bergen, cand. mag. Gisle Grimeland, Nesbru, cand. mag. Per Knudsen, Blindern, cand. mag. Tore Lauvstad, Oslo, cand. mag. Albert Lillehammer, Blindern, stud. real Peter Nicolay Ræder, Oslo, cand. mag. Jon-Arne Sneli, Blindern, cand. mag. Eyvind N. Søfteland, Bergen, amanuensis Nils-Jarle Ytreberg, Blindern, cand. real. Eyvind Østbye, Blindern, Det norske skogforsøksvesen, Vollebekk, Zoologisk Institutt, Århus Universitet, Danmark.

Foreningen har nå 140 medlemmer. Medlemmene fordeler seg slik: 87 norske, personlige medlemmer, 8 norske institusjoner, 39 utenlandske, personlige medlemmer hvorav 5 er korresponderende, og 6 utenlandske institusjoner.

Styret. I meldingsåret har foreningen hatt følgende styre og tjenestemenn: Formann: forsøksleder Alf Bakke, viseformann: konservator Astrid Løken, sekretær: forsøksassistent Gudmund Taksdal, styremedlem: lærer Per F. Waaler, varamenn: kontorsjef Andreas Strand og stud. real. Reidar Mehl, redaktør: førstekonservator Nils Knaben, medlemmer av redaksjonskomiteen: professor dr. A. Semb Johansson og forsøksleder Alf Bakke, distributør: statsentomolog Jac. Fjelddalen, kasserer: disponent C. F. Lühr, revisor: brukseier Eivind Sundt.

Tidsskriftet. Hefte 1—2, bind XII, av Norsk Entomologisk Tidsskrift kom ut i november 1962.

Ekskursjoner. Det ble arrangert ekskursjon til Ås 17/6.

Møter. I vårsemesteret ble det holdt 2 møter og i høstsemesteret 3 møter. Styret har hatt 2 sammenkomster.

Årsmøte 19. februar 1962.

Dr. Ragnhild Sundby holdt foredrag om «Nyere biologiske undersøkelser i entomologien». Foredraget er trykt i «Fauna» årg. 15, hefte 3, 1962.

Lektor Per Hafslund viste en rekke glimrende lysbilder. Vi fikk først se en serie av jordvepsbol, og hvorledes egg, larver og pupper er plassert i cellene i kaken. I en annen serie fulgte vi oppbygningen av et vanlig vepsebol fra dronningen begynner sitt arbeid om våren, til bolet ga plass for en hel koloni med alle forskjellige utviklingsstadier. Bildene var usedvanlige klare og instruktive, og lektor Hafslunds kommentarer inneholdt en mengde morsomme opplysninger. Videre ble det vist en rekke næropptak av småfugl og gnagere, og til slutt en serie om marine dyr.

Lektor Hafslund er interessert i materiale som er spesielt aktuelt til undervisningsbruk, og henstilte til medlemmene i NEF å hjelpe til med å skaffe brukbare fotoobjekter.

På *årsmøtet* var det ingen bemerkninger til sekretærens årsmelding for tiden 18. februar 1961 til 19. februar 1962. Det reviderte regnskapet forelå stensilert, og ble godkjent.

Resultatet av valg på tillitsmenn ble følgende: Formann: Alf Bakke (24 st.), viseformann: Astrid Løken (24 st.), sekretær: Gudmund Taksdal (24 st.), varamann: Andreas Strand (16 st.), redaktør: Nils Knaben (25 st.), medlem av red.komite: Arne Semb Johansson (25 st.). revisor: Eivind Sundt (25 st.), ny varamann etter G. Taksdal: Reidar Mehl.

Dr. L. R. Natvig gjorde oppmerksom på at han vil trekke seg tilbake som distributør for NET, og at Zoologisk Museum p. g. a. plassmangel ikke lenger kan oppbevare lageret av gamle tidsskrifter. Blant de tilstedeværende var det enighet om at NEF fortsatt selv bør stå for distribuering av tidsskriftet. Styret fikk fullmakt til å undersøke mulighetene for å finne en ny distributør. Statsentomolog Fjelddalen har på styrets forespørsel sagt seg villig til å stå som distributør for tidsskriftet.

Det var 21 medlemmer til stede på møtet.

Møte på Zoologisk Museum 4. april 1962.

Cand. mag. Birger Herstad fortalte om farge- og væske-fellefangst av insekter.

Sommeren 1961 ble det til fangst av insekter på bygg, anvendt fargefeller. Fellene som ble benyttet, bestod av runde blikkar, diameter 20 cm og høyde ca. 10 cm. Det ble oppsatt 4 feller som hver var malt innvendig og utvendig med en farge, gul, blå, rød og grønn. Fellene stod i firkant, ca. 1/2 m mellom hver felle, i samme høyde og i nivå med toppen av vegetasjonen. Fellene ble fyllt opp halvt med vann, og et par dråper Zalo vaskemiddel ble tilsatt vannet for å bryte overflatehinnen. Fellene ble tømt hver 3. til 4. dag.

I løpet av 2 mndr. ble det tatt knapt 40 000 insekter. Vel halvparten var Diptera, ca. 14 000 Thysanoptera. Resten var fordelt på Coleoptera, Hymenoptera, noen Lepidoptera og en del Hemiptera, vesentlig Aphididae.

Det største antall insekter ble tatt i den gule og den blå fellen (Autorref.).

Til slutt viste stud. real. Reidar Mehl en serie gode og interessante lysbilder fra en tur på Svalbard.

På møtet var 17 medlemmer til stede.

Møte på Zoologisk Museum 12. september 1962.

Forsøksleder Alf Bakke, disponent C. F. Lühr, konservator Astrid Løken, ing. Magne Opheim og dosent Ragnhild Sundby fortalte fra det 12. nordiske entomologmøtet i København i sommer.

I diskusjonen om sommerens fangst ble det nevnt at 1962 nok hadde vært en dårlig sommersesong. Likevel ble det rapportert om funn av nye arter for landet innenfor forskjellige insektgrupper.

Strand sa at for hans vedkommende var sommerens utbytte på grunn av det elendige været blitt meget dårlig. Ved hoving i Oslo hadde han likevel tatt et eksemplar av *Longitarsus ochroleucus* Marsh. og på AK: Hovedøya, på *Berteroa incana*, et eksemplar av *Ceuthorrhynchus hampei* Bris., begge nye for landet.

Når det gjelder samlemåter mente han at de norske koleopterologene altfor ensidig hadde holdt seg til sikten, og at bl. a. en systematisk under-

søkelse av forskjellige planter vil kunne gi nye funn. Klekning, som i våre naboland har gitt så mange interessante ting, er praktisk talt ikke blitt gjort hos oss.

Han gjorde oppmerksom på Georg Kerstens' artikkel «Coleopterologisches vom Lichtfang» i Ent. Bl., 57, s. 119, og flg. som viser at lysfangst også for koleopterologene kan gi utmerket resultat, og refererte dr. Claude Besuchets ualminnelig interessante arbeid «Biologie, morphologie et systématique des *Rhipidius*». i Mitt. Schweiz. Ent. Ges., XXIX, s. 73 og flg., samt viste fram en ♂ og en ♀ av *Rhipidius quadriceps* Ab. (Autorref.).

Ing. Opheim viste fram to nye sommerfuglarter for landet, *Aphomia gularis* Z., som var funnet på Oslo Havnelager, og *Gelechia muscosella*, Z. som var klekt av forskningsassistent Edland av larve funnet på *Salix* sp.

Ellers deltok Knaben, Bakke, Løken, Lühr, Seglen, Mehl, Andersen og Bang i samtalen om sommerens fangst.

På møtet var 18 medlemmer til stede.

Møte på Zoologisk Museum 24. oktober 1962.

Program på møtet var auksjon over buntmaker Fritz Jensens entomologiske boksamling. Det var stor interesse for mange av bøkene og samlingen ble solgt for i alt *kr. 3 619,20.* Flere medlemmer mente NEF burde få noen prosenter av denne summen for arbeidet med å arrangere auksjonen. — Etter senere avtale med Fritz Jensen jr. tilfaller 15% NEF.

På møtet var 20 medlemmer til stede.

Møte på Zoologisk Museum 5. desember 1962.

I et kåseri om sammenhengen mellom billefaunaen i Fennoskandia og på de britiske øyer gjorde Strand oppmerksom på en rekke arter med en eiendommelig utbredelse: 1. Arter som er mer eller mindre utbredt over de britiske øyer og som i Fennoskandia er begrenset til V.-Norge, som f. eks. *Trechus fulvus* Dej., *Aëpus marinus* Strøm, *Bembidion harpaloides* Serv., *Bembidion tibiale* Dft., *Corymbites cupreus* F., *Phytodecta intermedius* Hellies (de to siste er kommet til Finland og N.-Sverige fra øst), *Chrysomela crassicornis* Hellies, *Mesites tardyi* Curt., men som mangler i Danmark og delvis i N.-Tyskland. 2. Arter med en nordlig utbredelse som i Fennoskandia vesentlig finnes i nordlige strøk og delvis i de sentrale fjelltrakter, og som også på de britiske øyer for det meste har en nordlig utbredelse (en del er bare funnet på en enkelt lokalitet) som bl. a. *Nebria nivalis* Payk., *Pelophila borealis* Payk., *Elaphrus lapponicus* Gyll., *Amara alpina* Payk., *Pterostichus adstritus* Eschz., *Agonum sahlbergi* Chaud. og *Philonthus scoticus* Joy. En art, nemlig *Eudectus whitei* Sharp., som er beskrevet etter et eksemplar tatt på en fjelltopp i 3900 fots høyde i N.-Skottland, og senere funnet i N.-England, er for øvrig ikke sikkert påvist andre steder vestenfor Kaninhalvøya.

Strand gjorde videre oppmerksom på følgende nylig publiserte, meget interessante arbeider, som gir et høyst overraskende bilde av billefaunaen i M.-England for respektive ca. 57 000, 42 000 og 38 000 år siden:

1. G. R. Coope, 1959: A Late Pleistocene insect fauna from Chelford, Cheshire. — Proc. Roy. Soc., B, 151, 70—86.
2. G. R. Coope, F. W. Shotton, I. Strachan, 1961: A Late Pleistocene flora and fauna from Upton Warren, Worcestershire. — Phil. Trans. Roy. Soc., B, 244, 379—421.
3. G. R. Coope, 1962: A Pleistocene coleopterous fauna with arctic affinities from Fladbury, Worcestershire. — Quart. Journ. Geol. Soc. London, 118, 103—123.

Påfallende er det forholdsvis store antall arter med nordlig eller endog arktisk utbredelse, deriblant en rekke arter som nå ikke finnes på de britiske øyer.

Coope slutter sitt siste arbeid med å si at under slutten av siste interglacial eller under tidligere mellomstadier av siste istid synes den skandinaviske og den britiske billefauna å ha vært påfallende like, og sammenhengen mellom faunaen i de to områdene var da ennå mer fremtredende enn den er i dag. Forekomsten av nordlige, ikke flygedyktige arter peker i retning av at det i dette tidsrommet var landforbindelse mellom de britiske øyer og Skandinavia, hvor disse jordbundne billene fritt kunne vandre. (Autorref.).

Etter kåseriet viste stud. real. Reidar Mehl en serie interessante lysbilder fra en reise i Nord-Norge.

Det var 26 medlemmer til stede på møtet.

G. T.

Junioravdelingen.

Junioravdelingen har i meldingsåret hatt 8 møtedager og 1 ekskursjon. Programmet har omfattet demonstrasjoner av innsamlet materiale, samtaler, kåserier av seniormedlemmer og gjennomgåing av preparering av insekter, genitalier m. v.

Etter sommerferien gikk de eldste juniorer etter avlagt eksamen artium over i hovedforeningen. I den anledning ble det sendt rundt orientering til Oslo folkeskoler om tegning av nye, interesserte medlemmer. På første møte meldte det seg 9 nye, betalende juniorer. Noen av disse hadde alt arbeidet litt med insektinnsamling.

Som tidligere år vil jeg særlig få takke konservator Nils Knaben og ingeniør Magne Opheim for aldri sviktende interesse og støtte for dette juniorarbeidet. De har begge to deltatt i nesten hvert eneste møte i avdelingen.

Olav Kvalheim.

INNHOLD

Date of distribution:

Desember 12. 1963

Bergen 1963. A.s John Griegs Boktrykkeri