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NORSK ENTOMOLOGISK FORENING

ser sin hovedoppgave i å fremme det entomologiske studium i Norge, og danne et bindeledd mellom de interesserte. Søknad om opptagelse i foreningen sendes formannen. Medlemskontingenten er for tiden kr. 20,— pr. år. Medlemmer får tidsskriftet fritt tilsendt.

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Six Species of Spiders (Araneae) New to Norway

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Hauge, E. 1969. Six species of spiders (Araneae) new to Norway. *Norsk ent. Tidsskr. 16,* 1—8.

Six species of spiders of the families Hahniidae, Theridiidae, Linyphiidae and Erigonidae have been found in Ankenes, Nordland in Northern Norway during the summers of 1966-68, all reported for the first time in Norway. The species are: *Hahnia mengei* Kulcz., *Robertus lyrifer* Holm, *Macrargus multesimus* (Cambr.), *Lepthyphantes exiguus* Holm, *Gongylidium nigriceps* Kulcz., and *Microcentria pusilla* (Schenkel).

In my collection of spiders found in Northern Norway during the summers of 1966-68, there are some species which must be considered as new to Norway. The following families are represented: Hahniidae (1 species), Theridiidae (1 species), Linyphiidae and Erigonidae (4 species). All species have been found in Nordland, Skjomenfjord in Ankenes community ('herred'), about 30 km south of Narvik, in the ground cover of birch forest.

The specimens are kept at the Zoological Museum, Bergen.

The relatively large collections of most of the species here described, make it possible to calculate the mean values and their standard deviations, in order to give an idea of the size of the individuals of a northern population of the species. It is in fact my opinion that information about the total length of spiders has mainly the value of indicating the size of the animals, and is less useful for statistical treatment. This is especially true of the females, mainly because of the great diversity due to the presence or absence of eggs in the abdomen, but also because of the bending of the pedicel making different angles between the thoracic and abdominal region. Much better measurements for this purpose may be of the length and width of the carapace. My assertion is most clearly illustrated in comparing the mean values and standard deviations given for the total length and abdomen versus the same values for the length and width of the carapace given for the females of *Robertus lyrifer,* also comparing these values for the total length and abdomen of the females versus the same measurements for the males of *R. lyrifer.*

Hahnia mengei Kulcz.

Altogether the collection consists of 131 ♀♀ and 58 ♂♂, both sexes collected from May to September, in moss and dead leaves in birch forest 100-400 m above sea level. This species seems to have a preference for moss in light localities with *Vaccinium myrtillus, V. vitis-idae* and *Empetrum sp.* as the dominating plants. 123 adult specimens out of 240 samples were caught on such localities, while only 14 specimens out of 267 samples have been taken in more shady nearby localities with undergrowth dominated by small ferns *(Dryopteris* sp.).

Measurements of body in mm (mean values and standard deviations based on 15 specimens of each sex): ♀: Total length 2.17 ± 0.15, length of abdomen 1.28 ± 0.12, length and width of carapace 0.90 ± 0.04 and 0.71 ± 0.04. ♂: Total length 1.92 ± 0.12, length of abdomen 1.15 ± 0.09, length and width of carapace 0.83 ± 0.03 and 0.68 ± 0.05.

Carapace yellow-brown, heavily suffused with black, striae more chocolate-coloured, general impression of carapace is very dark. Sternum yellow-brown with dark margin, and with long, black hairs. Legs a little lighter than carapace, coxae very light. Abdomen greyish-black with trace of light dorsal transverse lines, hairy, partly with light hairs.

Both rows of eyes strongly procurve. Clypeus approximately equal to the diameter of the anterior lateral eyes.

The epigyne (see Dahl 1937, Fig. 10) has very indistinct details, which make the identification of the species uncertain, and may lead to confusion with *H. nava* (Locket & Millidge 1953, Fig. 22), but the vulva (Fig. 1) leaves no doubt about the species (compare with Dahl 1937, Fig. 20).

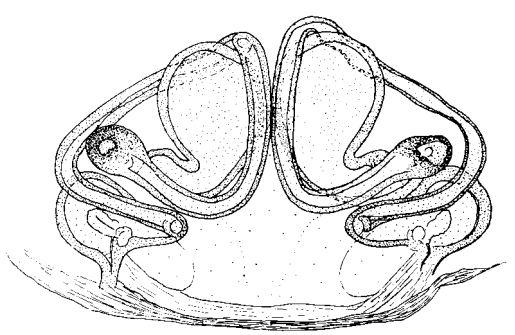

Fig. 1. *Hahnia mengei* ♀, vulva.

Fig. 2. *Hahnia mengei* ♂, palpal tibia and patella.

On Fig. 2 one recognizes the little tooth (to.) on the hook of the male palpal patella.

Distribution in Sweden: Blekinge and Torne Lappmark (Holm 1950). Finland: Lapland (Palmgren 1965), Hyytiälä (Huhta 1965). General distribution: Europe (Dahl 1937).

Robertus lyrifer Holm, 1939

Seventy-seven ♀♀ and 16 ♂♂. The females collected from June to September 1967, and from June to August 1968. Earliest finding of ♂♂ 9 July 1967. Found only in moss in light birch forest with *Vaccinium myrtillus, V. vitis-idae* and *Empetrum* sp. as dominating plants, 150-350 m above sea level.

Some measurements of body. Mean values in mm based on 15 ♀♀ and 9 ♂♂, compared with the same values (in brackets) given by Holm for the holotype ♀ (1939) and the allotype ♂ (1945): ♀: Total length 3.41 ± 0.46 (3.2 mm), length of abdomen 1.81 ± 0.42 (1.8 mm), length of carapace 1.56 ± 0.05 (1.5 mm), width of carapace 1.10 ± 0.04 (1.1 mm). ♂: Total length 2.59 ± 0.11 (2.5 mm), length of

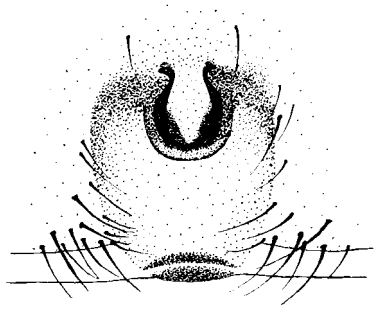

Fig. 3. *Robertus lyrifer* ♀, epigyne.

abdomen 1.41 ± 0.12 (?), length of carapace 1.23 ± 0.07 (1.32 mm), width of carapace 0.95 ± 0.03 (1.0 mm).

Length of legs from 1 ♀ (ta.-metat.-tib.-pat.-fem.): I(0.56-0.74-0.84-0.49-1.16) = 3.79 mm, II (0.49-0.60-0.74-0.42-0.95) = 3.20 mm, III (0.49-0.53-0.60-0.39-0.79) = 2.80 mm, IV (0.60-0.74-0.95-0.45-1.12) = 3.86 mm.

The epigyne (Fig. 3) has a characteristic lyre-shaped figure.

Clear details of the vulva have not yet been published, probably because the details are somewhat obscure. On Fig. 4 I have therefore tried to indicate the vulva, and on Fig. 5 the palpe of the male.

Distribution in Sweden: Lapland. Finland: Lapland (Palmgren 1965).

Macrargus multesimus (Cambr.)

In moss and dead leaves on the ground in birch forest, 150-300 m above sea level: 1 ♀

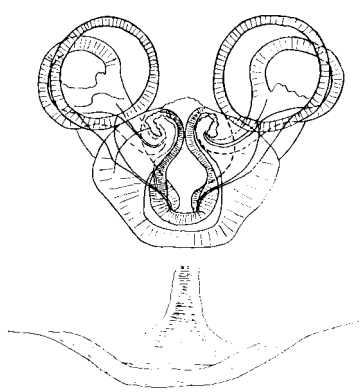

Fig. 4. *Robertus lyrifer* ♀, vulva.

Fig. 5. *Robertus lyrifer* ♂, right palpe from outside.

25 July 1966, 1 ♀ 9 August 1966, 1 ♀ 16 May 1967, 3 ♀♀ 28 July 1967, 1 ♀ + 1 ♂ 19 August 1968.

Some measurements from females and the male are put together in Table I, and compared with *M. rufus* and *M. r. carpenteri*, also found in the same area, and also compared to *M. boreus* (Holm 1968).

Colours: Carapace brownish-red, very slightly traced black dorsal hexagonal spot and do. striae, legs as carapace. Abdomen greyish-black.

Eyes: Posterior row straight, all eyes of equal size and equidistant (i.e., about 1.25 + their diameter). Anterior row recurve. Laterals about 1.5 × the diameter of the posteriors, and the medians about 0.75 × that diameter.

Sternum as long as it is broad.

Chelicerae: ♀: Strong, 5 large teeth on the anterior margin, equidistant and of equal size, except for the innermost, which is somewhat

Table I. Measurements from *Macrargus multesimus* compared with the corresponding measurements from *M. rufus*, *M.r. carpenteri* and *M. boreus*

	Macrargus multesimus		*M. rufus*		*M.r. carpenteri*	*M. boreus*
	6♀♀	♂	6♀♀	4♂♂	1 ♂	1 ♂
	mean and range		mean, range	mean, range		
Total length in mm	2.93	3.2	3.98	3.81	2.84	2.95
	2.73-3.22		3.50-4.63	3.50-4.15		
Length of carapace	1.24	1.44	1.64	1.77	1.23	1.28
	1.17-1.30		1.51-1.75	1.68-1.87		
Width of carapace	0.90	1.02	1.22	1.29	0.98	0.96
	0.84-0.96		1.16-1.35	1.19-1.36		
Abdomen,	1.85	1.75	2.34	1.97	1.96	?
length in mm	1.82-2.05		2.10-2.49	1.58-2.38		
Length of legs in mm:						
I	3.94	4.49	5.26	5.79	4.92	4.16
	3.65-4.25		4.85-5.51	5.56-6.08		
II	3.61	4.21	4.83	5.32	4.51	3.81
	3.35-3.87		4.49-5.04	5.16-5.58		
III	3.18	3.51	4.12	4.42	3.87	3.22
	2.96-3.38		3.76-4.25	4.11-4.67		
IV	4.24	4.82	5.40	5.53	5.02	4.20
	3.94-4.57		4.87-5.60	5.10-6.15		
Positions of trichobothriums on						
metat: I	0.53	0.58	0.47	0.44	0.43	?
	0.50-0.54		0.43-0.49	0.39-0.49		
II	0.52	0.58	0.45	0.42	0.40	0.47
	0.50-0.55		0.41-0.48	0.41-0.45		
III	0.48	0.52	0.40	0.38	0.38	0.5
	0.47-0.50		0.36-0.46	0.36-0.39		
IV	0.51	0.51	–	–	–	0.48
	0.48-0.56					

smaller than the others. Posterior margin with 6 smaller, but still strong and equidistant teeth. ♂: Strong, with a tubercle at the front. Posterior margin with 5 large teeth, the innermost and the outermost somewhat larger than the others. Anterior margin has 5 much smaller teeth, apart from No. 2, which has the same size as the teeth on the posterior margin. The fang is swollen near its base.

The epigyne (Fig. 6a, b) shows some basic similarities to that of both *M. rufus* and *M. r. carpenteri*, but the basal part is somewhat longer and more tube-like on *multesimus* (Fig. 6b).

The vulva of *multesimus* (Fig. 7) also has much in common with the vulva of *rufus* and *r. carpenteri* (see Wiehle 1956).

On the male palpe (Fig. 8) one recognizes the characteristic paracymbium from a drawing made by Kaston (1948), but unfortunately the very conspicuous, rounded and somewhat transparent lamella characteristica is lacking in Kaston's drawing. Fig. 9 shows the same palpe ventrally.

Distribution in Sweden: Torne Lappmark, Västerbotten (Holm 1950). (Holm here reports it from Norway, but without locality specification.) Finland: Lapland (Palmgren 1965). General distribution: Siberia, North America (Holm 1950).

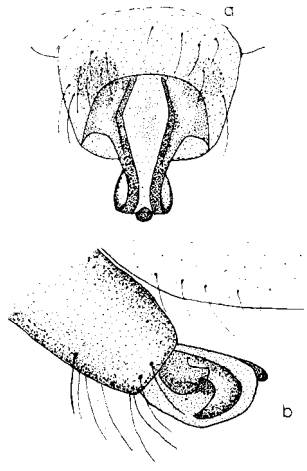

Fig. 6. *Macrargus multesimus* ♀, a. epigune, b. epigyne from side.

Lepthyphantes exiguus Holm, 1939

One ♀ 21 July 66, 37 ♀♀ collected from June to September 1967, 1 ♂ 10 June 67, 2 ♂♂ 8 August 67, 3 ♂♂ 4-9 September 67, 31 ♀♀ from June to August 1968, 1 ♂ 1 August 68. In moss and among dead leaves in birch forest 150-250 m above sea level.

Some measurements of body in mm (mean values based on 6 ♂♂ and 16 ♀♀, and with Holm's (1939) value for the holotype (♂) and an allotype (♀) in brackets): ♂: Total length 1.51±0.11 (1.56 mm), abdomen 0.86±0.09 (1.1 mm), length of carapace 0.68±0.03 (0.72 mm), width of carapace 0.57±0.02 (0.6 mm). ♀: Total length 1.63±0.09 (1.7 mm), abdomen 0.98±0.07 (1.2 mm), length of carapace 0.69±0.03 (0.74 mm), width of carapace 0.56±0.02 (0.6).

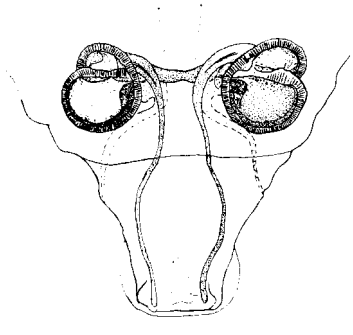

Fig. 7. *Macrargus multesimus* ♀, vulva.

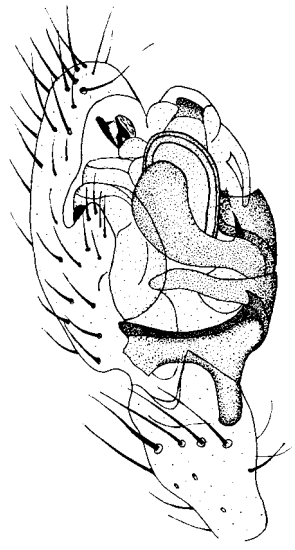

Fig. 8. *Macrargus multesimus* ♂, right palpe from outside.

Length of legs: 1 ♀: I(0.49-0.61-0.70-0.23-0.74) = 2.77 mm, II (0.46-0.56-0.63-0.21-0.70) = 2.56 mm, III (0.39-0.51-0.47-0.21-0.60) = 2.18 mm,

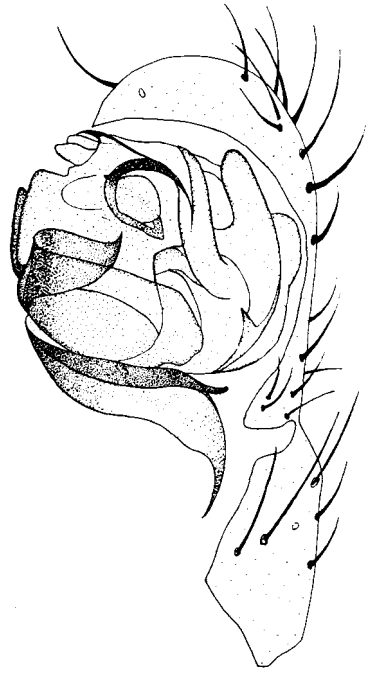

Fig. 9. *Macrargus multesimus*, right palpe, ventral view.

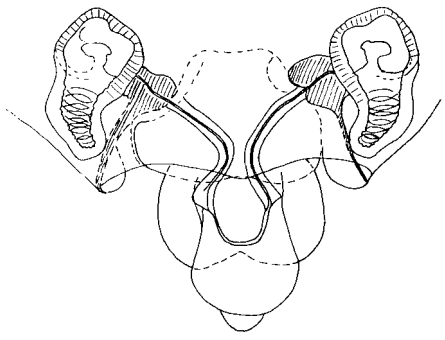

Fig. 10. *Lepthyphantes exiguus* ♀, vulva.

IV (0.49-0.67-0.74-0.21-0.70) = 2.81 mm. Tm I = 0.20, Tm II = 0.22, Tm III = 0.21, no Tm IV. 1 ♂: I (0.49-0.65-0.70-0.21-0.74) = 2.79 mm, II (0.51-0.60-0.63-0.21-0.68) = 2.63 mm, III (0.39-0.51-0.51-0.18-0.61) = 2.20 mm, IV (0.53-0.72-0.75-0.21-0.81) = 3.02 mm. Tm I = 0.22, Tm II = 0.21, Tm III = 0.16, no Tm IV.

The vulva (Fig. 10) has not previously been published. The male palpe (Fig. 11) has a lamella characteristica with a very conspicuous divided distal end.

Fig. 11. *Lepthyphantes exiguus* ♂, right palpe.

Distribution in Sweden: Lapland, Västerbotten, Jämtland (Holm 1950). Finland: Lapland (Palmgren 1965, Huhta 1965).

Gongylidium nigriceps Kulcz.

One ♀ 8 August 1966, 1 ♀ 11 May 1967, 1 ♀ 12 August 1967, 1 ♀ 21 June 1968, 1 ♀ 24 June 1968. In moss and dead leaves in birch forest 10-200 m above sea level. One ♀ on a lawn about 20 m above sea level.

Measurements of body, mean values based on all 5 specimens: Total length 4.06 mm (3.58-4.43 mm), abdomen 2.33 mm (1.96-2.71 mm), length and width of carapace 1.65 mm (1.59-1.68 mm) and 1.23 mm (1.19-1.24 mm). Tm I (mean value) = 0.72 (range 0.69-0.74).

General description, see Tullgren (1955). For vulva see Fig. 12. Tullgren (1955) mentions that he has identified his Swedish specimens after Kulczynski (1916), though with some uncertainty. Comparing my specimens with Tullgren's description it is evident that Tullgren and I must have got the same species.

Distribution in Sweden: Uppland. General distribution: Siberia (Roewer 1942).

Microcentria pusilla (Schenkel)

Males and females collected from June to September 1967, from June to August 1968. This species is very abundant in moss in light birch forest (same localities as mentioned for *Robertus lyrifer*).

Measurements of body (mean values in mm based on 10 ♂♂ and 10 ♀♀): ♀: Total length 1.38 ± 0.08, length of abdomen 0.67 ± 0.06, length and width of carapace 0.68 ± 0.03 and 0.50 ± 0.02. ♀: Total length 1.41 ± 0.06, abdomen 0.74 ± 0.05, length and width of carapace 0.66 ± 0.02 and 0.46 ± 0.02.

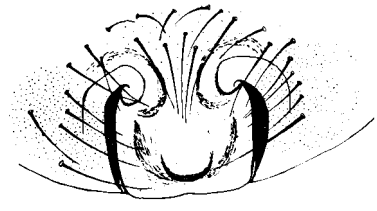

Fig. 12. *Gongylidium nigriceps* ♀, epigyne.

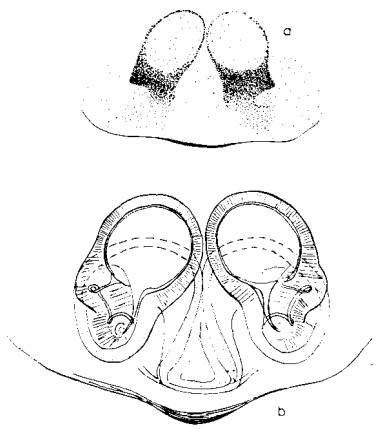

Fig. 13. *Microcentria pusilla* ♀, a. epigyne, b. vulva.

Tm I = 0.41 (range 0.39-0.44), 20 specimens, no significant difference between the sexes.

Because of the sparse knowledge of the distribution of this species in Scandinavia, I have decided to give figures of the epigyne (Fig. 13a), the vulva (Fig. 13b) and the male palpe (Fig. 14). For further description see Wiehle (1960). The elliptical arrangement of the two rows of eyes (Wiehle 1960, Fig. 1017) is very conspicuous, and may be useful, together with the position of Tm I, to distinguish the females of *M. pusilla* from the females of *Diplocentria bidentata* (Em.). The corkscrew-formed embolus of the male palpe is very distinct.

Distribution: Schweiz (Wiehle 1960), recently reported as common in Finnish Lapland and 1 ♀ from Hyytiälä in Southern Finland (Huhta 1965), Mt. Mansfield, Vt., Canada. In Sweden: Lule Lappmark, Lycksele Lappmark, Västerbotten and Jämtland (Holm 1945).

For synonyms see Holm (1945). Holm here claims that this species should have the name *M. rectangulata*, after Emerton (1915).

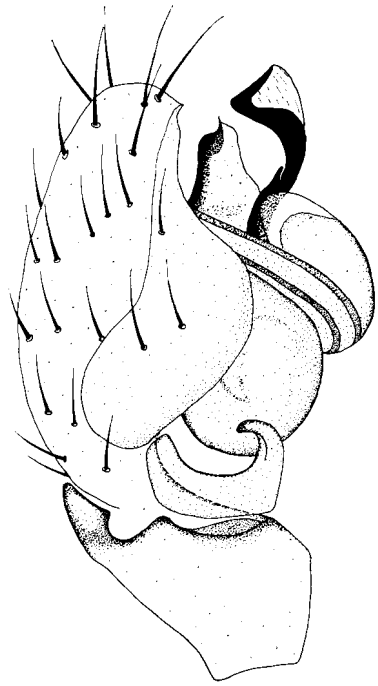

Fig. 14. *Microcentria pusilla* ♂, right palpe.

REFERENCES

Dahl, M. 1937. Spinnentiere oder Arachnoidea. 19. Familie: Hahniidae. *Tierwelt Dtl., Teil 33,* 100-114.

Emerton. 1915. *Conn. Ac. Sci. Trans. Philad. 20,* 137.

Holm, Å. 1939. Neue Spinnen aus Schweden. *Ark. Zool. 31a* (8), 1-38.

Holm, Å. 1945. Zur Kenntnis der Spinnenfauna des Torneträskgebietes. *Ark. Zool. 36a* (15), 1-80.

Holm, Å. 1950. Studien über die Spinnenfauna des Torneträskgebietes. *Zool. Bidr. Uppsala 29,* 103-213.

Holm, Å. 1968. A contribution to the spider fauna of Sweden. *Zool. Bidr. Uppsala 37* (2). 183-209.

Huhta, V. 1965. Ecology of spiders in the soil and litter of Finnish forests. *Ann. Zool. Fenn. 2,* 260-308.

Kaston, B. J. 1948. Spiders of Connecticut. *State Geological and Natural Survey Bull.* No. 70. Hartford. 874 pp.

Kulczynski, Vl. 1916. Araneae sibiriae occidentalis arcticae. *Zap. imp. Akad. Nauk., VIII^e series, 38* (11), p. 8.

Locket, G. H. & Millidge, A. F. 1953. *British Spiders II.* Ray Society, London. 449 pp.

Palmgren, P. 1965. Die Spinnenfauna der Gegend von Kilpisjärvi in Lappland. *Acta Zool. Fenn. 110,* 1-70.

Roewer, C. Fr. 1942. *Katalog der Araneae 1.* Bremen. 1040 pp.

Tullgren, A. 1955. Zur Kenntnis schwedischer Erigoniden. *Ark. Zool. 7,* 295-389.

Wiehle, H. 1956. Spinnentiere oder Arachnoidea (Araneae). 28. Familie Linyphiidae-Baldachinspinnen, *Tierwelt Dtl., Teil 44,* 337 pp.

Wiehle, H. 1960. Spinnentiere oder Arachnoiden (Araneae), XI: Micryphantiden-Zwergspinnen, *Tierwelt Dtl., Teil 47,* 620 pp.

Received 30 December 1968

Geophilus insculptus Attems 1895 and *Geophilus proximus* C. L. Koch 1847 (Chilopoda) in Norway

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Meidell, B. A. 1969. *Geophilus insculptus* Attems 1895 and *Geophilus proximus* C. L. Koch 1847 (Chilopoda) in Norway. *Norsk ent. Tidsskr. 16*, 9-12.

Geophilus insculptus Attems 1895 is reported for the first time in Norway. Twelve specimens were collected in 1967-68 in Hordaland and Bergen on the west coast of Norway. Some new localities, mainly from the west coast, are given for *G. proximus* C. L. Koch 1847.

Geophilus insculptus Attems 1895 has been much confused with *Geophilus proximus* C.L. Koch 1847. Both belong to the subgenus *Bothrogeophilus* characterized by a 'carpophagus' structure, named after the species in which it was first described, *Geophilus carpophagus* Leach 1814. This carpophagus structure consists of a transverse pit or fossa on the anterior margin and a corresponding peg in the middle of the posterior border of the preceding sternite. In *G. insculptus* and *G. proximus*, these carpophagus structures are very similar in appearance. The carpophagus fossa is transversely triangular or sickle-shaped when viewed ventrally, and occupies about nine-tenths of the width of the sternite when fully developed.

GEOPHILUS INSCULPTUS ATTEMS 1895

The maxillae of *G. insculptus* are shown in Fig. 1a. Apical claw of second maxillary telopodite is replaced by a small peg (Fig. 1b). The pore-area on the sternite is spindle-shaped. The clypeal area is missing. The labrum has a mid-piece with seven well-formed teeth. For a more detailed description see Eason (1964).

Four ♀♀, 5 ♂♂, and 3 juv. of *G. insculptus* have been found in Hordaland and Bergen in western Norway. The finds are: Varaldsöy, Knarrevikheiane 6 June 1967, 3 ♀♀ + 1 ♂ + 1 juv. Fana, Fjösanger 8 September 1967, 1 ♂ (leg. G. Litland). Bergen, Nygårdshöyden 28 April 1968, 1 ♀ + 3 ♂♂ and 14 June 1968, 2 juv. The locality at Varaldsöy is a slope facing southeast. The animals were found on semi-cultivated land. The specimens from Nygårds-

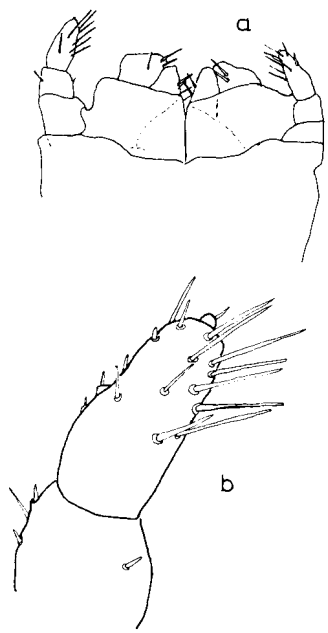

Fig. 1. *Geophilus insculptus*. a. Maxillae, b. tarsus of 2nd maxillary telopodite, showing the modified apical claw.

höyden (Bergen) were found in an old garden, 15 cm deep in sandy soil.

Some measurements of adult specimens are presented in Table I.

The present specimens differ from the general description (Eason 1964) in the following ways: the apical claw on the last pair of legs is much more distinct in the female than the male. The carpophagus peg at the posterior extremity of the sternite is surrounded by a heavily chitinized depression, and on each side of this depression, in the poststernal areas (Eason 1964, Fig. 153) is another not so clearly pronounced depression. The labrum in one specimen had one prolonged and six normally formed teeth.

Table I. Measurements of *Geophilus insculptus* in mm

Sex	n	Length	Width	No. of pairs of legs
♀♀	4	25–34	0.8–1.0	49 or 51
♂♂	5	24–33	0.8–1.0	49

G. insculptus is reported from the following countries: Austria, Hungary, Romania, Northern Italy, and Sardinia (Attems 1929, p. 356); France (Brolemann 1930); Southern Germany (Verhoeff 1934); Southern Sweden (Lohmander 1954); England, Wales, Scotland, and Ireland (Eason 1964).

Lohmander (1956) states that *G. insculptus* has a synantropic distribution in Sweden. Only a few, very sporadic finds from Skåne, western Småland and southern Värmland are reported. In Norway also, *G. insculptus* has a synantropic distribution.

GEOPHILUS PROXIMUS C.L. KOCH 1847

G. proximus has an ordinary apical claw on the second maxillary telopodite. Pore-area on the sternite is diamond-shaped. The clypeal area is distinct. The mid-piece of the labrum has one tooth (Brolemann 1930, Fig. 241).

G. proximus has been reported from Norway by Porat (1887), Ellingsen (1891, 1896, 1903, 1910), and Storm (1898). Fifty localities have been noted, but only four from the west coast.

Some new localities for *G. proximus* are listed below. Unless otherwise stated the specimens were collected and identified by the author. The specimens are kept in the collection of the Zoological Museum, University of Bergen.

Oslo: Östmarka 30 August 1937, 1 ♀ (leg. H. Tambs-Lyche, det. C.A.W. Jeekel).

Östfold: Hvaler, Kirköy 12 April 1938, 1 ♀ (leg. H. Tambs-Lyche, det. C.A.W. Jeekel).

Hordaland: Haus, Haukeland-Brattland 12 May 1935, 1 ♀ (leg. N. Knaben, det. C.A.W. Jeekel), Kvinnherad, Seimsfoss 21 June 1943, 1 ♀ (leg. H. Tambs-Lyche, det. C.A.W. Jeekel), Hordabö, Bövågen 1 May 1946, 1 ♀ (leg. H. Tambs-Lyche, det. C.A.W. Jeekel), Kvinnherad, Ljosmyr 3 June 1964, 6 ♀♀, Ljosmyr 25 May 1968, 2 ♀♀, u/Jemtelandseggi 5 June 1967, 10 ♀♀, Uskedalen 25 May 1968, 1 ♀, Blådalen (övre)

29 May 1968, 2 ♀♀, Blådalen (nedre) 29 May 1968, 1 ♀, Varaldsöy, Varaldsöy 5 June 1966, 1 ♀, Gjermundshavn 8 June 1967, 2 ♀♀, Skånevik, Fjellhaugvann 5 June 1964, 3 ♀♀, Os, Lepsöy mot Storom 25 May 1967, 1 ♀, Herdla, Herdla 9-12 April 1968, 8 ♀♀ (leg. J. Fjeldså), Bömlo, Espevær, Nautöy 19 May 1968, 1 juv. Osterøy, Kleppe 27 June 1968, 1 ♀ (leg. Godske).

Sogn og Fjordane: Gulen, I. Takle 28 June 1944, 1 ♀ (leg. S. Johnsen, det. C.A.W. Jeekel), Austgulen 27 May 1953, 1 ♀ (leg. H. Rost, det. C.A.W. Jeekel).

Nordland: Bodö, Vågsöy 30 June 1967, 8 ♀♀ (leg. J. Fjeldså).

Some specimens of *G. proximus* were of great length. One of the specimens collected at Jemtelandseggi 600 m above sea level, measured 42 mm (with 49 pair of legs). Records from abroad mention 30-35 mm as maximum length.

As far as I can see, all specimens of *G. proximus* collected in Norway are females. This corresponds with what Palmén (1948) says about specimens collected in Denmark, Sweden, and Finland, 'very probably the race of *G. proximus* occurring in Fennoscandia is a parthenogenetic one.'

G. proximus is reported from: Denmark (Lohmander 1957), Sweden (Lohmander 1952, 1953, 1954, 1956), France (Brolemann 1930), Northern Germany (Verhoeff 1934, who states that earlier records from southern and central parts of Germany are due to wrong identification), Hungary and Romania (?) (Schubart 1963). Eason (1964) states that all *G. proximus* reported from Britain have in fact been *G. insculptus*.

DISCUSSION

The reduced claw of the second maxillary telopodite as a character for *G. insculptus* was first mentioned by Brolemann (1909, cited from Verhoeff (1928)). Verhoeff (1928), in his account on *Bothrogeophilus*, has divided this subgenus into two, those with and those without a reduced claw on the second maxillary telopodite.

Attems (1929) in the supplement (p. 352-365) gives a revised account on Geophilidae with a carpophagus structure. The correct numbers of pairs of legs for *G. proximus* given by Attems (1929, p. 354) are 45 - 53, which corresponds exactly with the figures given by Palmén (1948) for specimens from Finland. The numbers of pairs of legs that Palmén (1948) quotes from Attems (1929, p. 164) (max. 63) concerns *G. insculptus*, and it will probably be this species that consists of several races with different numbers of pairs of legs, not *G. proximus* as Palmén says.

Among Geophilidae collected by the author in Hordaland, *G. proximus* is clearly outnumbered by *Necrophloeophagus longicornis* (Leach 1814) and *Brachygeophilus truncorum* (Bergsöe and Meinert 1866), except on localities at greater altitude, where *G. proximus* is most abundant.

REFERENCES

Attems, G. 1929. Geophilomorpha. In Schulze, F. E., Kükenthal, W., Heider, K. & Hesse, R. *Tierreich 52*, 1-388.

Brolemann, H. W. 1909. Feuille j. Natur., N. 466. Quoted from Verhoeff 1928.

Brolemann, H. W. 1930. Éléments d'une faune des Myriopodes de France. Chilopodes. *Faune Fr. 25*, 1-405.

Eason, E. H. 1964. *Centipedes of the British Isles*. London. 294 pp.

Ellingsen, E. 1891. Bidrag til kundskaben om de norske Myriopoders udbredelse. *Forh. Vidensk. Selsk. Krist. 10*, 7.

Ellingsen, E. 1896. Mere om norske Myriopoder. *Forh. Vidensk. Selsk. Krist. 4*, 6.

Ellingsen, E. 1903. Mere om norske Myriopoder II. *Forh. Vidensk. Selsk. Krist. 6*, 7.

Ellingsen, E. 1910. Myriopoda und Pseudoscorpiones. In Strand, E., Neue Beiträge zur Arthropoden-Fauna Norwegens. *Nytt Mag. Naturvid. 48*, 345.

Lohmander, H. 1952. Faunistiskt fältarbete 1948 och 1950 (öster och väster om Vätterens södra del). *Årstr. Göteborgs naturhist. Mus. 1951-1952*, 23-44.

Lohmander, H. 1953. Faunistiskt fältarbete 1951

och 1952 (Södra Småland, östra och mellersta delen). *Årstr. Göteborgs naturhist. Mus. 1953,* 31-83.

Lohmander, H. 1954. Faunistiskt fältarbete 1953 (Västra Småland). *Årstr. Göteborgs naturhist. Mus. 1954,* 27-50.

Lohmander, H. 1956. Faunistiskt fältarbete 1955 (huvudsakligen Södra Värmland). *Årstr. Göteborgs naturhist. Mus. 1956,* 32-94.

Lohmander, H. 1957. Faunistiskt fältarbete i Nord- och Västjylland 1954 och 1956. *Årstr. Göteborgs naturhist. Mus. 1957,* 29-86.

Palmén, E. 1948. The Chilopoda of eastern Fennoscandia. *Ann. zool. Soc. 'Vanamo', 13* (4), 15.

Porat, C. O. von. 1887. *Forh. skand. Naturf. 13. Möte. 1886,* 111.

Schubart, O. 1963. Diplopoda, Symphyla. Pauropoda, Chilopoda. *Tierwelt Mitteleur. 2 (3), Ergänzung,* 1-51.

Storm, V. 1898. Myriopoda & Oniscoida ved Trondhjem. *K. norske Vidensk. Selsk. Skr. 8,* 4.

Verhoeff, K. W. 1928. Geophilomorphen-Beiträge und eine Lithobius-Form. *Mitt. zool. Mus. Berl. 14,* 229-286.

Verhoeff, K. W. 1934. Diplopoda, Symphyla. Pauropoda, Chilopoda. *Tierwelt Mitteleur. 2 (3),* 1-119.

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Notes on Coleoptera in Nests of Heron (*Ardea cinerea* L.)

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Fjellberg, A. 1969. Notes on Coleoptera in nests of heron (*Ardea cinerea* L.). *Norsk ent. Tidsskr. 16,* 13-15.
The Coleoptera of nine nests of heron (*Ardea cinerea* L.) in the vicinity of Bergen were examined. Old nests which had been used for several years had the greatest number of species and specimens.

The Coleoptera fauna in nests of heron has not been investigated previously in Norway. The heron breeds in colonies, mainly along the coast of Western Norway northwards to Lofoten, but the species is steadily expanding its range. I have collected nest samples from two colonies near Bergen. The nest material was sifted on the spot and brought back home for sorting.

The first colony is situated on the Island of Råna outside Bildöy, HOy:Fjell. Plantations of mountain pine on the island in places constitute impenetrable thickets. In the interior of the island are areas of marsh with *Sphagnum* and *Calluna*. Some heron breed scattered in the mountain pines, but the main colony inhabits an old plantation of tall spruce. Approximately 50-60 pairs breed in the area. On 4 June 1968 samples were taken from 4 nests.

Nest No. 1 was located in a mountain pine 3-4 m above the ground. The nest, built of pine twigs, was approximately 1.5 m high. The nest bottom had debris layers deposited during several years The deeper debris layers, which had become partly humified, were soaked with excrement and were mixed with fish residue. The nest material smelled strongly. In the nest were 4 small chicks and one egg.

Nest No. 2 was located in a spruce 5-6 m above the ground. The nest-bowl, held together by excrement, was wet to a depth of about 30 cm. There was much less sift material than in nest No. 1. The nest contained 3 large chicks.

Nest No. 3 was similar to nest No. 2, and was situated close to it. It contained 3 large chicks. The sift material was put together with the material from nest No. 2.

Nest No. 4 was found in a spruce 8-10 m

Table I. Coleoptera found in nests of heron (*Ardea cinerea* L.)

Species	Number of specimens in nest No.							
	1	2+3	4	5	6	7	8	9
Cercyon analis Payk.				1				
Necrophorus vespilloides Hbst.	1							
Sciodrepoides fumata Spence	50	6		> 100	1	3		
Euryptilium marginatum Aubé				3				
Acrotrichis fascicularis Hbst.	1							
Omalium exiguum Gyll.				1				
O. septentrionis Th.	38	9		56		7	1	
Philonthus nigriventris Th.				1				
P. politus L.	1			3				
Quedius mesomelinus Mrsh.	1							
Atheta arenicola Th.	7			13				
A. atramentaria Gyll.				1				
A. divisa Märk.		1			1			
A. harwoodi Will.		2		1				
A. nigricornis Th.	6	3		29	3	1	2	
A. occulta Er.				1				
Gnathoncus nanus Scriba	13	33	3	1	3	3		1
Atomaria apicalis Er.	1	3		1				
Number of specimens	119	57	3	> 212	8	14	3	1
Number of species	10	7	1	14	4	4	2	1

above the ground. This was a large nest with 3 large chicks, but with the exception of a dry layer of excrement, there was little sift material.

The other colony investigated was situated on one of the small Kvitholm Islands NE of the abandoned air-field at Herdla, HOy: Herdla. On this island mountain pine is also planted, but here it has grown taller. In contrast to the meagre conditions at Råna, here there is a thriving low vegetation of ferns, *Sorbus acuparia, Sambucus, Salix, Lonicera, Rubus idaeus,* and other plants. Approximately 30 nests were occupied, most of them in mountain pine. Samples from 5 nests were collected on 9 June 1968.

Nest No. 5 was in mountain pine, approximately 3.5 m above the ground. The nest was built of twigs, the nest-bowl of heather, ferns, and excrement. In the bottom of the nest there was much wet material which had become partly humified. The material contained numerous, empty fly pupae. The nest contained 1 large chick and 3 eggs.

Nest No. 6 was found in a mountain pine approximately 3.5 m above the ground. The bottom of the nest was a compact mass of heather, excrement, and fish residue. Under this layer there was only dry material of ferns and twigs. Three large chicks, little sift material found.

Nest No. 7 was built about 4 m above the ground in a mountain pine. Same type of nest as No. 6, with 3 large chicks and little sift material.

Nest No. 8 was built in a mountain pine about 4.5 m above the ground. The nest-bowl contained coarse heather material with excrement and fish remains. Little sift material present. The chicks had left the nest, but one egg remained.

Nest No. 9 was found 3.5 m above the ground in a mountain pine. The bottom of the nest was thoroughly moistened by odorous wet excrement, containing some fly larvae. Little sift material. There were 3 large chicks in the nest.

Nests No. 4, 6, 7, 8, and 9 were probably of recent date. They had no soil in the bottom, which takes some years to form.

DISCUSSION

The material collected was not intended for a quantitative study. Very large nests (nest No. 5 and No. 1) probably contained more species and specimens than Table I indicates. However, in Table I some distinctive traits are obvious.

Newly built nests are rather airy and dry and are not good biotopes for insects. The first Coleoptera to colonize such nests are, as expected, typical nest species such as *Atheta nigricornis* and *Gnathoncus nanus*.

The young heron leave their semifluid excrement in the nest. Together with scraps of food and other debris these will gradually build up a layer in the bottom of the nest, thus paving the way for some more species. The largest number of species and specimens are found in old nests with several layers in their bottom. The old nest material gradually humifies, while a fresh layer of dung and debris is added each breeding season. The liquid excrement soaks the underlaying more or less humified material and makes a biotope in which *Omalium septentrionis* and especially *Sciodrepoides fumata* seem to thrive. Some species are only found in this type of nest, though, never in great abundance (*Necrophorus vespilloides, Cercyon analis, Eurylium marginatum, Acrotrichis fascicularis, Omalium exiguum, Philonthus nigriventris, P. politus, Quedius mesomelinus, Atheta areni-cola, A. atramentaria,* and *A. occulta*). Among these one will also find the least typical nest species.

The mass occurrence of *Sciodrepoides fumata* is remarkable. Hicks (1961) has not mentioned this species from herons nests. Strand (1967) found one specimen in a nest of a kestrel (*Falco tinnunculus* L). It is also somewhat strange that *S. fumata* occurs, while the closely related species *S. watsoni* Spence does not, as the latter has been found in other bird-nests, viz. in a nest of buzzard (*Buteo buteo* L.) and rough-legged buzzard (*Buteo lagopus* L.) (Strand 1967). I have found it in a nest of tawny owl (*Strix aluco* L.) near Bergen, where both species may also be found together, near carrion, etc.

It would also be of interest to investigate heron nests which are built on the ground. These may perhaps harbour a larger number of species than do nests in trees.

ACKNOWLEDGEMENTS

I am indebted to Dr. Andreas Strand, who has verified my indentification of some of the species, and to taxidermist Gunnar Langhelle, who made it possible for me to visit the colonies while he was ringing the chicks.

REFERENCES

Hicks, E. A. 1961. *Check-list and bibliography of insects in birds' nests.* The Iowa State College Press, Ames.

Strand, A. 1967. Coleoptera i rovfuglreir. *Norsk ent. Tidsskr. 14,* 1-11.

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Koleopterologiske bidrag XIV

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Strand, A. 1969. Koleopterologiske bidrag XIV. *Norsk ent. Tidsskr. 16,* 17-22.

Es wird auf einige für die norwegische Fauna interessante Käferarten aufmerksam gemacht, darunter die folgenden für Norwegen neue Arten: *Scaphosoma boreale* Lundbl., *Anthocomus bipunctatus* Harr., *Dirrhagus lepidus* Rosh., *Hypocoelus procerulus* Mannh., *Atomaria strandi* C. Johnson, *Longitarsus reichei* All. und *Apion hookeri* Kby. Ferner werden zwei auffallende Tiere erwähnt die als extrem monströse *Megasternum obscurum* Marsh. und *Hypolithus riparius* F. angesehen werden.

Helophorus walkeri Sharp. I min *Helophorus*-artikkel (Strand 1965) er tegnet to aedeagusformer for *flavipes* F. Kevan (1965) mener at den ene av dem gjelder *walkeri,* som i så fall ville være ny for Norge. Jeg har ikke kunnet være enig i det. At basalstykket synes å være kortere enn normalt skyldes at det delvis overlappes av paramerene. For å få saken sikkert avgjort har jeg latt *Helophorus*-spesialisten R. B. Angus se eksemplaret, og han bekrefter at det er *flavipes.*

Megasternum obscurum Marsh. (*boletophagum* auct. nec Marsh.). Ifölge Kloet & Hincks (1945) skal den arten som hittil er gått under navnet *boletophagum* Marsh. hete *obscurum* Marsh., idet *boletophagum* Marsh. er synonym til *Cercyon tristis* Ill.

Den 23/7 1963 fant jeg i en jordrottegang på AK: Brönnöya en ♂ av en *Megasternum* som avviker sterkt fra *obscurum,* som er den eneste europeiske art av slekten. Dekkvingene er meget kortere, mer runde og med mindre spisse sömhjörner enn hos *obscurum,* fargen på siste kjevepalpeledd og fölehornsköllen er mørk, dekkvingene har meget kraftigere og mer uregelmessig punktering og mikroskulpturen er mer utvisket. Aedeagus er som hos *obscurum.*

Eksemplaret har vært undersökt av Peter Hammond ved British Museum, som sier at det i museets materiale nok finnes eksemplarer som nærmer seg mitt i farge og skulptur, men ingen med en kombinasjon av alle de nevnte avvikelser. Så vel han som spesialisten Balfour-Browne mener imidlertid at det sannsynligvis er et monströst eksemplar av *obscurum,* og at avvikelsene kan skyldes en abnorm utvikling av puppen.

Ptenidium intermedium Wank. Denne overalt sjeldne arten, som er mest funnet på fuktig, til dels meget fuktig, underlag og bl. a. i moldvarp- og jordrottebol, har jeg tatt i antall i mai og juni ved AK : Röa flygende over et område med til dels gammelt granbarkavfall i kanten av en elv. Den er også tatt enkeltvis i oppskyll i august.

Acrotrichis plantonoffi Renk. Denne arten, som hos oss tidligere bare har vært oppgitt fra noen steder i HEn, har jeg tatt i hårrester etter et elgkadaver i AK : Sörkedalen sammen med en lang rekke eksemplarer av *Acrotrichis insularis* Mäkl., i råtten sopp i AK: Setskog og i saft fra björkestubber ved On : Vålåsjö. Den er også tatt i TR i : Nordreisa av Sjöberg og i Fö : Vaggatem i en fangstfelle satt opp av Bakke.

Scaphosoma boreale Lundbl. Denne arten, som forholdsvis nylig er beskrevet, har ifölge spesialisten Löbl vist seg å ha en stor utbredelse over N.- og M.-Europa sör til Albania, Italia og Spania. Den 25/5 1967 fant jeg på en sopp på en liggende, gammel stokk av *Sorbus aucuparia* 3 eksemplarer nær HEs : Kongsvinger. Arten var tidligere ikke kjent fra Norge.

Omalium munsteri Bernh. Arten er beskrevet etter eksemplarer tatt av Munster i kanten AK : Östensjövannet. Den er dessuten funnet av Lysholm ved NTi : Steinkjer og er ellers bare kjent fra en del steder i Finland. Den 15/5, 29/10 og 5/11 1967 fisket jeg opp i alt 3 eksemplarer blant rusk i elven i AK : Lommedal. Munster oppgir å ha tatt sine eksemplarer tidlig om våren, det har også vært tilfelle med mine tidligere funn. Etter de siste funn ser det ut til at arten klekkes sent på hösten.

Stenus ludyi Fauv. (*coarcticollis* auct. nec Epp.). Denne navneendring er nylig blitt publisert av Puthz (1966).

Mycetoporus baudueri Rey (*hellieseni* A. Str.) og *erichsonanus* Fagel. Jeg har tidligere (Strand 1950) påvist at den arten som har gått under navnet *baudueri,* i virkeligheten består av to arter. Mens den ene hos oss er funnet på en rekke steder i N.-Norge og de sentrale fjelltrakter samt ved STi : Trondheim, er den andre, som jeg beskrev som *hellieseni,* bare tatt på noen få steder i den sörvestligste del av landet (AAy : Grimstad, VAy : Lyngdal og Ry : Jæren og Stavanger).

Nå viser det seg, som Fagel (1965) nylig har påvist, at det er *hellieseni* som er den virkelige *baudueri,* mens den andre arten, som har gått under navnet *baudueri,* er blitt kalt *erichsonanus* Fagel.

Ifölge Fagel (1965) er *baudueri* en mer typisk vestlig art enn *erichsonanus,* med en utbredelse som strekker seg fra Algerie langs de vestlige kyster opp til Sverige og Norge. Som nevnt er utbredelsen i Norge typisk vestlig.

Mycetoporus longulus Mannh. Det har vist seg at de eksemplarer som Munster har som *longulus* i sin samling, i virkeligheten består av to andre arter, nemlig *brunneus* Marsh. og *despectus* A. Str. Ett eksemplar av hver av artene har en seddel som angir at bestemmelsen er kontrollert av Luze. Jeg kjenner ikke til andre norske funn av *longulus* enn de 5 eksemplarer som jeg har tatt på AK : Röa, Oslo, dels flygende og dels i oppskyll.

Tachyporus scutellaris Rye. Denne arten, som har tyngdepunktet av sin utbredelse i N.-Europa, er (Horion 1967) oppgitt å være hygrophil. På AK : Röa har jeg tidlig om våren tatt en rekke eksemplarer ved å sikte gammelt löv ved roten av lövtrær i en bakkeskråning på tört underlag.

Gyrophaena angustata Steph. Ifölge Horion (1967) skal den arten som hittil er gått under navnet *manca* Er. nå hete *angustata* Steph.

Pseudomicrodota paganettii Bernh. Ifölge Jarrige (1968) er denne arten den samme som *jelineki Krasa (flavicollis* Brundin).

Atheta (Microdota) liliputana Bris. Jarrige (1968) har undersökt Brisouts type og brakt på det rene at denne arten er den samme som *alpina* G. Bck.

Atheta (Microdota) minuscula Bris. Jarrige (1968) har også undersökt typen av denne arten og funnet at den er den samme som *perexigua* Sharp.

Atheta parapicipennis Brund. Arten er beskrevet etter noen få eksemplarer fra Jämtland i Sverige, TRi : Framnes, Målselv og Fn : Lakselv i Norge, samt 'Transsylvania'.

Det har vist seg at arten har en langt større utbredelse i Norge, idet den er funnet også på följende steder: AK: Röa, Sörkedalen og Setskog, HEn: Gutulia, On: Vålåsjö, VE: Tjöme, TEy: Siljan og AAi: Bygland.

På et unntak nær er dyrene tatt ut på hösten, mest i forskjellig slags lort (menneske, elg, sau, jordugle) og en gang i råtten sopp. I TRi : Solvang, Målselv ble den tatt i antall i et uthus.

Oxypoda griseosericans Roub. Arten er beskrevet etter eksemplar(er) bl. a. fra Fö: Sörvaranger. Jeg har holdt den for identisk med *funebris* Kr. og har fört den opp som synonym til denne art med et ? foran i den nordiske billekatalogen. Lohse har nå (Horion 1967) undersökt materiale i Roubals samling og brakt på det rene at den virkelig er *funebris*.

Aleochara sanguinea L. Av denne arten, som fortrinsvis holder til i hönsehus, dueslag og hule trær med fuglereir eller flaggermus, har jeg ved Bö: Stein tatt en rekke eksemplarer i utflytende saft fra *Cossus*-gnag på en poppel.

Aleochara spadicea Er. Horion (1967) oppgir at denne arten har spesialisert seg på de underjordiske bol av moldvarpen, og at de mange funn av arten i bl. a. musebol antagelig gjelder tidligere moldvarpbol. Arten er imidlertid funnet på en del steder, til dels i antall, i jordrottebol i Norge, hvor moldvarpen mangler.

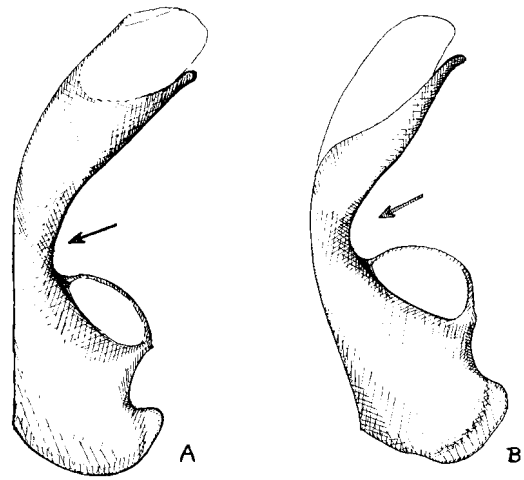

Fig. 1. Penis in Lateralansicht von: A. *Aleochara diversa* J. Sahlb. Kongsvinger, Norwegian (A. Strand), B. *Aleochara stichai* Likovsky Brønnøya, Asker, Norwegen (A. Strand). Anders Vik del.

Aleochara albovillosa Bernh. (*diversa* auct. nec J. Sahlb.). Likovsky (1968) har nylig ved typeundersökelser påvist at *diversa J. Sahlb.* har vært feiltolket, og at den arten som vanlig går under dette navn, skal hete *albovillosa* Bernh.

Den art som *diversa* står nærmest er *stichai* Likovsky. Den eneste forskjell som Likovsky oppgir er at preputialsekkens pigg i penis hos *diversa* er svakt og noenlunde jevnt böyd, mens den hos *stichai* er sterkt, mer vinkelformet böyd, ca. 90°.

Det er imidlertid også en liten forskjell i penis sett fra siden. Den konkave siden er jevnere böyd hos *diversa* enn hos *stichai*, som vist i fig. 1A og 1B.

Diversa ser ut til å være en ytterst sjelden art. Likovsky kjenner foruten typen bare 4 eksemplarer, nemlig ett fra Norge (Kongsvinger), ett fra Sverige (Ombergtrakten) og to fra Italia (Rom). Foruten fra Kongsvinger har jeg et eksemplar fra Lichtenwald Styr. (Dr. Wradatsch). Bestemmelsen er kontrollert av Likovsky.

Anthocomus bipunctatus Harr. Arten er kjent fra M.- og S.-Europa og Kaukasus og har vært tatt så langt nord som i Hamburg—Lübeck-traktene, hvor den er vanlig. Arten holder til på blomstrende trær og busker og er også tatt på klöver. Ifölge Horion (1953) overvintrer dyrene ofte i hus og kommer fram tidlig om våren.

Den 8/5 1968 fant K. E. Zachariassen 4 eksemplarer på veggen i et kjökken i AK : Oslo.

Hypolithus riparius F. Denne arten er bl. a. karakterisert ved bronseaktig farge, tydelig, mest sterk mikroskulptur på brystskjoldet og fint punkterte stripemellomrom på dekkvingene.

På HOi : Finse har universitetslektor Eivind Östbye tatt et eksemplar som i form stemmer med *riparius*, men som er meget tydelig forskjellig fra den ved ren sort, på det ene dekkvinge rödlig farge, ved speilblank brystskjold uten tegn til mikroskulptur og ved kraftig punktering på dekkvingenes stripemellomrom.

Den forskjellige farge på dekkvingene er jo unormal, men ikke ukjent. Således har Lindroth latt meg se et par islandske eksemplarer av *riparius* med delvis rufinisme på dekkvingene, men de skiller seg ellers ikke fra *riparius*.

Det er vel det sannsynligste at det dreier seg om en abnorm *riparius*.

Dirrhagus lepidus Rosh. Palm (1958) har gitt en oversikt over de nordiske arter av underslekten *Microrrhagus* Eschz. av slekten *Dirrhagus* Latr.

Fra de nordiske land er kjent tre arter, nemlig *pygmaeus* F., som er funnet på en rekke steder i Danmark, Sverige, Finland og Norge, *lepidus* Rosh. som er kjent fra en lokalitet i Sverige og også fra Finland, samt *lindbergi* Palm som er funnet på en lokalitet i Finland.

Hittil har altså bare *pygmaeus* vært kjent fra Norge. I Oslomuseets materiale står imidlertid en ♂ som er en utvilsom *lepidus*. Den er funnet av Berg, sannsynligvis i TEy : Kragerötrakten hvor Berg bl. a. samlet. Munster har tatt en ♀ i TEy : Sandnes i Drangedal og i TEy : Siljan har Bakke tatt en ♀ i en fangstfelle. Eksemplarene har vært sammenliknet med ♂♀ som Stig Lundberg har tatt ved München.

Normalt er *lepidus* större enn *pygmaeus*, gruben på begge sider av brystskjoldet er större, scutellum er sterkere opphöyet og sett ovenfra sterkere avsmalnet mot spissen, dekkvingenes behåring er noe finere og dekkvingene er tydeligere stripet. Hos ♂ er de kamformete forlengelser av fölehornsleddene meget lengre, og hos ♀ er fölehornsleddene 4.—10. tydeligere sagtakket.

Arten er en stor sjeldenhet, som foruten i de nordiske land er funnet på spredte steder i M.- og S.-Europa.

Hypocoelus procerulus Mannh. Den 24/7 1968 tok Bakke i en felle ved AK : Syverud i Ås 4 eksemplarer av denne arten, som er ny for Norge. Arten som er en stor sjeldenhet, er i de nordiske land tidligere funnet på noen få steder i Sverige og Finland.

Atomaria strandi C. Johnson. Denne nylig beskrevne arten (Johnson 1967) står nær *atrata* Reitt. og den meget sterkt varierende *prolixa* Er., men den er mindre hvelvet og mer langstrakt, uten eller med bare en antydet fure langs bakkanten av brystskjoldet, dekkvingene har rettere sider, svakere punktering og sterkere mikroskulptur, fölehornene er litt lengre og især köllen er slankere, særlig gjelder det *atrata*, men også gjennomsnittet av *prolixa*, fargen er brun, mörkere på hode og brystskjold enn på dekkvingene. Johnson har også pekt på en del forskjelligheter i genitaliene.

Arten har jeg tatt på følgende steder: AK : Asker, Gaustad, Bygdöy, Röa og Brönnöya. Den er også funnet på en del steder på de Britiske öyer.

Mine eksemplarer, som Johnson har sett, er tatt ved roten av trær, i et tilfelle sammen med *Lasius fuliginosus*, i hönselort, i et uthus og i flytende materiale i en elv.

Phloeotrya rufipes Gyll. Av denne arten

som i Norge tidligere bare var kjent fra Bö : Modum (Moe) og AAy : Risör (Warloe), har Sigurd Andreas Bakke klekt fire eksemplarer av morkne hasselkvister fra AAy : Bjelland, Tromöy.

Longitarsus nigrofasciatus Goeze. I første halvdel av september 1961 tok jeg på AK : Brönnöya en rekke eksemplarer av denne arten, som var ny for Norden, allesammen ved håving på *Campanula trachelium*. De følgende år har jeg forgjeves sökt etter den, men den 24/7 1967 fant jeg 3 helt nyklekte eksemplarer på *Verbascum thapsus*, altså den planten arten normalt er knyttet til.

Longitarsus reichei All. (*fuscula* Kutsch.). På AK : Brönnöya håvet jeg den 14/8 1965 to eksemplarer (begge ♀♀) av en *Longitarsus* som var ukjent for meg. Victor Hansen, som har sett eksemplarene, antydet at det kunne være *reichei*, en art som så vidt jeg vet tidligere bare er kjent fra Frankrike og de Britiske öyer. Litt senere sendte Colin Johnson meg en ♂ av *reichei*, som syntes å bekrefte at mine eksemplarer er denne art. Bestemmelsen er også bekreftet av Kevan, som nylig (Kevan 1967) har behandlet de britiske *Longitarsus*-arter og bl. a., liksom Allen (1967), så vidt jeg vet for første gang, har gjort oppmerksom på at spermathecaen hos denne slekt stort sett gir gode holdepunkter ved bestemmelsen av artene.

Reichei står meget nær *pratensis*, men den har tydeligere panneknuter enn denne arten, dekkvingene er dypere og kraftigere punktert, sidene av penis er praktisk talt rette og parallelle, mens de hos *pratensis* er noe innbuet på midten, og dessuten har röret som står i forbindelse med kapselen i spermathecaen noen få slöyfer like ved inngangen til kapselen, mens röret hos *pratensis* er enkelt uten slöyfer.

Arten skal leve på strandstjerne (*Aster tripolium* L.), men Allen (1968) opplyser at han foruten på strandstjerne har tatt et eksemplar på *Prunella vulgaris* L. og to par ved håving på *Ballota nigra* L.

Apion hookeri Kby. Av denne arten, som er ny for Norge, håvet G. Taksdal et eksemplar på Ö : Slevik Onsöy den 10/8 1967.

Dorytomus affinis Payk. Arten var hos oss tidligere bare kjent fra S.-Norge opp til HEn : Femundsenden, men i juli 1924 tok jeg et eksemplar ved Fi : Jotkajavrre.

LITTERATUR

Allen, A. A. 1967. Two new species of *Longitarsus* Latr. (Col., Chrysomelidae) in Britain. *Entomologist's mon. Mag. 103*, 75-82.

Allen, A. A. 1968. Notes on *Longitarsus reichei* Allard etc. (Col., Chrysomelidae), with special reference to foodplants. *Entomologist's mon. Mag. 103*, 154-155.

Fagel, G. 1965. Contribution à la connaissance des Staphylinidae. XC. Remarques sur le genre *Mycetoporus* Mannh. et description de nouvelles espèces de Méditerranée orientale. *Bull. Annls Soc. r. ent. Belg. 101*, 29-39.

Horion, A. 1953. *Faunistik der mitteleuropäischen Käfer. Bd. III. Malacodermata, Sternoxia (Elateridae bis Throscidae)*. München.

Horion, A. 1967. *Faunistik der mitteleuropäischen Käfer. Bd. XI: Staphylinidae 3. Teil: Habrocerinae bis Aleocharinae (ohne Subtribus Athetae)*. Überlingen-Bodensee (419 p.).

Jarrige, J. 1968. Sur quelques *Atheta* de la faune de France (Coleoptera Aleocharidae). *Bull. mens. Soc. linn. Lyon 37*, 247-249.

Johnson, C. 1967. Addition and corrections to the British list of *Atomaria* s. str. (Col., Cryptophagidae), including a species new to science. *Entomologist 100*, 39-47.

Kevan, D. K. 1965. The British species of the Genus *Helophorus* Illiger, subgenus *Helophorus* s. str. (Col., Hydrophilidae). *Entomologist's mon. Mag. 101*, 254-268.

Kevan, D. K. 1967. The British species of the Genus *Longitarsus* Latreille (Col., Chrysomelidae). *Entomologist's mon. Mag. 103*, 83-110.

Kloet, G. S. & Hincks, W. D. 1945. *A Check List of British Insects*. Stockport.

Likovsky, Z. 1968. *Aleochara diversa* (J. Sahlberg) — eine Mischart (Coleoptera, Staphylinidae). *Reichenbachia 10*, 133-141.

Palm, T. 1958. *Dirrhagus (Microrrhagus) Lind-*

bergi n. sp., eine neue Käfeart aus Finnland (Eucnemidae). *Ent. Tidskr. 79,* 34-37.

Puthz, V. 1966. Nomenklatorisches und Faunistisches über mitteleuropäische Steninen. *Nachr Bl. bayer. Ent. 15,* 117-123.

Strand, A. 1950. *Mycetoporus Hellieseni* n. sp. *Norsk ent. Tidsskr. 8,* 83.

Strand, A. 1965. De nordiske arter av slekten *Helophorus* F. (Col., Hydrophilidae). *Norsk ent. Tidsskr. 13,* 67-77.

Mottatt 30. desember 1968

Simplocaria metallica Sturm New to Svalbard (Col., Byrrhidae)

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Strand, A. 1969. *Simplocaria metallica* Sturm new to Svalbard (Col., Byrrhidae). *Norsk ent. Tidsskr. 16,* 23-24.
In Svalbard a *Simplocaria* specimen has recently been found, which the author considers to be *metallica,* although it differs from this species in puncturation of pronotum and elytra.

Participating in the Norsk Polarinstitutt's biological field work in Svalbard, cand. mag. Sigmund Hågvar took a dead specimen of a *Simplocaria* species on Ossian Sarsfjellet east of Ny-Ålesund on the 23rd July 1968. The specimen was found under a stone on moss at an altitude of about 40 m, not far from the coast. It is in an advanced state of decay, practically all the extremities are lacking, and on both elytra, close to the apex, a piece is lacking as if picked out.

The pubescence is decumbent, the pronotum finely punctured, the striae of the elytra are strong, the sutural stria entire, the second ceasing at the middle, the other striae reaching the apical part, the inner interstices rather strongly punctured.

No *Simplocaria* species has been found earlier in Svalbard, nor is the genus represented in Iceland.

In the western part of Greenland a *Simplocaria* species has been found in several localities. The species has been considered as *metallica* Sturm (Henriksen and Lundbeck 1918), but according to Lindroth (1957) it is identical with *tessellata* Lec. from North America. Specimens which Lindroth has sent me as probable *tessellata* are distinct from the Svalbard specimen.

According to Poppius (1904, 1910) and Winkler (1924-1932) the following *Simplocaria* species are known from the Northern parts of Russia and Siberia: *basalis* Sahlb., *obscuripes* Popp., *macularis* Reitt., *palmeni* Popp., *elongata* J. Sahlb., *nebulosa* Popp., and *arctica* Popp.

In the first two the pubescence is raised, and accordingly they belong to a different group than the Svalbard specimen.

Macularis differs from this specimen by

having the pronotum stronger and more densely punctured and the striae of the elytra shorter.

Of the four others the Zoological Museum of the University of Helsingfors has sent me a few specimens for examination.

Of these species the one to which the Svalbard specimen comes nearest is *elongata*. Of the three specimens received two are from Krasnojarsk and one from the Kanin peninsula. The Kanin specimen has the elytra much more strongly punctured than the other two, and it is questionable whether they all belong to the same species. The puncturation of the pronotum is the same in the Svalbard specimen as in *elongata*, and the puncturation of the elytra is somewhere between the Kanin specimen and the Krasnojarsk specimens. However, the form of the pronotum is different, in *elongata* the sides are more steeply sloping and strongly convex than in the Svalbard specimen.

The species that comes nearest to the Svalbard specimen seems to be *metallica* Sturm. The differences concern the puncturation, which is much finer on the pronotum and somewhat stronger on the elytra in the Svalbard specimen than in *metallica*.

How closely related they are is difficult to say on the basis of a single specimen; however, I am inclined to consider it as belonging to *metallica*.

Simplocaria metallica is a European species with boreo-alpine distribution, in North Europe occurring in three separate areas, viz. the Northern part of Fennoscandia, the mountains in the central part of South Norway, and some localities in South Finland and the adjacent part of Russia (Holdhaus and Lindroth 1939). To this distribution must now be added Svalbard.

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REFERENCES

Henriksen, K. L. & Lundbeck, W. 1918. Landarthropoder (Insecta et Arachnida). *Meddr. Grönland 22*, 481-821.

Holdhaus, K. & Lindroth, C. H. 1939. Die europäischen Koleopteren mit boreoalpiner Verbreitung. *Annln. naturh. Mus. Wien 50*, 123-293.

Lindroth, C. H. 1957. *The faunal connections between Europe and North America*. Almqvist & Wicksell, Stockholm, and John Wiley & Sons, Inc., New York.

Poppius, B. 1904. Neue paläarktische Coleopteren. *Öfvers. K. Vetensk. Akad. Förh.* XLVI No. 16.

Poppius, B. 1910. Die Coleopteren des arktischen Gebietes. *Fauna arct. 5*, 289-447.

Winkler, A. 1924-1932. *Catalogus Coleopterorum regionis palaearcticae*. Albert Winkler, Wien.

Sex Pheromone in Females of *Erannis aurantiaria* Hb. and *Erannis defoliaria* Cl. (Lep., Geometridae)

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Tvermyr, S. 1969. Sex pheromone in females of *Erannis aurantiaria* Hb. and *Erannis defoliaria* Cl. (Lep. Geometridae). *Norsk ent. Tidsskr. 16,* 25-28. Studies in deciduous forests in Southern Norway in autumn 1968 demonstrated attractants which were released by the females of *Erannis aurantiaria* Hb. and *Erannis defoliaria* Cl. Female moths placed in traps with sticky surfaces attracted numerous males during the night. From October 22 to October 31 a total of 358 *E. aurantiaria* males were caught in 7 traps containing 10 females. In a trap baited with 2 *E. defoliaria* females only 5 males were caught, but it seems highly probable that an attractant exists in this species too. The attractants seem highly specific, but if traps had been baited with females one night the empty trap did not attract males the following night. In traps baited with both sexes of *E. aurantiaria* no males were caught.

During recent years considerable progress has been made in the study of insect attractants. Jacobson (1965) lists 154 species in which the females lure the males, and 53 species in which males lure or excite the females. The bulk of these species belong to the order Lepidoptera.

The larvae of *Erannis aurantiaria* Hb. and *Erannis defoliaria* Cl., together with other geometrid larvae, cause severe defoliation on deciduous forests in Southern Norway. Several of these species have wingless or vestigial-winged females. This peculiarity makes it reasonable to assume that the females release scents to attract the males. Females of *E. aurantiaria* have vestigial wings, unable to fly, whereas *E. defoliaria* females are completely wingless. Both species show marked autumnal and nocturnal behavior as adults. Preliminary observations indicated that adult females could lure males.

MATERIAL AND METHODS

Studies were made from October 21 to 31, at times when adults were emerging from pupae in litter on the forest floor. The females used as baits in the experiment had been collected earlier in the autumn as pupae in Hövåg, Aust-Agder county. The pupae were kept in moist sand under outdoor conditions until the adults emerged.

Traps were constructed from 3 cm thick polystyrene sheets ('Isopor') measuring about 35 × 50 cm (Eck 1967). Through a hole in the center was placed a metal cylinder, 10 cm in diameter and 12 cm long. The end of the cylinder was made from fine meshed wire screen allowing wind to blow through, but preventing the females from escaping (Fig. 1).

The sheets were coated with a thin layer

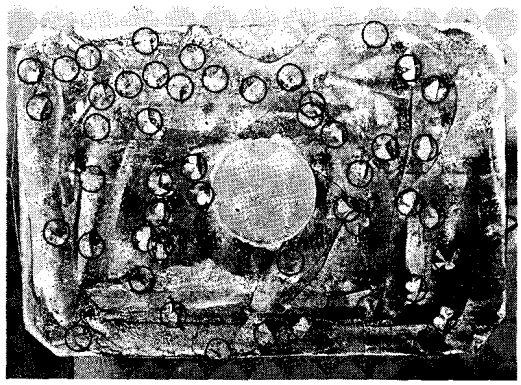

Fig. 1. A trap with one night's catch of 47 *E. aurantiaria* males on the side turned away from the wind. On the windward side no males were caught. The moths are marked with rings.

of tanglefoot (OH-Raupenleim, manufactured by Hinsberg Pflanzenschutz, Germany). This tanglefoot may be used for a long time without drying. Traps were placed at two stations:

Station I.: Dyrlökke, Frogn, Akershus county. Five traps were hung in a steep, southerly exposed slope stocked with oak *(Quercus* spp.), aspen *(Populus tremulae)* and some spruce *(Picea abies)*. Altitude was about 50 m and distance from sea (Oslo Fjord) 2 km.

Station II.: Kambo, Moss, Östfold county. Seven traps were placed on even land stocked with oak, birch *(Betula verrucosa)* and pine *(Pinus silvestris)*. Altitude was 20 m and distance from Oslo Fjord 0.4 km.

At each station the traps were hung at 15 m intervals in a row 1.5 m above the ground. All traps were exposed to westerly wind and were placed with their flat sides across the wind direction. The traps were baited with newly emerged virgin females. No females were older than 24 hours when introduced. The traps were checked every morning and captured males were removed. The emergence of *E. aurantiaria* females coincided with a period dominated by warm westerly wind giving high night temperatures. From October 30 there was a turn in the weather, being dominated by cold wind from the northeast. Only two *E. defoliaria* females emerged before the winter put a stop to further investigations.

Temperature records are given by The Agricultural College of Norway, Department of Physics and Meteorology, and measured at Vollebekk, about 5 km from Station I, and 21 km from Station II. Windy weather during most of the nights surely smoothed out possible temperature contrasts caused by distance.

RESULTS

E. defoliaria females emerged too late to give abundant catches, but the few males captured strongly suggest that a sex attractant exists in this species too. After the introduction of two females in a trap on October 29, five males were caught within the following 24 hrs.

In *E. aurantiaria* females the presence of a potent sex attractant was clearly indicated (Tab. I and Fig. 1). The following discussion is related to this species only. In all cases greatest catches were made the first night after introduction of the females. This may indicate that newly emerged females are more attractive than older ones. But these nights, Oct. 22 and 23, coincided with high temperatures, and therefore presumably with high flight activity. The following nights temperature showed strong fluctuations. Undoubtedly temperature strongly affects flight activity (Tab. II). The nights before Oct. 24 and 25, temperature dropped to zero and below, giving no catches at all. The nights before Oct. 26 and 30 the temperature again was higher and 17 and 4 males were caught, respectively. The oldest females eliciting male response were 9 days old.

The attractivity seems to be affected by the number of females in the traps. Traps baited with 1, 2 and 4 females caught 18, 41 and 59 males respectively during the same night. If a trap had been baited with females one night and the females then were removed, the trap showed no attractive effect the following nights. When one female and one male were placed together in the trap no males were caught.

Table I. Number of *E. aurantiaria* males attracted to traps baited in various ways

Station	Trap No.	Baiting and date of introduction	Number of males caught									
			Oct. 22	23	24	25	26	27	28	29	30	31	Total
I	1	3♀♀ 21[a]	47										47
	2	3♀♀ 22		9			7						16
	3	no females											
	4	1♀, 1♂ 21											
II	5	1♀ 22		18									18
	6	2♀♀ 21[a]	73										73
	7	2♀♀ 22		41									41
	8	4♀♀ 21[a]	82[b]										82[b]
	9	4♀♀ 22		59			10				4		73
	10	1♀, 1♂ 21											
	11	no females											

[a] Females transferred to new trap (following no.) on October 22.
[b] Three specimens were male *Operophthera brumata* L.

Except for one occasion the traps always caught the same species as the bait. In trap No. 8. (tab. I), baited with 4 female *E. aurantiaria*, 3 male *Operophthera brumata* L. were captured on Oct. 22, perhaps only by accident.

The effect of wind was evident (Fig. 1). During the whole trapping period very few males were caught on the windward side of the traps. In one case 73 males were captured on the side turned away from the wind and none on the windward side.

DISCUSSION

Owing to the fluctuation and a general drop in temperature during the trap period it is difficult to estimate the duration of pheromone activity. In *Rhyacionia frustrana* (Com.) Wray & Farrier (1963) found females to be most attractive early in their life span, attracting males up to 9 days. In *Plodia interpunctella* Hb. however, Lehmensick & Liebers (1938) found a weak male response to 15 day old females, whereas Berger et al. (1964) reported that female *P. interpunctella* yielded active extracts regardless of age.

The fact that the traps showed no attracting effect after the females had been removed may indicate that the females do not transfer the attracting substance to the substratum. The substance may also be too volatile to persist during the day. The attractant in *Diatraea saccharalis* (F.) is effective for only a few hours when exposed to the environment on filter paper (Perez & Long 1964). In *Lymantria monacha* L., however, males continued to arrive at traps for 2 to 3 days after the females were removed (Jacobson 1965, p. 18).

Compared with the obvious strong attraction exerted by traps containing only females, the absence of catches on traps baited with both sexes is a remarkable result. If mating took place shortly after the two sexes were

Table II. Relation between nightly minimum temperature and total catch of *E. aurantiaria* males

Date (October)	22	23	24	25	26	27	28	29	30	31
Min. temp. °C	9.4	1.9	−0.6	0.0	2.5	0.7	0.4	1.0	2.2	−1.1
Total catch	199	127	0	0	17	0	0	0	4	0

brought together, one might assume that only virgin females release attractants. This seems to be the case in *Diatraea saccharalis* (F.) (Perez & Long 1964). The females were not examined to ascertain if copulation had oc curred. The possibility exists, however, that only the presence of males inhibits *E. aurantiaria* females in releasing pheromone.

In *Lymantria monacha,* L. Ambros (1937) and Komarek & Pfeffer (1939) reported that females ceased to be attractive after oviposition. Nolte (1940) could not verify this and believed it to be true only if the female had first been fertilized. According to Wray & Farrier (1963) male *Rhyacionia frustrana* (Com.) were attracted to traps even if they contained both sexes. A virgin female *Rhyacionia buoliana* (Schiff.) confined in a small cylinder attracted 31 males in 10 minutes, whereas an ovipositing female attracted 7 and a mated female none (Pointing 1961).

REFERENCES

Ambros, W. 1937. Nonnenfalterkontrolle auf biologischer Grundlage. *Zentrbl. ges. Forstw. 63,* 140-151.

Berger, R. S., McGough, J. M., Martin, D. F. & Ball, L. R. 1964. Some properties and the field evaluation of the pink bollworm sex attractant. *Ann. ent. Soc. Am. 57,* 606-609.

Eck, P. J. van 1967. Sex attraction in lodgepole needle miner. *Bi-mon Res. Notes. Ottawa. 23* (1). 3.

Jacobson, M. 1965. *Insect sex attractants.* John Wiley & Sons, New York and London. 154 pp.

Komarek, J. & Pfeffer, A. 1939. Eine neue biologische Kontrolle der Forstschädlinge. *Verhandl. VIIth Int. Kongr. Ent. 3,* 200-203.

Lehmensick, R. & Liebers, R. 1938. Beiträge zur Biologie der Mikrolepidopteren. (Untersuchungen an Plodia interpunctella Hb.) *Z. angew. Ent. 24,* 582-643.

Nolte, H. W. 1940. Neue Erfahrungen zur Dykschen Nonnenanlockmethode. *Zentrbl. ges. Forstw. 66,* 197-206.

Perez, R. & Long, W. H. 1964. Sex attractant and mating behavior in the sugarcane borer. *J. econ. Ent. 57,* 688-690.

Pointing, P. J. 1961. The biology and behavior of the European pine shoot moth, Rhyacionia buoliana (Schiff.) in Southern Ontario, I: Adult. *Can. Ent. 93,* 1098-1112.

Wray, C. & Farrier, M. H. 1963. Response of the Nantucket pine tip moth to attractants. *J. econ. Ent. 56,* 714-715.

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Nasonovia altaënsis n. sp. (Homoptera, Aphididae) on *Thalictrum rariflorum* Fr.

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Stenseth, C. 1969. *Nasonovia altaënsis* n. sp. (Homoptera, Aphididae) on *Thalictrum rariflorum* Fr. *Norsk ent. Tidsskr. 16,* 29-32.
Apterous and alate viviparous females, oviparous female and alate male of a new aphid species, *Nasonovia altaënsis,* are described. The aphid lived in the inflorescences and top leaves of *Thalictrum rariflorum* Fr., and was found at the locality Aronnes, Alta, Finnmark, Norway.

The aphid described here is known only from *Thalictrum rariflorum* Fr. (Syn. *Th. simplex var. boreale* (F. Nyl.) Fr.) on which it was found in slightly distorted inflorescences and top leaves. The species was taken by Mr. H. B. Gjærum at Aronnes, Alta, Finnmark, Norway, 14 August 1968.

APTEROUS VIVIPAROUS FEMALE

Body oval, 2.4 mm long. Tergum almost completely sclerotic, pale, with small brownish 'muskelplattes' on abdomen; abdominal tergites 7 and 8 with separated pale cross bars. Hairs on head, antennae, legs and dorsum partly with just incrassate apices, on abdomen tergite III spinally about 0.016—0.026 mm long. Frontal tubercles well developed with wrinkled surface, the lateral tubercles with 4-5 hairs, divergent and somewhat higher than the median one. Antennae six-segmented, shorter than the body, inner margin of segment I pale brown like the front of the head, segment II pale; flagellum gradually darker from the pale base toward apex, antennal segments I-IV fairly smooth, V and VI with imbrications, segment III with 3/6 small, not elevated secondary rhinaria arranged on one side of basal half. Length of antennal segments: III, 0.475; IV, 0.345; V, 0.287; VI, 0.140 + 0.494 mm. Hairs on antennal segment III maximally 0.018 mm and about ½ of the basal articular diameter of the segment. Rostrum reaching to about second coxae, apical segment triangular, very blunt, 0.117 mm long with 4 secondary hairs. Siphunculi pale brown, 0.276 mm long, evenly tapering and well developed thin flange, the surface faintly imbricated or wrinkled, with 2-3 rows of trans-

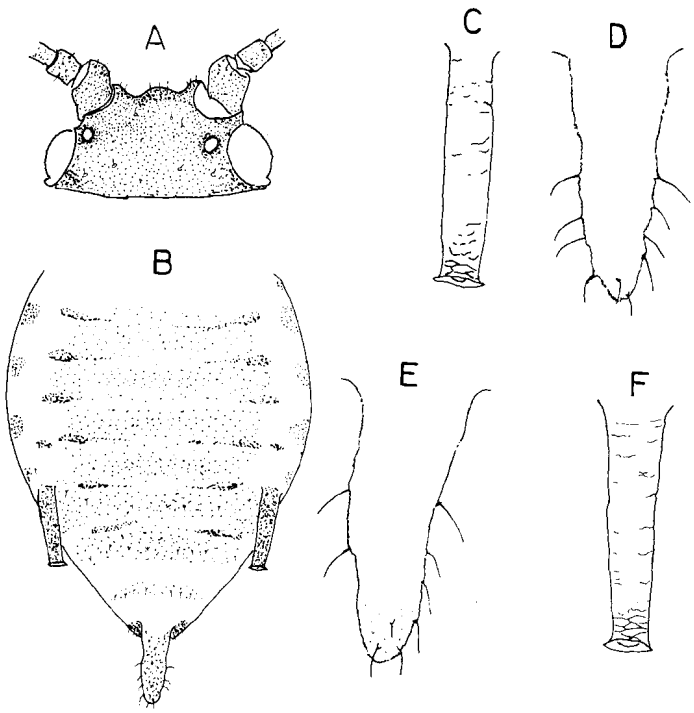

Fig. 1. *Nasonovia altaënsis* n. sp. Al. viv. female; A, head; B, dorsal view of abdomen; C, siphunculus; D, cauda. Apt. viv. female: E, cauda; F, siphunculus.

verse hexagonal cells near the flange. Cauda pale, elongate, triangular, very blunt, 0.32 mm long with 9 hairs. Subgenital plate with 6 anterior and 17 posterior hairs. 8th abdominal tergite with 9 hairs, the longest 0.033 mm. Legs rather pale, tarsus and apical part of tibia brown; first tarsal segment with 3 hairs on each leg, second tarsal segment of hind legs 0.13 mm long.

ALATE VIVIPAROUS FEMALE

Body spindle-shaped, 2.33 mm long. Abdominal dorsum with a pale brown central sclerite on 2nd—5th tergite more or less divided by pale intersegmental lines, and bounded by darker pleural intersegmental sclerites (Fig. 1), tergites 6-8 with faintly pigmented cross bars, 2nd–5th tergites with rather dark brown marginal sclerites. Frontal tubercles well developed, the lateral tubercles divergent with rounded inner apices, not much higher than the large median process. Antennae nearly as long as body, brown, with slightly pale scabrous base to segment III. Secondary rhinaria not in a row along one side of the segments, distributed: III, 23/25; IV, 6/7; V, 0/1. Length of antennal segments: III, 0.54; IV, 0.45; V, 0.35; VI, 0.15 + 0.58 mm. Apical rostral segment 0.104 mm long with 5 secondary hairs. Siphunculi 0.25 mm long, cylindrical, brown, imbricated with some transverse hexagonal cells near the flange. Cauda rather dark, 0.26 mm, elongate, not acute, faintly constricted in the middle part, with 11 hairs. Subgenital plate with 11 anterior and 16 posterior hairs. 8th abdominal tergite with 7 hairs, maximum hair-length 0.031 mm. Hairs on 3rd abdominal tergite maximally 0.026 mm long and shorter than articular diameter of antennal segment III. Small marginal tubercles present on 2nd—5th abdominal tergites. Femora brown with basal part pale, tibia brownish yellow with darker apices. First tarsal joint of each leg with 3 hairs. Second segment of hind tarsus 0.127 mm long. The wings are evenly covered by micro-scales, the venation is normal, but the 2nd fork of the media is rather near the wing's edge, the

veins are brown, rather thick, and the basalis and cubitus faintly and narrowly bordered with brown.

APTEROUS OVIPAROUS FEMALE

Body 2.00—2.13 mm long. Tergum sclerotic, pale or faintly pigmented as in aptera vivipara. Antennae $^{7}/_{10}$-$^{3}/_{4}$ of the length of body, with 1-5 rhinaria on basal part of segment III. Length of antennal segments: III, 0.36—0.4; IV, 0.25—0.30; V, 0.24—0.26: VI, 0.10—0.12 +0.45—0.47 mm. Apical rostral segment 0.096—0.109 mm long with 4—5 secondary hairs. Siphunculi 0.230—0.264 mm long. Cauda 0.230—0.253 mm long, finger-shaped, with 11-14 hairs. Subgenital plate with 48—60 hairs more or less scattered all over the plate. 8th abdominal tergite with 11-17 hairs. Hairs on 3rd and 8th tergite about equal in length, maximally 0.015—0.034 mm long. Tubercles on abdominal tergites 2—5 absent or present, small. Legs yellowish brown, hind tibiae pigmented like the other tibiae. Second segment of hind tarsi 0.124—0.137 mm long, 1.2—1.3 × apical segment of rostrum. Hind tibia very slightly incrassate, with pseudosensoria on basal $^{2}/_{3}$. Other characters as in apterous viviparous female.

ALATE MALE

Body 1.49—1.82 mm long. Abdomen with marginal sclerites on 1st—4th tergites. Pleural intersegmental sclerites and post-siphuncular sclerites present. Sclerotic cross bars on 7th and 8th tergites. Spinopleural cross bars on 1st—6th tergites present, but very irregular or reduced to small sclerotic patches. Sclerites pattern brown, with occasional spinules. Hairs pointed. Antennae 1.3—1.6 × the length of body, brown. Secondary rhinaria distributed: III, 59—77; IV, 32—46; V, 26—29. Length of antennal segments: III, 0.57—0.63; IV, 0.42—0.50; V, 0.32—0.38; VI, 0.09—0.17 + 0.68—0.71 mm. Apical rostral segment 0.091—0.099 mm long with 4—6 hairs. Siphunculi cylindrical 0.172—0.184 mm long; cauda 0.126—0.149 mm long, with 5—9 hairs. 8th abdominal tergite with 8—10 hairs. Legs brown, except a pale basal part of femora. Second segment of hind tarsi 0.122 mm long and 1.2—1.3 × apical segment of rostrum. Other characters as in alate viviparous female.

DISCUSSION

All morphs described here were collected at the same date on *Thalictrum rariflorum*, which indicates that the aphid is a monoecious-holocyclic species.

The structure of the frontal tubercles, shape and surface on siphunculi, and the abdominal sclerotisation indicate the relationship to *Nasonovia* Mordvilkoi (Hille Ris Lambers 1949).

The number of secondary hairs on the apical segment of rostrum and the length of that segment, which is shorter than the second segment of hind tarsus, separate *Nasonovia altaënsis* n.sp. from European species of the genus.

N. altaënsis is closely related to the North American species (*Kakimia* =) *Nasonovia purpurascens* Oestl., but the examined material of *N. altaënsis* has shorter siphunculi, more hairs on cauda and 8th abdominal tergite, and absence of a pale base on siphunculi.

The day length in Alta is about 22 hours on August 1st which means that the sexuales of *N. altaënsis* n.sp. are produced during long days, an unusual characteristic, since most species of aphids produce sexuales in response to short day-length (Hille Ris Lambers 1966). According to Hottes & Frison (1931) and Palmer (1952) the sexuales of *N. purpurascens* Oestl. are produced in mid-summer. This feature also indicates the close relationship between the North American and North Scandinavian species.

TYPES

Holotype: Apterous viviparous female, No. 232/68, Aronnes, Alta, Finnmark 14 August 1968, leg. H.B. Gjærum. In the collection of the Norwegian Plant Protection Institute, Div.

of Entomology. *Paratypes:* One alate viviparous female, four oviparae females and five alatae males. Data as for holotype. In the collection at Dr. D. Hille Ris Lambers, Bennekom, Netherlands, and the Norwegian Plant Protection Institute.

ACKNOWLEDGEMENT

I wish to thank Dr. D. Hille Ris Lambers for information and advice.

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REFERENCES

Hille Ris Lambers, D. 1949. Contribution to a monograph of the Aphididae of Europe IV. *Temminckia 8,* 182-323.

Hille Ris Lambers, D. 1966. Polymorphism in Aphidiae. *A. Rev. Ent. 11,* 47-78.

Hottes, C. F. & Frison, T. H. 1931. The plant lice, or Aphiidae of Illinois. *Bull. Ill. St. nat. Hist. Surv. 19,* 318-319.

Palmer, M. A. 1952. *Aphids of the Rocky Mountain Region.* Thomas Say Foundation, 5. Denver. 452 pp.

Population Studies of *Helophilus hybridus* Loew and *Sericomyia silentis* (Harris) (Dipt., Syrphidae) on Jæren, SW Norway

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Nielsen, T. 1969. Population studies of *Helophilus hybridus* Loew and *Sericomyia silentis* (Harris) (Dipt., Syrphidae) on Jæren, SW Norway. *Norsk ent. Tidsskr. 16,* 33-38.

Populations of two Syrphidae species were estimated by capture-recapture method during a 26 day period in July and August 1965. Daily estimates of the populations were made, as well as of the total number of each of the species flying during the period. Average longevity, and maximum and average individual densities were also estimated.

The investigations were carried out from 19 July to 13 August 1965 in a forest clearing, 1200 sq m in size, at Öksnevad in Klepp municipality (Fig. 1). On three sides this biotope is bounded by dense, well-grown spruce forest or closely planted rows of spruce, forming steep 'walls' facing the biotope, and on the fourth side by a small lake approximately 300 m across (Öksnevad-tjern).

The forest clearing, an area felled some years ago, slopes gently down to the lake. The soil is relatively dry. The vegetation, extremely rich and free flowering, consists for the most part of *Valeriana officinalis, Rubus idaeus, R. nessensis and Calluna vulgaris,* but also contains a smaller element of *Potentilla erecta, Solidago virgaurea* and several species of *Agrostis, Poa, Luzula,* etc.

The area was chosen for several reasons: 1) isolated position — in this otherwise open and sparsely forested countryside it is difficult to find effectively isolated biotopes; 2) favourable climate with protection from prevailing winds from the west and north; 3) rich and long flowering flora; 4) investigations from previous years had shown large and stable numbers of Syrphids in the area.

METHODS

The biotope was visited everyday in the period stated. Bad weather made work impossible on six of the days but, with the method used, short breaks in the marking had little influence on the population estimates.

Individuals of the two species concerned, *Helophilus hybridus* and *Sericomyia silentis,* were captured singly with a net. A quick-drying plastic glue, containing acetone, with dry paint pigment added, was used for marking.

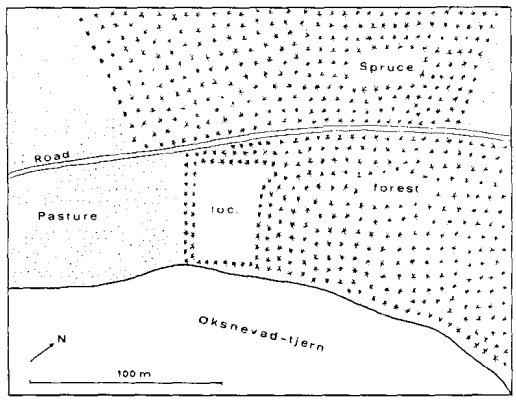

Fig. 1. The locality for the population studies, Öksnevad in Klepp.

The adhesive ability of the glue was high and in no instance was it seen to be worn or chipped, even on the oldest recaptures. Twelve different colours were applied and a combination of colour and mark-position on the thorax or abdomen indicated the date. The colour was applied with a fine needle, an instrument which made it possible to place the mark on the spot desired, thus minimizing the risk of getting unwanted spots on the struggling insects. On recapture on the following days the insects were given a new date-mark.

The method requires the fulfilment of five conditions. 1) The colour marking must be clear and specific for each date as described above. 2) The population must be well isolated from other populations of the same species and immigration and emigration must occur only to an insignificant degree. Both the spruce forest 'barrier' and the habit of both species of staying near the ground, mostly in the lower vegetation, contributed to keeping the populations within the biotope. A search was made for the species both in the forest and in the pasture near the biotope without any individuals being observed; no individuals were seen along the shore of the lake or flying out over it. When released after marking the insects all flew only short distances and then settled in the vegetation of the forest clearing. 3) The method also requires random collection within the investigated area. In this way an even distribution of the marks throughout a population is secured as far as possible. 4) The marked individuals must randomize

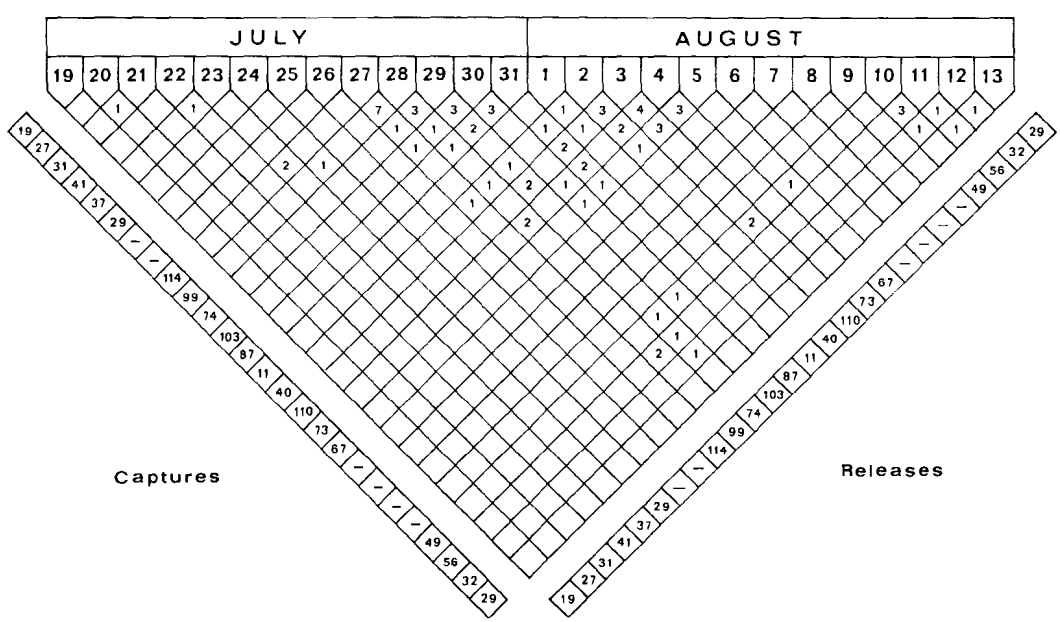

Fig. 2. Capture-recapture data from a population of *Helophilus hybridus* Loew, Öksnevad, Klepp 1965.

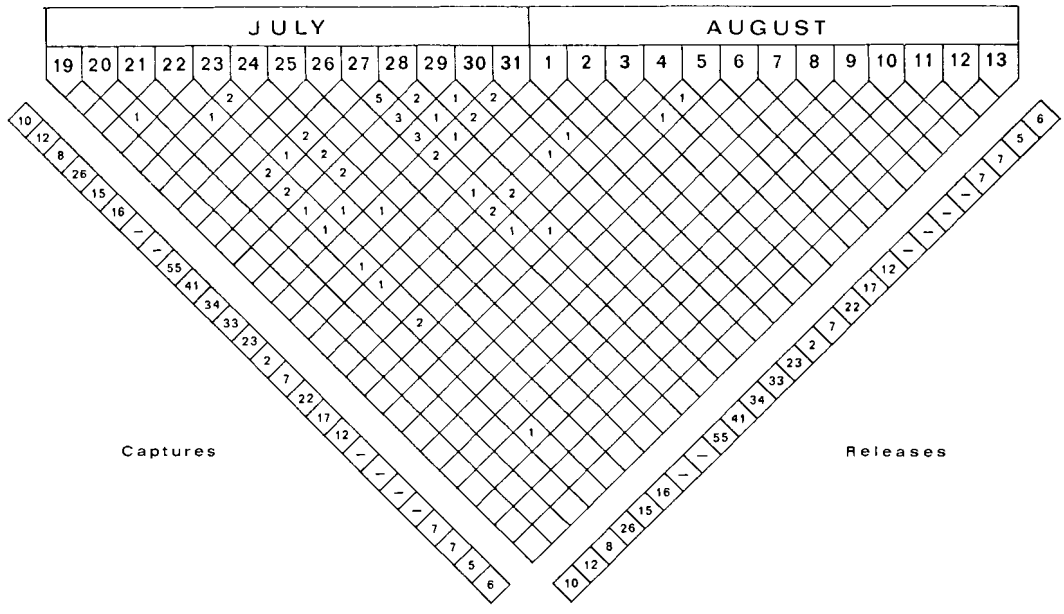

Fig. 3. Capture-recapture data from a population of *Sericomyia silentis* (Harris), Öksnevad, Klepp 1965.

readily when released. Tests made showed an effective mixing of the insects. 5) Finally the populations being investigated must not be subject to rapid fluctuations in number of individuals from day to day. Previous studies and repeated visits to the area in the same period the year before showed that this was not the case.

For statistical analysis the marking and recapture data achieved are presented in a *trellis diagram* (Fig. 2-3). The dates on which the samples were taken are given in the horizontal row, at the top of the diagram. From each date a column runs, at an angle of 45 degrees, down towards each side of the diagram. These columns (prolonged out from the sides) end in figures which on the left give the number of individuals of the species captured on each date *(captures)*, and on the right show the number of individuals released after marking on each date *(releases)*. The numbers for the captured and released individuals are of course the same except when individuals are damaged during capture or marking and have to be killed. The recaptures are given in the body of the diagram. A dash (-) in the diagram indicates that, owing to unfavourable weather conditions, no captures or releases occurred on the date concerned.

Further details for analysis and calculation are explained by Dowdeswell, Fisher & Ford (1940), Dowdeswell (1959) and Parr (1965).

RESULTS

The captures, releases and recaptures made are given in the trellis diagrams (Figs. 2 and 3). The average daily survival rate was calculated to 0.705 (70.50 per cent) in *H. hybridus* and 0.901 (90.10 per cent) in *S. silentis*.

Estimates of the daily population size of *H. hybridus* are given in Table I, showing a fluctuation between 403 individuals as a minimum and 3,121 as a maximum. The *average* daily population size was estimated to 1,569 individuals, which probably also represents the population size on days when capture and marking were not undertaken. In the period of investigation the populations were estimated to be at their largest at the end of July.

As the captures reflect, *S. silentis* was far less abundant in the area than *H. hybridus*.

Table I. Estimated daily populations of *Helophilus hybridus* in July/August 1965, Öksnesvad, Klepp (dates on which estimates of populations have not been possible, owing to lack of recaptures, are omitted)

Date	Numbers	Date	Numbers
July 21	754	Aug. 2	1120
23	2035	3	1744
27	1782	4	1109
28	1263	5	1260
29	2597	10	403
30	3121	11	593
31	2611	12	899
		13	1189

Estimates of the daily populations are given in Table II. As will be seen the species varied in number between 290 and 827 individuals. The average daily population size was estimated at 572 individuals.

The daily populations for both species are given graphically in Fig. 4.

The total number of individuals which have flown in the biotope during the period of investigation may be estimated in the following way.

H. hybridus, sum of estimated daily populations: average population size 1,569 × 26 days = 40,804 individuals. Elimination rate (survival rate = 0.705): 0.295. Estimated total number of individuals which have flown in the biotope: 40,804 × 0.295 = 12,037 individuals.

The estimated total number of individuals for *S. silentis* is 1,473. The values suggest a proportion between *H. hybridus* and *S. silentis* of 8 : 1.

The area investigated is 1200 sq m. The average and maximum individual density for *H. hybridus* was thus 1.31/m² and 2.60/m² respectively. The corresponding values for *S. silentis* were 0.48/m² and 0.69/m².

The average longevity (L) may be estimated from the expression

$$\hat{L} = \frac{1}{1 - p}$$

were p is the average survival rate. It was calculated to be 3.4 days for *H. hybridus* and 10.1 days for *S. silentis*. The longest interval of time between marking and recapture for *H. hybridus* was 14 days (Fig. 2) and for *S. silentis* 19 days (Fig. 3).

DISCUSSION

Due to difficulties in checking the results, it is not easy to estimate the reliability of the values for the populations concerned. The marking and recapture methods which have been tested on several insect groups (Odonata, Coleoptera, Lepidoptera and others) nevertheless seem to give a good picture of populations. Since however some part of the populations (at any rate newly hatched individuals) stays in the vegetation and is difficult to register, it is probable that in many cases the daily populations are larger than the marking results indicate.

It is also difficult to say why the estimated populations vary so much from day to day. The reasons possibly lie in errors inherent in the method of calculation, but they may also be connected with the material utilized. For instance the figures of daily recaptures are a decisive factor and, with their variable and low numbers, fluctuations in the results may easily occur. The noticeable population peak of *H. hybridus* and the evenly increasing numbers of individuals throughout the period for *S. silentis* seem, however, to be natural.

It is apparent (Fig. 4) that *H. hybridus* oc-

Table II. Estimated daily populations of *Sericomya* in July/August 1965, Öksnevad, Klepp (dates on which estimates of populations have not been possible, owing to lack of recaptures, are omitted)

Date	Numbers	Date	Numbers
July 22	631	Aug. 1	325
24	290	2	519
27	566	3	513
28	437	4	827
30	668	5	587
31	453	10	660

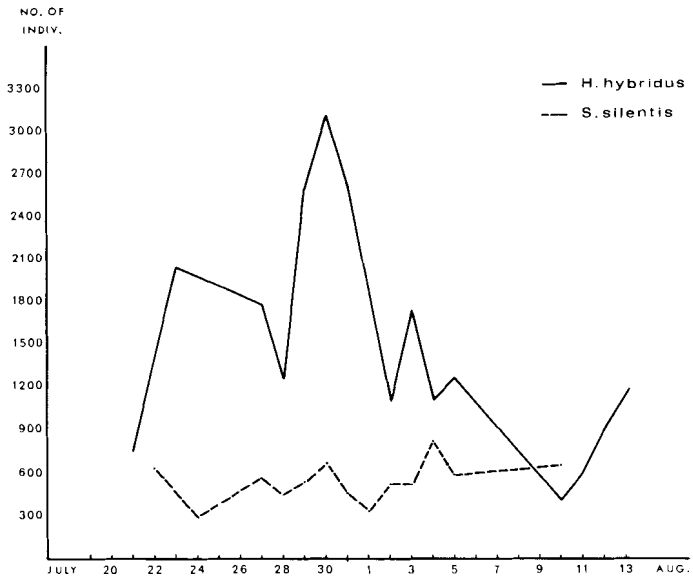

Fig. 4. Daily population size of *Helophilus hybridus* Loew and *Sericomyia silentis* (Harris) in July/August 1965, Öksnevad, Klepp.

curred more abundantly in the area investigated than *S. silentis*. The populations fluctuate rather differently, however, for the two species. The marking results indicate that the first species had a marked rise in number of individuals in the period around 20-30 July, culminating around the turn of the month, and a marked fall at the beginning of August. The *S. silentis* populations seem to fluctuate far less and showed a comparatively even increase throughout the period.

The results reached agree well with observations of the two species made in the previous year. *H. hybridus* has been highly abundant most of the summer (as early as from the middle of June) but individuals have been particularly plentiful in the last half of July. The observations also confirm the estimated falling number of individuals in August; the apparent increase in population size on 11-13 August (Fig. 4) may possibly be due to rather low values on 10 and 11 August. *S. silentis* was scarce during the first part of summer, but became gradually more frequent in the course of July and August when the populations seemed to reach a maximum.

The estimated average death rate was found to be highest for *H. hybridus* (0.295), and rather lower for *S. silentis* (0.099). Correspondingly, the average longevity ($\hat{L}$) was found to be lower in the first species (3.4 days) and higher (10.1 days) in the second. With possible reasons for this in mind, including predation, it may be of interest to compare e.g. the behaviour and flying ability of the two species. *H. hybridus* is a smaller and weaker species than *S. silentis;* it does not fly so well or so quickly. Sometimes it also seems to react less spontaneously to danger and it often remains lower in the terrain than *S. silentis*. These circumstances suggest a possible larger predation on *H. hybridus* than on *S. silentis*, and thus they may contribute to a lower survival rate and average longevity.

A weakness in Fisher and Ford's method is that the survival rate is calculated at a fixed value for the whole period of investigation. It is reasonable, however, to suppose that both the process of aging and environmental factors may lead to variation in the survival rate.

In the present investigation each species was marked and analyzed as a whole ignoring the difference in sex. If separate analyses had been carried out for each sex, a variation in the survival rate of the sexes would probably

have been revealed. In most of the Syrphids the male is a more rapid and proficient flyer than the female and is therefore presumably less exposed to predators. The females are probably more vulnerable in several ways, perhaps especially in connection with the oviposition period.

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REFERENCES

Dowdeswell, W. H., Fisher, R. A. & Ford, E. B. 1940. The quantitative study of populations in the Lepidoptera. 1. *Polyommatus icarus* Rott. *Ann. Eugen. 10,* 123-136.

Dowdeswell, W. H. 1959. *Practical animal ecology.* Methuen and Co. Ltd., Lond. 320 pp.

Parr, M. J. 1965. A population study of Ischnura elegans at Dale, Pembrokeshire. *Fld. Stud.* 2 (1), 238-281.

Dilta sp. (Thysanura) in Norway

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Hågvar, S. 1969. *Dilta* sp. (Thysanura) in Norway. *Norsk ent. Tidsskr. 16,* 39-40.

Dilta sp., probably *Dilta hibernica* Carp., has been found at six localities around the Hardangerfjord, and at four localities around the Oslofjord.

In recent years, a species of Thysanura has been found in Norway, which does not seem to have been published previously from this country. The species belongs to the genus *Dilta* Strand, of which only one species has been found in Sweden, *Dilta hibernica* Carpenter (Landin 1967). The species can be identified accurately only by the males (Delany 1954), which are extremely rare. It is believed, therefore, that the species reproduces parthenogenetically (Agrell 1944).

Most probably the Norwegian species is also *Dilta hibernica,* which is distributed in Sweden northward to the middle of the country.

Fig. 1 shows the presently known distribution of *Dilta* sp. in Norway. Detailed descriptions of the localities are given below.

Akershus: Valler, Bærum, 8 May 1965. One specimen on stone, on dry hill in mixed forest. The following findings under stone, on dry hill in mixed forest: 2 specimens 27 May 1966, 2 specimens 10 April 1967, 5 specimens 29 April 1967, 3 specimens 10 August 1968 (leg. S. Hågvar). Bygdöy, Oslo. 28 April 1968. Four specimens under stone and among litter in a hill with mixed forest (leg. E. Börset).

Östfold: Åven, Råde, 7 June 1967. 1 specimen under stone, scattered deciduous forest, 10 m from sea-shore, (leg. S. Hågvar).

Telemark: Bergsbygda, Porsgrunn, 2 June 1968. 34 specimens among old oak leaves on moist earth and on bare rocks, 20-30 m from sea-shore (leg. F. Chr. Tandberg).

Hordaland: Ånuglo, Tysnes, 6 June 1964, June 1965, 26 May 1968 (leg. H. Kauri). Storsöy, Tysnes, 1 October 1965 (leg. B. Kvamme). Varaldsöy, Kvinnherad, 5 June 1966 and 6 June 1967 (excursion). Knarrevikheiane, Fjell, 6 June 1967 (excursion). Hjölmodalen, Eidfjord, 10 July 1967, 350 m above sea level

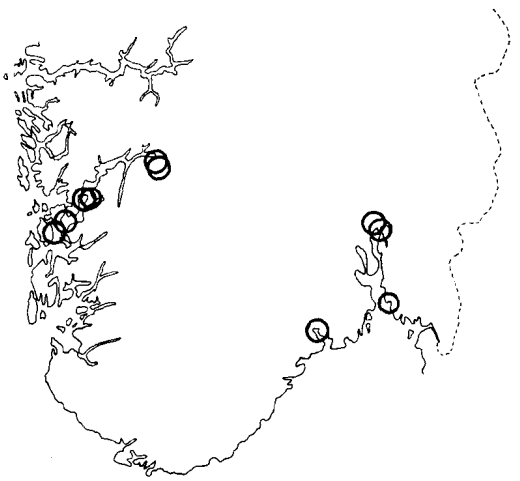

Fig. 1. Map of Southern Norway showing the presently known distribution of *Dilta*-sp. in this country.

(leg. K. Björklund). 11 July 1967, 350 m above sea level (leg. T. Nielsen). Måbödalen at Tveito, Eidfjord, 27 July 1967, 150 m above sea level (leg. A. Löken).

If we accept the imported, thermophile species *Thermobia domestica* Packard as a Norwegian species (Lillehammer 1964), we now have four species of Thysanura in Norway. Of these only *Petrobius brevistylis* Carpenter and *Dilta* sp. are free-living, while *Thermobia domestica* and *Lepisma saccharina* L. only occur inside houses. The genus *Dilta* is easily distinguished from the other free-living genus *Petrobius* by the antennae which are much shorter than the body (Fig. 2).

Fig. 2. The genus *Dilta* is easily distinguished from the other free-living Norwegian genus *Petrobius* by the antennae, which are much shorter than the body.

In Sweden, a third free-living species has been found, *Petrobius lohmanderi* Agrell. This one, like *Petrobius brevistylis,* is restricted to marine shores. But it is only distributed along the eastern Swedish coast, and it will therefore probably not be found in Norway.

The Norwegian *Dilta* has been found under different conditions. It occurs both under stones and among litter, as well as free on stones or on bare rocks. The habitat may be dry or humid. As the ground fauna in Norway has only been studied a little, further investigations will undoubtedly reveal many new localities for this Thysanura.

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REFERENCES

Agrell, I. 1944. Die schwedischen Thysanuren. *Opusc. ent. 9,* 23-36.

Delany, M. J. 1954. Thysanura and Diplura. *Handbk. Ident. Br. Insects I,* 2.

Landin, B.-O. 1967. Fältfauna, Insekter I. *Natur och Kultur.* Stockholm. 394 pp.

Lillehammer, A. 1964. Funn av Thermobia domestica Pack. i Norge (Thysanura). *Norsk ent. Tidsskr. 12,* 340-341.

Records of Coleoptera from the Finse Area

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Östbye, E. 1969. Records of Coleoptera from the Finse Area. *Norsk ent. Tidsskr. 16*, 41-43.

This article presents a preliminary account of Coleoptera collected in the Finse area from 1961 to 1968. Finse is located in the alpine region in the northwestern part of the mountain plateau, Hardangervidda, in Southern Norway (60°36′N—7°30′E Greenwich). Seventy-four species were recorded at altitudes from 1200 to 1870 m above sea level.

The insect fauna of Norwegian mountains has been poorly investigated. The purpose of the present study is to give a general account of Coleoptera collected in the Finse area from 1961 to 1968. In later works the fauna within the various types of vegetation will be discussed.

DESCRIPTION OF THE AREA

The Finse area is situated in the NW part of Hardangervidda (60° 36′ N — 7° 30′ E Greenwich), and includes the highest parts of this mountain plateau. The entire area is situated in the alpine region. The investigated area is subdivided into the following categories:

A. Finsefetene, located approximately 1 km east of Finse Lake, at an altitude of 1200 m above sea level, is a large sedimentation flat bordering the Finse River. The vegetation is dominated by several species of sedges and willows. This site includes several isolated ponds which are surrounded by 'floating' bog-like mats of moss.

B. Various localities, with continuous plant cover ranging in altitude from 1210 to 1450 m above sea level, including the valley floor and adjacent mountain slopes. The collection sites encompass grassy meadows, willow thickets, patches of heath, and large beds of lichens and mosses.

C. Glacial moraines with poorly developed vegetation (pioneer plant communities), ranging from about 1300 to 1700 m above sea level. These localities border glacier and/or large snow fields.

D. The surface of glaciers, in particular the Hardangerjökulen, and large snow fields situated at altitudes varying from 1300 to 1870 m above sea level.

Table I. Records of Coleoptera collected in the Finse area

A. Finsefetene, a large sedimentation flat.

B. Various plant communities from the mountain slopes to the valley floor.

C. The borders of glaciers and large snowfields.

D. The surfaces of glaciers and large snowfields. Species found here carried by wind or active flight are marked (×).

Species new to HOi (inner part of Hordaland county) are marked by an asterisk (*).

	A	B	C	D
Fam Carabidae				
Carabus violaceus L.		×		
Nebria gyllenhali Schnh.	×	×	×	×
N. nivalis Payk.			×	×
Pelophila borealis Payk.*	×			
Notiophilus aquaticus L.	×	×	×	
N. biguttatus F. larvae		×		
Bembidion fellmani Mnh.*		×	×	×
Patrobus assimilis Chd.	×	×		
P. septentrionis Dej.	×	×	×	×
Amara alpina Payk.	×	×	×	×
A. pratermissa Sahlb.*		×		
A. quenseli Schnh.	×	×	×	
Calathus melanocephalus L.		×		
Cymindis vaporariorum L.*		×		
Fam. Haliplidae				
Haliplus fulvus F.		×		
Fam. Dytiscidae				
Hydroporus arcticus Th.*	×	×	×	
H. melanarius Sturm*	×	×		
H. melanocephalus Mrsh.	×			
H. palustris L.	×	×	×	
H. tartaricus Lec.*	×	×	×	
Deronectes multilineatus Flkstr.	×	×	×	
Agabus congener Thbg.	×	×	×	
A. guttatus Payk.		×		
A. solieri Aubé	×	×		
Ilybius angustior Gyll.	×			
Rantus suturellus Harr.	×			
Colymbetes dolabratus Payk.	×	×		
Fam. Hydrophilidae				
Helophorus glacialis Villa		×	×	(×)
Fam. Silphidae				
Thanatophilus lapponicus Hbst.	×			
Catops tristis Panz.*		×		

Continued

Table I continued

	A	B	C	D
Fam. Liodidae				
Hydnobius spinipes Gyll.*		×		
Agathidium arcticum Th.*		×		
Fam. Staphylinidae				
Omalium caesum Gr.		×		(×)
Cylletron nivale Th.	×	×		
Olophrum boreale Payk.	×	×		(×)
O. consimile Gyll.				(×)
Arpedium brachypterum Gr.	×	×		(×)
A. tenue Lec.*	×	×		(×)
A. quadrum Gr.	×	×	×	(×)
Acidota crenata F.	×		×	(×)
A. quadrata Zett.*	×			
Lesteva monticola Kies.		×		(×)
Geodromicus longipes Mnh.	×	×	×	(×)
Anthophagus alpinus F.		×	×	(×)
A. omalinus Zett.		×		
Boreaphilus henningianus Sahlb.	×		×	
Othius melanocephalus Gr.	×			
Mycetoporus maerkeli Kr.*		×		
Tachinus elongatus Gyll.				(×)
Gnypeta brincki Brd.i.l.*	×			
Atheta arctica Th.	×			
A. alpestris Heer.		×		(×)
A. graminicola Gr.		×		
A. laevicauda J. Sahlb.		×		(×)
Oxypoda annularis Mnh.		×		
O. funebris Kr.*	×	×		
Fam. Cantharidae				
Rhagonycha limbata Th.	×			
Fam. Elateridae				
Hypnoidus riparius		×		
Fam. Byrrhidae				
Simplocaria metallica Sturm.*	×			
S. semistriata F.		×		
Byrrhus arietinus Steff.*	×			
B. fasciatus Forst.	×	×	×	
B. pilula L.		×		(×)
Syncalypta cyclolepidia Munst.*	×			
Fam. Coccinellidae				
Coccinella septempunctata L.	×	×		(×)
Anatis ocellata L.	×	×		(×)
Fam. Scarabaeidae				
Aphodius lapponum Gyll.	×	×	×	(×)
A. piceus Gyll.				(×)
Fam. Cerambycidae				
Callidium violaceum L.		×		

Continued

Table I continued

	A	B	C	D
Fam. Chrysomelidae				
Melasoma collaris L.*	×	×		(×)
Fam. Curculionidae				
Otiorrhynchus dubius Ström.	×	×	×	
Grypus equiseti F.*	×			
Lepyrus arcticus Payk.	×			
Rhynchaenus flagellum I.B. Erics.*		×		

MATERIAL

The majority of the material was collected by the author in his investigations during the 1961-1968 period. The remainder of the material was collected during high altitude ecology courses given by the University of Oslo in August of the years 1962-1967. Most of the material was taken in pitfall traps placed in the different biotopes, but part of it was collected by hand.

Most of the species have been identified by Dr. phil.h.c. Andreas Strand, and some of them by Cand. real. Johan Andersen. Table I gives a list of species that, to date, have been found at the Finse area.

It appears that the Coleoptera fauna in the Finse area is relatively poor. So far only 74 species have been registered, but further collections may result in additional species. Taking into consideration the long collecting period, it seems likely that most of the species within the area have been found. According to Lindroth (1960), twenty-one of the species collected have not been previously recorded from HOi (inner part of Hordaland county (Strand 1943)).

Most of the insects must be characterized as typical alpine species. Others, that are less typical for the alpine region, are characteristic for biotopes bordering these high altitudes. Some of the species have probably arrived at the area by active flight, or have been transported by air currents. It is suspected that most of the species found on glaciers were carried there by winds.

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I would like to thank Dr. phil.h.c. Andreas Strand and Cand. real. Johan Andersen for help with identification of most of the species. The field work was supported by grants from Collets legat and from NAVF.

REFERENCES

Lindroth, C. H. (Ed.) 1960. *Catalogus coleopterorum Fennoscandiae et Daniae.* Entomologiska sällskapet i Lund. 476 pp.

Strand, A. 1943. Inndeling av Norge til bruk ved faunistiske oppgaver. *Norsk ent. Tidsskr. 6*, 208-224.

Cold-Hardiness in Some Winter Active Insects

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Sömme, L. & Östbye, E. 1969. Cold-hardiness in some winter active insects. *Norsk ent. Tidsskr. 16*, 45-48.

Observations during the last ten years showed that imagines of *Boreus hyemalis* (Hag.) and *Boreus westwoodi* (L.) are active on snow from September to April at temperatures around 0° C. Imagines of *Chionea araneoides* Dalm. and *Scoliocentra*-sp. were more common between −4° and 0° C. Comparison of the chill-coma temperatures and haemolymph freezing points in the laboratory showed that *Boreus*-spp. and *C. araneoides* may be active in a supercooled state. This also applies to *Biorrhiza pallida* Ol. With the exception of *B. westwoodi*, which was active until it froze, supercooling points were lower than the chill-coma temperatures. All species were killed by freezing at temperatures corresponding to their supercooling point. Glycerol was found only in *B. pallida*.

Insects that are active on snow during the winter offer one of the most unusual cases of insect life at low temperatures. The appearance of various winter active insects has been observed by a number of authors and some of the literature reviewed by Strübing (1958). Observations from Scandinavia have been reported by Svensson (1966), who found active specimens of *Chionea*-sp. and *Scoliocentra nigrinervis* Wahlgr. at temperatures down to −8° and −6°C. *Boreus*-spp. were observed down to 0°C, or slightly lower. Fjellberg & Greve (1968) observed active *Boreus*-spp. at temperatures just above 0°C.

Although data on chill-coma temperatures are available for several winter active insects (Strübing 1958), several aspects of their cold-hardiness have not been adequately studied. Thus it is of interest to know if these species may survive freezing, or to what extent they depend on supercooling to avoid lethal, freezing temperatures. Furthermore, haemolymph freezing points should be measured for comparison with chill-coma temperatures. Activity of animals in a supercooled state has been reported from some arctic fishes (Scholander et. al. 1957, Gordon et. al. 1962), but not from insects.

The present study includes additional field observations on winter active insects at various temperatures. Studies on freezing tolerance, chill-coma temperatures, supercooling points, and haemolymph freezing points were carried out under laboratory conditions. The field observations include records of *Boreus hyemalis* (Hag.), *Boreus westwoodi* (L.) (Mecoptera), *Chionea araneoides* Dalm. (Diptera, Tipulidae) and *Scoliocentra*-sp. (Diptera, Helomyzidae). The first three species are all wingless. In addition *Scoliocentra nigrinervis* Wahlgr. and the

wingless form of *Biorrhiza pallida* Ol. (Hymenoptera, Cynipidae) were included in the laboratory experiments.

FIELD OBSERVATIONS

Numerous field observations were made in Southern Norway during the last ten years. Details of distribution and dates of collection will be given in a later publication by E. Östbye. Because they are pertinent to the discussion of our laboratory experiments, some of the most important data are included here.

Imagines of *C. araneoides, B. hyemalis* and *B. westwoodi* were usually found active on snow from early September to the end of April. Only a few specimens were recorded from periods without snow, but the appearance of these species may easily be overlooked under such conditions. While *B. hyemalis* and *B. westwoodi* were most frequently recorded at temperatures around 0°C (−1° to +2°), *C. araneoides* was more common at temperatures from −4° to 0°C. These temperatures refer to measurements taken 5 to 10 mm above the snow surface with a shaded-bulb mercury thermometer. *Boreus*-spp. were usually not found on the snow surface at temperatures below −3° to −2°C, while *C. araneoides* was found at temperatures down to −7° and −6°C. *Scoliocentra*-sp. appeared to be active in the same temperature range as *C. araneoides*.

At suitable temperatures the various species showed a uniform activity throughout the light part of the day. The most frequent occurrences of winter active insects on snow were found on cloudy days, shortly after snowfalls.

LABORATORY EXPERIMENTS

Material and methods

C. araneoides and *S. nigrinervis* were collected in early February 1967 at Kongsberg, Buskerud. The temperature 5 mm above the snow surface varied from −4.6° to −2.0°C. The specimens were stored at 0°, and used for experiments the following day. *B. hyemalis, B. westwoodi,* and *B. pallida* were collected by stud. real. Arne Fjellberg in the last part of December 1968 at Tjöme, Vestfold. The air temperature on the day of collection was between 0° and 2°C. The specimens were stored on moss at temperatures from 2° to 10°C for nine days before use.

Chill-coma temperatures were measured by a thermometer in a 100 ml Erlenmeyer flask, in which the insects were placed. The flask was suspended in a beaker, which was lowered into a bath of alcohol and dry ice. In the range where chill-coma temperatures were observed, the temperature in the flask decreased at the rate of 1°C in five to fifteen min. The temperature at which all movements ceased was taken as the chill-coma temperature. A slightly different technique was used for the single specimen of *C. araneoides,* with a decrease of 1°C in 2.5 min.

The temperatures at which the insects froze (the supercooling points) at a cooling rate of 1° to 2°C per min, were measured with a copper-constantan thermocouple in contact with the outer surface of the insect (Sömme 1964). The thermocouple was connected to a recording potentiometer, from which the supercooling points were read.

Small drops of haemolymph for determination of freezing points were obtained from *Boreus*-spp. by cutting off one of the legs. Haemolymph from *C. araneoides* and *B. pallida* were taken from a small cut in the dorsal side of the first abdominal segment. Attempts to obtain clear samples of haemolymph from *S. nigrinervis* were not successful. The haemolymph samples were placed in capillary tubes, which were sealed at both ends with Vaseline, and frozen. The freezing points were defined as the temperature at which the last ice crystals disappeared, when the frozen samples were slowly heated (Salt 1956).

Samples for glycerol analysis were prepared from whole insects (Sömme 1964), and paper chromatograms of the extracts developed according to Metzenburg and Mitchell (1954).

Table I. Chill-coma temperatures, supercooling points and haemolymph freezing points in five species of winter active insects

Species	Chill-coma °C			S.c.pt. °C			Fr.pt. °C		
	n	mean	range	n	mean	range	n	mean	range
Boreus hyemalis	10	−4.1	−5.5/−3.0	8	− 5.7	− 6.5/− 5.0	6	−0.55	−0.68/−0.47
Boreus westwoodi	9	−5.5	−6.5/−4.0	8	− 5.6	− 6.5/− 5.0	6	−0.69	−0.81/−0.62
Chionea araneoides	1	−5.5		11	− 7.5	−10.5/− 4.5	8	−0.71	−1.00/−0.42
Biorrhiza pallida	10	−2.3	−4.0/+1.0	10	−11.5	−20.0/− 7.0	7	−1.75	−2.05/−1.25
Scoliocentra nigrinervis				6	−16.3	−20.5/−13.0			

RESULTS

In four of the species the haemolymph freezing points were higher than the chill-coma temperatures (Table I). This clearly shows that these insects are capable of active movements in a supercooled state. Freezing points of haemolymph from *Boreus*-spp. and *C. araneoides* were in the range usually found in insects, while those of *B. pallida* were lower. The difference is caused by the large content of glycerol in the last species. While none of the first three species contained detectable traces, the content of glycerol in *B. pallida* corresponded to an average of 1.7 percent (range 1.3 to 2.1) of their body weight.

In *B. hyemalis* and *B. pallida* chill-coma appeared before the insects froze, while chill-coma temperatures and supercooling points were almost identical in *B. westwoodi*. In our experiments specimens of the latter insects thus were active until they froze.

Emphasis was placed on determining whether or not the various species are able to survive ice formation in their tissues. When freezing occurs at the supercooling point the inner temperature is raised, followed by a decrease caused by the surrounding lower temperatures. These changes were recorded on the potentiometer. In the present experiments the insects were removed from the apparatus when the temperature reached the supercooling point for the second time. In no cases did any specimen of the five species show signs of recovery after this treatment, even after one or two hrs at room temperature. It is concluded that none of the winter active species investigated can survive freezing.

DISCUSSION

Since chill-coma temperatures and supercooling points were almost identical in *B. westwoodi*, specimens of this species were actually active until they froze. None recovered after being removed from the chill-coma apparatus. Contrary to our results, Strübing (1958) found that this species may be active at temperatures down to —13° C. Although her fiugres seem rather low, it is possible that the chill-coma temperatures found in our experiments would have been lower if the supercooling points were lower. As pointed out by Salt (1966, 1967) feeding stages of insects usually have less ability to supercool than non-feeding stages. This difference is caused by the content of foreign nucleating agents in the gut of feeding insects. Starvation of *B. westwoodi* for 4 days at 6°C did not change our results, although it seems likely that further attempts to empty the gut may have resulted in lowered supercooling points. Since the insects probably feed during the winter, our results will correspond to the situation under natural conditions.

In the other species chill-coma temperatures were higher than the supercooling points, indicating that the 'true' chill-coma temperatures were recorded. Our figures for chill-coma in *B. hyemalis* correspond to those given by Strübing (1958), who also mentions that —7°C is a lethal temperature for this species.

It is generally known that the snow-cover offers very good insulation against low temperatures. Temperatures in the subnival air space are usually near, or even some degrees above 0° C (Coulianos & Johnels 1962). Ob-

servations by the authors show that high temperatures in particular may be found in moist places with moss vegetation.

With supercooling points of about −5.5°C it appears that *Boreus*-spp. have a very narrow temperature range in which they may survive during winter conditions. It seems to be of vital importance for these insects to seek protection under the snow cover as soon as freezing temperatures set in. This assumption is completely in agreement with field observations. Local subnival temperatures may be a limit for the distribution if the ground surface is cooled below −5° to −6° C.

Temperatures in this range may not be critical for *C. araneoides* and *S. nigrinervis*, which have lower supercooling points. That these two species are active on snow at lower temperatures than *Boreus*-spp., agrees with the experiments of Wojtusiak (1950), who found that *Boreus*-sp. preferred temperatures around 0° C, and *Chionea*-sp. around −3.5° C. Similarly, Chapman (1954) found that North American *Chionea*-spp. were active on snow at lower temperatures than *Boreus*-spp.

In a supercooled state winter active insects are constantly exposed to the risk of spontaneous freezing. Freezing by inoculation may also occur during contact with ice and snow, unless the cuticula of the species offers special protection against inoculation. Furthermore, movements in themselves may in some instances promote spontaneous freezing. No doubt, winter active insects balance on the edge of their survival limits.

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We are most grateful to stud. real. Arne Fjellberg, who supplied us with material, and also identified specimens of *Boreus*-spp. and *B. pallida*. Fil. lic. Sven Svensson has kindly identified specimens of *S. nigrinervis* used in the laboratory experiments.

REFERENCES

Chapman, J. A. 1954. Observations on snow insects in western Montana. *Can. Ent. 86*, 357-363.

Coulianos, C.-C. & Johnels, A. G. 1962. Note on the subnivean environment of small mammals. *Ark. Zool.* Ser. 2, 15, 363-370.

Fjellberg, A. & Greve, L. 1968. Notes on the genus Boreus in Norway. *Norsk ent. Tidsskr. 15*, 33-34.

Gordon, M. S., Amdur, B. H. & Scholander, P. F. 1962. Freezing resistance in some northern fishes. *Biol. Bull. mar. biol. lab. Wood's Hole 122*, 52-62.

Metzenburg, R. L. & Mitchell, H. K. 1954. Detection of periodateoxidizable compounds on paper chromatograms. *J. Am. Chem. Soc. 76*, 4187.

Salt, R. W. 1956. Freezing and melting points of insect tissues. *Can. J. Zool. 34*, 1-5.

Salt, R. W. 1966. Factors influencing nucleation in supercooled insects. *Can. J. Zool. 44*, 117-133.

Salt, R. W. 1967. Location and quantitative aspects of ice nucleators in insects. *Can. J. Zool. 46*, 329-333.

Scholander, P. F., van Dam, L., Kanwisher, J. W., Hammel, H. T. & Gordon, M. S. 1957. Supercooling and osmoregulation in arctic fishes. *J. cell. comp. Physiol. 49*, 5-24.

Sömme, L. 1964. Effects of glycerol on cold-hardiness in insects. *Can. J. Zool. 42*, 87-101.

Strübing, H. 1958. *Schneeinsekten*. A. Ziemsen Verlag, Wittenberg Lutherstadt. 47 pp.

Svensson, S. 1966. Studier över vissa vinteraktiva insekters biologi. *Norsk ent. Tidsskr. 13*, 335-338.

Wojtusiak, H. 1950. The temperature perferendum of winter insects of the genus Boreus (Panorpatae) and Chionea (Diptera). *Bull. Ac. Pol. Sci. Lettr.*, Ser. B, 11, 125-143.

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Description of a New Subgenus, *Flachiana*, and Four New Species of the Genus *Acrotrichis* Motschulsky, 1848 (Col., Ptiliidae)

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Sundt, E. 1969. Description of a New Subgenus, *Flachiana,* and Four New Species of the Genus *Acrotrichis* Motschulsky, 1848 (Col., Ptiliidae). *Norsk ent. Tidsskr. 16,* 49-53.

A new subgenus, *Flachiana,* is described. The species of the subgenus are distributed in the eastern part of the Palearctic region, as well as in the Oriental and Ethiopian regions. Four new species from Japan, *errata* n. sp., *kubotai* n. sp., *similaris* n. sp. and *yazakii* n. sp. are described. *Acrotrichis satsumanis* Yazaki, 1925 is established as a nomen dubium.

Within the holarctic *Acrotrichis* species, the aedeagus is generally of little importance. The apical part is more or less evenly rounded without specific characters and the parameres are not developed. The proportion between length and breadth may certainly vary from species to species, but on account of the shrinking of these weakly sclerotized organs too much weight must not be placed on this character.

Exceptions are the species *danica* Sundt, 1958, and *norvegica* Strand, 1941, as well as the subgenus *Ctenopteryx* Flach, 1889. In these species the aedeagus tapers more or less evenly towards the apical part. Also excepted is the *brevipennis* group (*brevipennis* Er., 1845, *dispar* Matth., 1865, and *longicornis* auct. (Sundt 1958a)) in which the apical part has teeth-, spike- or horn-shaped protuberances. With the exception of the subgenus *Ctenopteryx* the external shape of these species never tapers rearward.

From the eastern part of the Palearctic region as well as the Oriental and Ethiopian regions I have seen a group of species which differs from all those hitherto known by the build of the aedeagus. The apical part is more or less extended and the parameres generally developed. With the exception of a few species the last visible sternite in the male has an excavation which is covered on the inside by sternite 7, in the sequel mentioned as the genital plate. The excavation and the genital plate have specific characters. These species, all with a broad, domed pronotum and rearward tapering elytra belong to a new subgenus, *Flachiana* subgen. nov., described in the present paper. Some *Ctenopteryx* species may appear similar to *Flachiana* with regard to external characters, to some extent also to the shape of

the aedeagus. These species sometimes have a broad pronotum and rearward tapering elytra and the aedeagus is also as a rule forward tapering. The side edge of the pronotum, however, never has a basal arch (Sundt 1958b) and the spermatheca is always rudimentary. To avoid confusion I have therefore included the basal arch and the general build of the spermatheca as subgeneric characters in the description of *Flachiana*.

Besides the type species *kubotai* n.sp., the east Palearctic *lewisi* Matthews, 1884, *similars* n. sp., and *yazakii* n.sp. are referred to the new subgenus. Further *cursitans* Nietner, 1856, and *immatura* Nietner, 1856, both described from Ceylon, as well as 4 new species from the Ethiopian region, which Johnson (1969) will publish in a revision of the African species of the genus. With some doubt I have also included *errata* n.sp., of which I have seen only a single specimen from Japan. The aedeagus and the secondary sexual genital characters apply to the description whereas the external form does not completely agree with the characteristics of *Flachiana*. The *Acrotrichis* species are, however, extremely variable and it is not improbable that the type of *errata* diverges from normal specimens and that this species also will prove to be a *Flachiana*.

Based on the male genital characters the *Flachiana* species may be divided in the following groups:

kubotai group: *kubotai* n.sp., *similaris* n.sp. and *lewisi* Matthews, 1884.

yazakii group: *yazakii* n.sp. and *cursitans* Nietner, 1856.

errata group: *errata* n.sp. and *immatura* Nietner, 1856.

The heterogeneity of these characters may, perhaps, justify a further division of *Flachiana* into new subgenera. Because of the insufficient knowledge of the *Acrotrichis* species of the world we will at present however, be more safe in dealing with these genital types as species groups and leave it to the future to decide, on a much more extensive knowledge, whether a further division will fit into a natural taxonomic system.

In principle I do not describe new species on the basis of a single specimen, particularly not in the genus *Acrotrichis* in which the species are extremely variable. As far as *errata* n.sp. and *similaris* n.sp. are concerned I have, however, no hesitation in deviating from this principle because of the characteristic aedeagus and secondary genital characters.

DESCRIPTION OF THE SUBGENUS *FLACHIANA* SUBGEN. NOV.

Pronotum domed, broader than the elytra which are posteriorly narrowed.

Side edge of pronotum evenly curved or more strongly curved in the rear part. Last visible sternite in the male generally with specific secondary sexual characters. Aedeagus with the apical part extended. Parameres usually developed. Spermatheca not rudimentary.

Type species: *Acrotrichis kubotai* n.sp.

DESCRIPTION OF THE NEW SPECIES

Acrotrichis kubotai n.sp.

A very large (1.15 - 1.20 mm), rearwards tapering species with fine and very closely puncturated pronotum. Elytra are somewhat extended at the base. Pygidium is more narrow than in most related species, with the exception of *similaris* n.sp. (Fig. 1 A).

The head has spaced and very fine puncturation and indistinct reticulation. The 2 basal joints of the antennae are yellow-brown, 3rd-11th joints darker. The joints are the same length as normal specimens of *intermedia* Gillmeister.

Protonum evenly forward rounded, powerfully domed in the middle and flattening towards the basal corners. The first ¾ of the side edge, seen from the side, nearly straight, the rear ¼ with hinted basal arch. Fine and very close puncturation and fine, distinct reticulation.

Elytra taper rearwards with a depression on each side of the scutellum and feebly

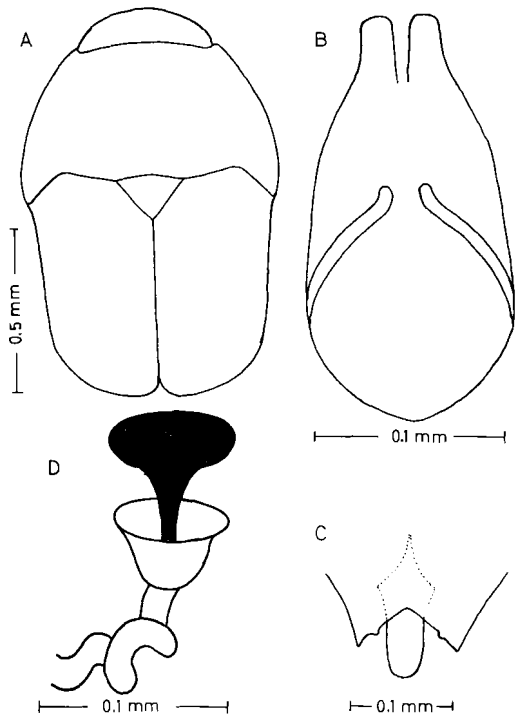

Fig. 1. *Acrotrichis kubotai* n. sp. A. general form, B. aedeagus, C. last visible sternite and genital plate (♂), D. spermatheca.

marked shoulders. Epipleura extended in front, particularily in the male.

♂: Aedeagus Fig. 1B. Last visible sternite and genital plate Fig. 1C.

♀: Spermatheca Fig. 1D.

Holotype ♂: Doryo-San near Odawara, Japan, leg. M. Kubota 14 Apr. 1942. In my collection.

Allotype ♀: Miyanoshita, Japan, leg. G. Lewis. In the collection of British Museum (Nat.Hist.), London.

Paratypes: Doryo-San near Odawara, leg. M. Kubota 14 Apr. 1942 (2); Miyagino, Hakone, Kanagawa Pref., Japan, leg. M. Kubota 11 June 1967 (12); 11 July 1967 (4); Odawara, leg. M. Kubota 17 June 1941 (2); 20 Oct. 1941 (1); 6 Nov. 1941 (1).

Paratypes are in the collections of the British Museum (Nat.Hist.), London; Field Museum of Natural History, Chicago; Mr. Colin Johnson, Manchester; Dr. Masao Kubota, Odawara, Japan, as well as in my own collection.

Acrotrichis errata n.sp.

A larger (1.0 mm), domed species. Pronotum has fine puncturation and close reticulation. The side edge is evenly rounded (Fig. 2A).

The head has clear reticulation and very weak puncturation. The two basal joints of the antennae are clear, transparent amber-yellow, 3rd-11th joints obscure and of the same length as in *fascicularis* Hb., 1793.

Pronotum is somewhat glistening with fine puncturation and reticulation. The side edge is evenly rounded.

♂: Aedeagus Fig. 2B. Last visible sternite and genitalplate Fig. 2C.

♀: From among Matthews' *lewisi* specimens in the British Museum I have seen two ♀♀ from Niigata, Japan, leg. G. Lewis, which are very similar to *errata* n.sp. The spermatheca is closely related to that of *lewisi* Matth., 1884. I feel inclined to regard these specimens as *errata* ♀♀. The specimens are, however, not col-

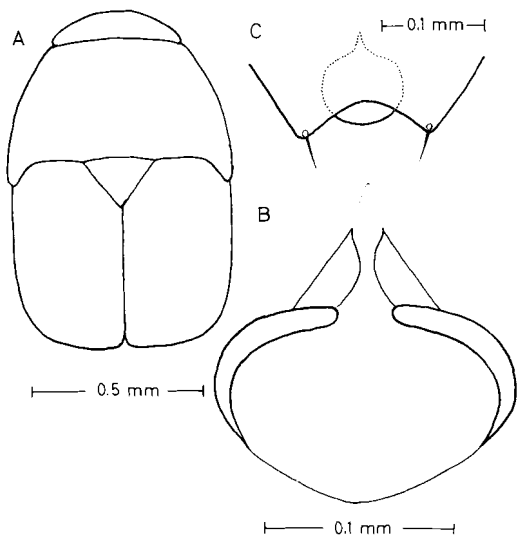

Fig. 2. *Acrotrichis errata* n. sp. A. general form, B. aedeagus, C. last visible sternite and genital plate (♂).

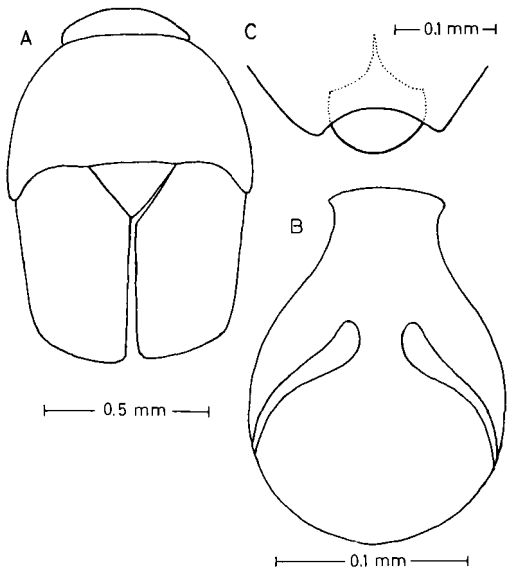

Fig. 3. *Acrotrichis similaris* n. sp. A. general form, B. aedeagus, C. last visible sternite and genital plate (♂).

lected from the same locality as the type and, to play safe, I shall provisionally regard *errata* ♀ as unknown.

Holotype ♂: Yokohama, Japan, leg.G.Lewis. In the collection of the British Museum (Nat. Hist.). I also found the type specimen of *errata* in Matthews' *lewisi* collection. The specimen had neither determination label nor number, and it is not improbable, therefore, that Matthews himself considered it a new species.

Acrotrichis similaris n.sp.

A large (1.1 mm), brownish species with domed pronotum and rearward tapering elytra (Fig. 3A).

The head is covered by insoluble adhesive and therefore I am not able to describe the reticulation and puncturation. The antennae are of medium length, 3rd-8th joint a little shorter than in normal specimens of *intermedia* Gillmeister, 1845.

Pronotum is domed with distinct reticulation and puncturation. The first ⅔ of the side edge, seen from the side, is slightly and evenly rounded, the hind ⅓ has a somewhat more marked arch.

Elytra rearward tapering with hinted shoulders.

Pygidium is rather narrow, like that of *kubotai* n.sp.

♂: Aedeagus Fig. 3B. Last visible sternite and genital plate Fig. 3C.

♀: Unknown.

Holotype ♂: Doryo-San near Odawara, Japan. Leg. M. Kubota 14 Apr. 1942. In my collection.

Acrotrichis yazakii n.sp.

A smaller (0.8 mm), dark, rearward evenly tapering species with a highly domed pronotum. Fig. 4A.

The head is more glistening than pronotum, with scarcely visible puncturation and reticulation. The antennae are dark, the two basal

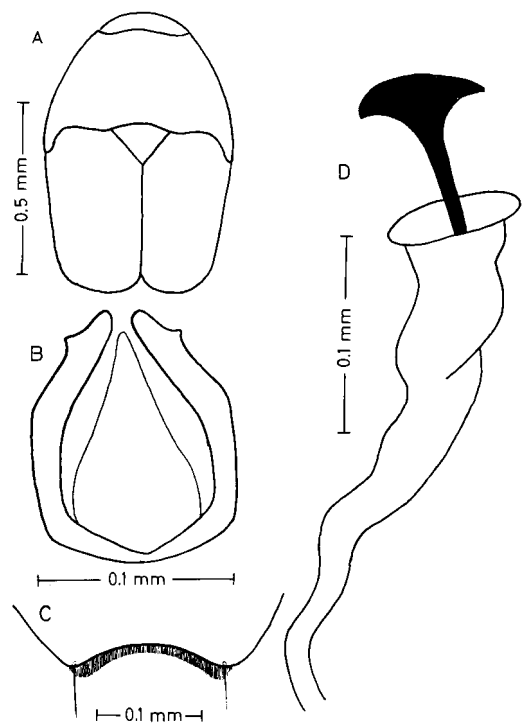

Fig. 4. *Acrotrichis yazakii* n. sp. A. general form, B. aedeagus, C. last visible sternite (♂). D. spermatheca.

joints somewhat lighter. 3rd to 8th joints shorter than by *fascicularis* Hb., 1793.

Pronotum is highly domed with fine punctuation and close reticulation which causes a silk-like tinge. The side edge evenly rounded.

Elytra rearward tapering.

Pygidium has feebly marked tooth in the middle.

♂: Aedeagus Fig. 4B. The evenly rounded excavation of the last visible sternite with a fine row of comb-shaped spikes. These spikes are, however, only visible by a rather great enlargement. By enlargement up to 100 times the spikes are visible as a darker part of the sternite (Fig. 4C).

♀: Spermatheca Fig. 4D.

Holotype ♂: Odawara, Kanagawa Pref., Japan, leg. M. Kubota 9 Sept. 1966. In my collection.

Allotype ♀: Odawara, Kanagawa Pref., Japan, leg. M. Kubota, 9 Sept. 1966. In my collection.

Paratypes: Odawara, Kanagawa Pref., Japan, leg. M. Kubota, 12 Oct. 1941 (3); 26 Oct. 1941 (1); 14 Oct. 1945 (3); 6 Nov. 1945 (1); 6 Apr. 1946 (2); 7 Apr. 1946 (2); 6 May 1946 (1); 25 July 1966 (2); 3 Sept. 1966 (46); 18 Nov. 1966 (4); Tokyo, Japan, leg. M. Kubota 2 May 1941 (1); Hachijo Is., Kaminato, Japan, leg. M. Kubota 6 Aug. 1948 (2).

Paratypes in the collections of the British Museum (Nat. Hist.), London, Field Museum of Natural History, Chicago, Mr. Colin Johnson, Manchester, Dr. Masao Kubota, Odawara, as well as in my own collection.

I suspect *yazakii* n.sp. to be the same species as *Acrotrichis satsumanis* Yazaki, 1925. Professor Yazaki's collection in the Museum of Kagoshima University is, however, completely destroyed therefore I have not been able to examine the *satsumanis* type. On account of the disproportion between the size of *yazakii* n.sp. (0.8 mm) and the size of *satsumanis* as stated in the description (0.38 mm) (Yazaki 1925) I will not maintain this species by neotype designation. *Acrotrichis satsumanis* Yazaki, 1925 must therefore be considered a nomen dubium because of incomplete description and deficient type material (Sundt 1958a).

A. yazakii is a rather common species in Japan and will probably prove to have considerable distribution. I have also seen specimens from Pokhara, Nepal, in the collection at the British Museum.

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ACKNOWLEDGEMENTS

I wish to express my gratitude towards the following institutes and individuals for their contributions in the form of material and information, or in other ways: the British Museum (Mr. J. Balfour-Brown, Miss C.M.F. von Hayek), the Institute of Zoology, Warsaw (Dr. Boleslaw Burakowski), and Mr. Colin Johnson, Manchester. I am especially indebted to Dr. Masao Kubota, Odawara, Japan, who has placed his collection at my disposal for investigation, and who has also offered invaluable help in other ways.

REFERENCES

Johnson, C. 1969. The Genus *Acrotrichis* Motschulsky (Coleoptera, Ptiliidae) in the Ethiopian Region. (Studies in Ethiopian Ptiliidae No. 2.) *Revue Zool. Bot. afr.* (In print.)

Sundt, E. 1958a. Contributions to the knowledge of the family Ptilidae (Col.) I-III. *Norsk ent. Tidsskr. 10,* 173-180.

Sundt, E. 1958b. Revision of the Fenno-Scandian species of the genus Acrotrichis Motsch., 1848. *Norsk ent. Tidsskr. 10,* 241-277.

Yazaki, M. 1925. A list of Ptiliidae of Japan with description of a new species. *Zool. Mag., Tokyo 37,* 17-26.

Über *Mycetoporus bimaculatus* Boisd.Lac. und nahestehende Arten mit Beschreibung einer neuen Art *despectus* n. sp. (Col., Staphylinidae)

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Strand, A. 1968. Über *Mycetoporus bimaculatus* Boisd. Lac. und nahestehende Arten mit Beschreibung einer neuen Art *despectus* n. sp. (Col., Staphylinidae). *Norsk ent. Tidsskr. 16,* 55-58.
Der Verfasser schliesst sich der Auffassung an, dass es sich bei *Mycetoporus ruficornis* Kr., *longulus* Mannh. und *brunneus* Marsh. um verschiedene Arten handelt und beschreibt die neue Art *despectus* n. sp. Es scheint zweifelhaft ob *bimaculatus* sensu Luze die wirkliche *bimaculatus* Boisd. Lac. ist. Der Typus dieser letzen Art scheint verloren gegangen zu sein. Nach der Auffassung u. a. des Verfassers dürfte diese Art *ruficornis* Kr. identisch sein. Auffassung u. a. des Verfassers dürfte diese Art mit *ruficornis* Kr. identisch sein.

Über die systematische Stellung von *Mycetoporus longulus* Mannh., *ruficornis* Kr. und *bimaculatus* Boisd.Lac. gehen, wie bekannt, die Meinungen weit auseinander. Hellén (1925) hält alle für Varietäten von *brunneus* Marsh. und betrachtet *bimaculatus* und *ruficornis* als identisch. In dem nordischen Katalog von 1939 (Hellén 1939) stehen *longulus* als eigene Art und *bimaculatus* und *ruficornis* als Varietäten von *brunneus,* und in der 1960 Ausgabe (Lindroth 1960) steht *bimaculatus* als Synonym von *brunneus,* während die zwei anderen als eigene Arten aufgefürt sind.

Victor Hansen (1964) hat, wie auch ich, *bimaculatus* für identisch mit *ruficornis* gehalten, während Palm (1966) *bimaculatus* überhaupt nicht erwähnt.

Neulich hat Lohse (1964) und Horion (1967) alle vier für eigene Arten erklärt, und Horion hat übrigens auf die Unklarheit in den nordischen Ländern aufmerksam gemacht.

Wärend *brunneus, longulus* und *ruficornis* keine Schwierigkeiten bereiten, ist die Frage was *bimaculatus* eigentlich ist gar nicht einfach.

A. Descarpentries und J. Jarrige haben mir mitgeteilt, dass sie im Naturhistorischen National-Museum in Paris vergebens nach dem Typus von *bimaculatus* gesucht haben, und dass er wahrscheinlich als verloren angesehen werden muss.

Die Originalbeschreibung (Boisduval & Lacordaire 1835) enthält nichts über die Mikroskulptur und die Dimensionen der Fühler, die Farbe der Fühler aber ist als gleichfärbig angegeben (»en entier d'un testacé légèrement roussâtre«).

Nach der Farbe der Fühler zu urteilen liegt es nahe *bimaculatus* als mit *ruficornis* identisch anzusehen. Auch Ganglbauer (1895) hat auf

diese Identität folgenderweise hingewiesen: «*M. longulus* und *M. bimaculatus (ruficornis* Kr.) machen den Eindruck selbständiger Arten, lassen sich aber weder durch die Färbung noch durch die Punktirung scharf auseinander halten». Infolge Luze (1901) hat ausserdem Rey *bimaculatus* als Varietät von *ruficornis* bezeichnet. Ferner haben mir Professor Fagel und J. Jarrige mitgeteilt, dass sie *bimaculatus* für mit *ruficornis* identisch halten. Neulich ist indessen Lohse (1964) in seiner Beurteilung von *bimaculatus* Luze gefolgt.

Nach Luze (1901) soll sich *bimaculatus* von *ruficornis* u. a. durch kürzere, gegen das Ende stärker verdickte, dunklere und zweifärbige Fühler mit merkbar breiteren vorletzten Gliedern und vor allem durch die Mikroskulptur unterscheiden. Die Fühler und die Mikroskulptur beschreibt er wie folgt:

ruficornis:

Fühler: Braunlichgelb oder rotgelb, mitunter in der Endhälfte ± gebräunt, drittes Glied etwas länger als das zweite, viertes Glied etwas länger als breit, die vorletzten Glieder 1½ mal so breit als lang.

Mikroskulptur: Halsschild kräftig und weitläufig, die Flügeldecken mässig fein und etwas weitläufig, das Abdomen fein und weitläufig, siebentes Segment kräftiger quer gerieft.

bimaculatus:

Fühler: Basis der braunen Fühler gelbbraun, drittes Glied fast etwas kürzer als das zweite, viertes Glied so lang als breit oder schwach quer, die vorletzten Glieder doppelt oder mehr als doppelt so breit als lang.

Mikroskulptur: Halsschild fein und ziemlich weitläufig, die Flügeldecken fein und ziemlich dicht, das Abdomen sehr fein und dicht quer gerieft.

Wegen der Fühlerfarbe kann es sich bei *bimaculatus* sensu Luze kaum um die wirkliche *bimaculatus* handeln.

Die nordischen Arten lassen sich folgenderweise auseinanderhalten:

Bestimmungstabelle der nordischen Arten der *Mycetoporus brunneus*-Gruppe.

1. Kopf mit weitläufiger Mikroskulptur, Penis und Parameren wie in Fig. 2 ..... *brunneus* Marsh.
– Kopf ohne Mikroskulptur 2
2. Grösser (4-5 mm) und breiter, Kiefertaster und Hinterschenkel meist geschwärzt, Penis und Parameren wie in Fig. 1 ..... *longulus* Mannh.
— Kleiner (3-4 mm) und schmäler, Kiefertaster und Hinterschenkel gelb oder gelbbraun 3
3. Kiefertaster gelb, Fühler rotgelb, mitunts zur Spitze leicht gebräunt, Mikroskulptur am Halsschild und besonders am 5. freiliegenden Tergite kräftiger und mehr offen. Penis und Parameren wie in Fig. 3 *bimaculatus* Boisd.Lac. (*ruficornis* Kr.)
— Kiefertaster gelbbraun, Fühler braun mit braungelber Basis, Mikroskulptur viel schwacher und dichter, Penis Parameren wie in Fig. 4 ..... *despectus* n. sp.

BESCHREIBUNG VON *MYCETOPORUS DESPECTUS* N. SP.

Kopf mit Ausnahme des Mundes schwarz, Kiefertaster gelbbraun, Fühler brau nmit braungelber Basis, drittes Glied so lang oder ein wening länger als das zweite, viertes meist etwas länger als breit, die vorletzten etwa 1½ mal so breit als lang.

Halsschild schwarz oder schwarzbraun mit hellerem Hinterrand, nach rückwärts wenig, nach vorne stärker verengt, kaum breiter als die Decken an den Schultern, auf der Scheibe jederseits mit zwei, oder bisweilen einem, Punktgrübchen.

Deckflügel an der Naht ein wenig länger als der Halsschild, rotgelb, das Schildchen und seine Umgebung, die Seitenränder und im Endhälfte ein Makel oder eine die Naht freilassende Querbinde braun oder schwarz. Bisweilen ist die Querbinde reduziert oder fehlend.

Hinterleib schwarz mit rotbraungesäumten Hinterrändern der Segmente, ziemlich kräftig und mässig dicht punktiert.

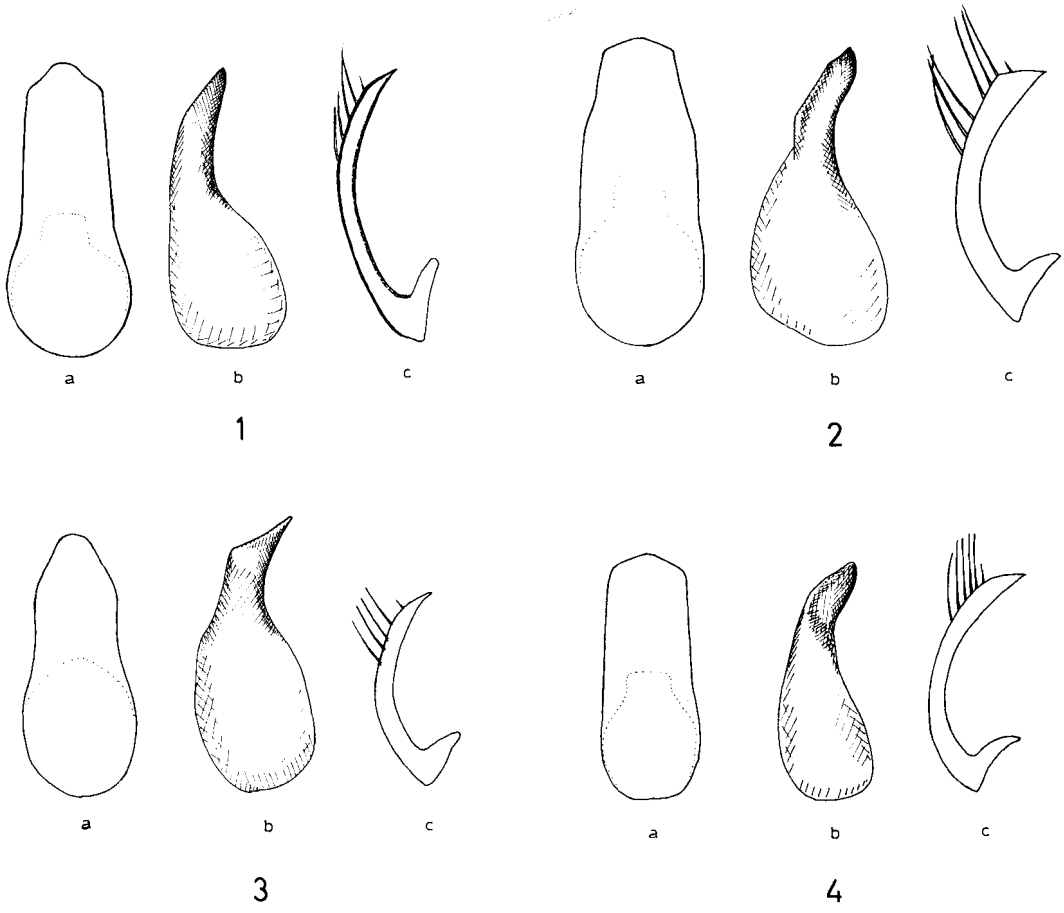

Fig. 1–4. Penis, Ventralansicht (a), Penis, Lateralansicht (b) und Paramere (c) von 1. *Mycetoporus longulus* Mannh., 2. *Mycetoporus brunneus* Marsh., 3. *Mycetoporus bimaculatus* Boisd. Lac. (*ruficornis* Kr.), 4. *Mycetoprus despectus* A. Str. (Anders Vik del.)

Mikroskulptur am Halsschild ziemlich offen und schwach, an den Deckflügeln und am 5. freiliegenden Tergite sehr dicht und äusserst schwach.

Länge: 3.8-4.0 mm.

Holotype: Ein ♂ von mir in Röa, Oslo gefunden und in meiner Sammlung.

Von *bimaculatus (ruficornis)* unterscheidet sich diese Art vor allem durch viel schwächere und besonders am 5. freiliegenden Tergite viel dichtere Mikroskulptur, durch ein wenig dunklere Palpen und dunklere, zweifärbige Fühler. Bisweilen sind jedoch die Fühler von *bimaculatus* schwach zweifärbig.

Von *brunneus* unterscheidet sie sich deutlich durch das Fehlen von Mikroskulptur am Kopf, und von *longulus* durch viel schmälere Gestalt, weniger dunkel gefärbte Palpen, Fühler, Kopf und Halsschild und kürzere Fühler.

Bimaculatus sensu Luze unterscheidet sich von *despectus* durch die überaus breiten vorletzten Fühlerglieder.

Lohse, dem ich ein Exemplar von *despectus* vorgelegt habe, ist auch der Ansicht dass es sich um eine von *bimaculatus* verschiedene Art handelt.

Professor Fagel hat mir ein Exemplar aus Minsk und zwei Exemplare aus Ulrichskirchen

in N. Österreich, von J. Spurny gesammelt, vorgelegt, die mit *bimaculatus* sensu Luze in guter Übereinstimmung sind. Es wäre von Interesse zu wissen wie es sich mit dem Aedeagus dieser Art verhält, leider ist es mir aber nicht gelungen ein ♂ zu sehen.

Weiter haben mir Fagel ein Exemplar aus Liverpool, Professor Franz zwei Exemplare aus Forchach, Tirol (leg. Dr. Kofler) und je ein Exemplar aus Unterberg, A. i. ind Bad Voslau, Nieder-Donau und Dr. Stockmann ein Exemplar aus Ach Lauterach vorgelegt, die ich alle für *despectus* halte.

Die Ausbreitung der vier nordischen Arten in Norwegen ist wie folgt (verkürzte Angaben der Gebiete nach Strand 1943):

brunneus: Über das ganze Land.

longulus: AK.

bimaculatus (ruficornis): AK, HEs, Os, On, Bö, TEy, AAy, Ry, STy, STi, NTi.

despectus: Ö, AK, HEs, Bö.

Ich habe *despectus* einmal am Fuss einer Eiche, einmal fliegend und mehrmals in Anspülicht gefunden.

Für Hilfe mit Material und Auskünften danke ich den zoologischen Museen in Oslo, Bergen und Trondheim, A. Descarpentries, Paris, Professor G, Fagel, Bruxelles, Br. Folwaczny, Bad Hersfeld, Professor H. Franz, Wien, Dr. Victor Hansen, Köbenhavn, J. Jarrige, Chatenay-Malabry, Professor A. Kofler, Lienz, Professor Carl H. Lindroth, Lund, Dr. G. A. Lohse, Hamburg, Ingenieur A. von Peez, Brixen, Dr. Sten Stockmann, Helsingfors und Dr. H. Vogt, Darmstadt. Ich danke auch Lehrer Anders Vik, Sandefjord für die Zeichnungen.

Eingegangen 3 Oktober 1968

LITERATUR

Boisduval, G. A. & Lacordaire, J. Th. 1835. *Faune entomologique des environs de Paris, ou species general des insectes qui se trouvent dans un rayon de quinze à vingt lieues aux alentours de Paris.* Paris (696 p.).

Ganglbauer, L. 1895. *Die Käfer von Mitteleuropa,* Band 2. Wien (881 p.).

Hansen, V. 1964. Fortegnelse over Danmarks biller (Coleoptera). *Ent. Meddr. 33,* 1-507.

Hellén, W. 1925. Die nordeuropäischen Arten der Gattung *Mycetoporus* Mann. (Col.). *Notul. ent. 5,* 33-47.

Hellén, W. (Red. cur.) 1939. *Catalogus Coleopterorum Daniae et Fennoscandiae.* Soc. Fauna Flora fenn. Helsingfors (129 p.).

Horion, A. 1967. *Faunistik der mitteleuropäischen Käfer. Band XI: Staphylinidae. 3. Teil: Habrocerinae bis Aleocharinae (Ohne Subtribus Athetae).* Überlingen-Bodensee (419 p.).

Lindroth, C. H. (Red. cur.) 1960. *Catalogus Coleopterorum Fennoscandiae et Daniae.* Entom. Sällsk. Lund (478 p.).

Lohse, G. A. 1964. Fam. Staphylinidae I (Micropeplinae bis Tachyporinae) *in* Freude, H., Harde, K. W., Lohse, G. A.: *Die Käfer Mitteleuropas.* Band 4. Goecke & Evers, Krefeld (264 p.).

Luze, G. 1901. Bolitobiini. Revision der paläarktischen Arten der Staphyliniden-Gattungen *Bryocharis* Boisd. & Lac., *Bolitobius* Mannh., *Bryoporus* Kraatz und *Mycetoporus* Mannh. *Verh, zool.-bot. Ges. Wien 51,* 662-746.

Palm, T. 1966. Svensk insektfauna. 9. Skalbaggar. Coleoptera. Kortvingar: Fam. Staphylinidae, Underfam. Habrocerinae, Trichophyinae, Tachyporinae. Häft 4. Stockholm (93 p.).

Strand, A. 1943. Inndeling av Norge til bruk ved faunistiske oppgaver. *Norsk ent. Tidsskr. 7,* 208-224.

Observasjoner av *Calopteryx splendens* Harris (Odonata)

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SOLEM, J. O. 1969. Observasjoner av *Calopteryx splendens* Harris (Odonata) [Observations on *Calopteryx splendens* Harris (Odonata)]. *Norsk ent. Tidsskr. 16*, 59-60. *Calopteryx splendens* Harris (=*Agrion splendens* (Harris)) is reported found at the Berby river system, Halden, Östfold county. This species has not been collected in Norway since 1890. On the 29 July and 4 August 1968, great numbers of *C. splendens* were seen swarming just below the outlet of two ponds in the river system. Information on the behaviour during swarming is given.

Calopteryx splendens Harris (= *Agrion splendens* (Harris)) ble for første gang påvist å tilhöre den norske fauna i 1889. Da ble ett eksemplar, en hunn, funnet ved Ås i Akershus av H. Kiær, og i 1890 fant Bidenkap en hann ved Jarlsberg i Vestfold (Sömme 1937). Dette er såvidt jeg vet, de to eneste funnene som er omtalt i litteraturen her i landet, og Sömme (1937) sier at for å være sikker på at arten fremdeles tilhörer den norske fauna må den gjenfinnes.

Sommeren 1968 ble 9 eksemplarer, 8 hanner og 1 hunn, av *C. splendens* fanget på to steder ved Berbyelva i Halden. Ekskursjonene ble gjort 29/7. til Svingen bro og 4/8. til Rösvatn. På begge stedene ble *C. splendens* funnet ved utlöpet av stilleflytende partier i elva. Med hensyn på vegetasjonen syntes lokalitetene nokså like. Den submerse vegetasjonen besto i alt overveiende grad av *Fontinalis antipyretica* som nesten totalt dekket steinene på bunnen i utlöpet og nedover elva. Her og der i utlöpet sto også kolonier av *Myriophyllum alterniflorum*, som det ble betydelig mere av i de stille partiene. Langs breddene sto *Alnus glutinosa* og *Betula sp.* — sumpskog med blant andre, arter som *Lysimachia thyrsiflora, L. vulgaris, Filipendula ulmaria, Lythrum salicaria, Mentha arvensis, Alisma plantago-aquatica, Scirpus silvaticus* og *Carex acuta*.

C. splendens svermet i stort antall ved disse to lokalitetene like nedenfor utlöpet av de stilleflytende partiene i elva. Ved Svingen bro svermet arten i vind opptil 2 m pr. sek., mens det ved Rösvatn var vindstille da observasjonene ble gjort. Begge dager var det solskinn og med lufttemperaturer mellom 21 og 22°C. Under svermingen sto *C. splendens* i grupper eller små svermer på forskjellige steder over

elva. Uten at det ble nöyere undersökt syntes svermene å stå over mere stilleflytende kulper eller partier i strømmen som hadde en forholdsvis jevn og stabil overflate.

Svermene sto lavt, opp til ca. 50-60 cm over vannet og så langt forfatteren kunne avgjöre det besto de av bare hanner. Hunner ble også observert, men de flöy mere på kryss og tvers i hele området hvor svermene sto. Svermene skiftet ofte plass, og individer i en sverm ble sett fly bort til en annen sverm for så å slutte seg til denne. Svermingen var en flagrende flukt fra side til side og utslagene til sidene varierte fra sverm til sverm. Selv om langt de fleste individene var tilsluttet en eller annen sverm, så en også individer som syntes å fly over hele området. Pettersen (1910) sier at individene svermer kun en kort tid av gangen, noe som også syntes å gjelde for de omtalte observasjonene ved Berbyelva. Under hvilepausene satt individene ofte på steiner ute i elva, og enkelte ganger ble hele svermer sett slå seg ned på samme stein.

C. splendens syntes å være sterkt knyttet til utlöpet av disse to stilleflytende partiene i Berbyelva, da den ikke ble funnet på andre lokaliteter langs elva. Dette har nok sammenheng med at larvene lever i svakt strömmende vann (Petersen 1910), og at elva de fleste steder er forholdsvis hurtigströmmende.

I Danmark hvor arten er meget vanlig er dens flyvetid fra förste halvdel av juni til förste halvdel av august (Petersen 1910). De funn som er gjort i Norge er datert 1/7. ved Ås, 29/7. og 4/8. ved Berbyelva og 22/8. ved Jarlsberg.

Selv om det foreligger få arbeider over norske odonater så må *C. splendens* antagelig bli regnet som sjelden eller meget lokal her i landet, og den er av Sömme (1937) behandlet blant de sydöstlige artene av odonatene. Materialet er oppbevart på zoologisk avdeling ved Det Kgl. Norske Videnskabers Selskab, Museet. Trondheim.

LITTERATUR

PETERSEN, E. (1910) Guldsmede, Dögnfluer, Slörvinger og Copeognather. *Danm. Fauna. 8*, 1-163.

SÖMME, S. (1937) Zoogeographische Studien über norwegische Odonaten. *Avh. norske Vidensk.Akad. Oslo nr. 12*, 1-134.

Mottatt 15 oktober 1968

†

Nils Knaben

Förstekonservator Nils Knaben döde 3. januar 1969 etter et kort sykeleie. Det var hjertet som sviktet. Det var så uventet for oss entomologer som alle sikkert ventet at han skulle få leve i mange år ennå, for «Få har alderen röynet mindre på», som konservator Astrid Löken bemerket i sin hyldest til Knaben som zoolog og menneske ved hans 70-årsdag (Norsk ent. Tidsskr. 15 (1968), 81-82.)

Undertegnede som har kjent Knaben i mere enn 30 år, vil her vesentlig omtale hans lepidopterologiske virksomhet. Knaben var en fremragende «field entomologist» med et grundig kjennskap til insektenes biologi og var også vel skolert i botanikken. Jeg hadde selv den glede å være sammen med ham på mange ekskursjoner. Knaben har foretatt innsamlinger av Lepidoptera og andre insekter, spesielt i Aust-Agder, ved Bergen, i Sogn, Valdres, Dovre og Nord-Norge.

Knaben var den første norske entomolog som for alvor gikk inn for studiet av genitaliene hos Lepidoptera. Et resultat av dette var påvisningen av den nye art, *Eupithecia fennoscandia* Knaben. Han undersökte stort materiale av vanskelige slekter som *Toxocampa* Guen., *Apamea* Tr. (*Hydroecia* auct.), *Eupithecia* Curt. og nærstående slekter, *Scoparia* Haw. samt sekkspinnerne (Psychidae etc.). Bare de to første slekter er blitt publisert. En av grunnene til at han ikke rakk å bli ferdig med de andre grupper, var sikkert hans store hjelpsomhet overfor mindre erfarne lepidopterologer. Det er ikke få timer Knaben brukte på bestemmelser av dyr for andre, for enkelte bestemte han tusenvis av Lepidoptera.

Det var ikke uventet at Knaben fikk tillitsverv i Norsk entomologisk forening. Fra 1947–1950 var han sekretær og fra 1956–1965 var han redaktör av Norsk entomologisk Tidsskrift. Som redaktör var han grundig og nöyaktig, men ikke pedantisk, og forstod å bringe tidsskriftet opp på et meget höyt nivå. Han var også virksomt medlem av komiteen for norske insektnavn.

I mange år var jeg nesten daglig sammen med Knaben på Zoologisk Museum, og jeg skylder ham stor takk for all den hjelp og instruksjon som jeg mottok i årenes löp.

Nils Knabens entomologiske publikasjoner er følgende:

1931. Spermatogenese bei *Tischeria angusticolella* Dup. *Z. Zellforsch. mikrosk. Anat. 13*, 2, 290-323.

1935. Lepidoptera. Nye arter for norsk fauna. *Norsk ent. Tidsskr. 3*, 405-408.

1937. Zoological Results of the Norwegian Scientific Expeditions to East-Greenland VI. Makrolepidopteren aus Nordostgrönland. *Skr. Svalbard Ishavet 71*, 1-38.

1940. De norske artene av slekta *Toxocampa* Guen. *Bergens Mus. Årb. Nat. rekke 1939-40. (6)*, 1-16.

1944. Oversikt over Norges Orthoptera. *Bergens Mus. Årb. Nat. rekke 1943, (2)*, 1-43.

1945. Drivhuskakelakken, et skadedyr i plantehus. *Naturen 69*, 276-286.

1946. Beretning om en del Lepidoptera-arter, nye for Norges fauna. Beskrivelse av *Tinea pallescentella* Stt. f. *semilineatella* n. f. *Bergens Mus. Årb. Nat. rekke 1944, (2)*, 1-12.

1949. *Eupithecia fennoscandica* n. sp. (Lepid. Geometridae) *Ent. Tidskr. 70*, 77-81.

1950a. Insektliv, pp. 22-95 in Føyn, B., Ruud, G. Røise, H. (ed.), Norges Dyreliv, Oslo.

1950b. Meddelelse om funn av *Rhyacia dahlii* Hb. (Lepid. Noct.). *Norsk ent. Tidsskr. 8*, 124-125.

1951. Notes on the Norwegian Lepidoptera (Noctuidae, Geometridae) *Norsk ent. Tidsskr. 8*, 203-206.

1955. Lepidoptera new to Norway (Noct. Geom.). *Norsk ent. Tidsskr. 9,* 252-253.

1956. On the occurrence and distribution of the *Apamea* Tr. (*Hydroecia* auct.) species in Norway (Lep. Noct.). *Norsk ent. Tidsskr. 10,* 48-62.

1957. Lepidoptera-nytt. *Norsk ent. Tidsskr. 10,* 153-156.

1959. Tre nye norske Lepidoptera. *Norsk ent. Tidsskr. 11,* 94-95.

1960. *Apamea fucosa* Frr. x *A. crinanensis* Burr., a possible hybrid specimen from Lom in Central Norway (Lep. Noctuidae). *Norsk ent. Tidsskr. 11,* 181-183.

Dessuten har Knaben etter forfatterens död, fått utgitt

Werner, J. 1939-1940. Sunnmöre Macrolepidoptera. *Norsk ent. Tidsskr. 5,* 123-167.

Magne Opheim

Entomologica Scandinavica

Et nytt nordisk tidsskrift

Etter overenskomst mellom entomologiske foreninger i de fire nordiske land er det besluttet å utgi et felles nordisk tidsskrift fra 1970. Dets formål er i første rekke å presentere entomologisk forskning i Norden, som kan være av almen interesse, for et internasjonalt publikum. Sproget blir engelsk, fransk eller tysk. Til entomologi regnes også andre landarthropoder enn insekter. Artikler innen anvendt entomologi mottas gjerne.

Som hovedansvarlig for tidsskriftet står den nystiftete «*Societas Entomologica Scandinavica*». Hver av de medvirkende foreningene har valgt en representant til den nye foreningens styre, og dette fungerer samtidig som tidsskriftets redaksjonskomite. Professor Carl H. Lindroth, Lund er valgt til hovedredaktör, og tidsskriftet vil bli trykket hos Berlingska Boktryckeriet, Lund. Docent Bengt-Olof Landin, Lund er valgt til redaksjonssekretær. Styret (redaksjonskomitéen) har dessuten följende medlemmer:

Professor Lars Brundin, Entomologiska Föreningen, Stockholm.

Fil. dr. Harry Krogerus (formann), Entomologiska Föreningen, Helsingfors.

Mag. scient. Leif Lyneborg, Entomologisk Forening, Köbenhavn.

Dr. philos. Lauritz Sömme, Norsk Entomologisk Forening, Oslo.

Medlemmer av de medvirkende nordiske foreningene kan inngå som medlem i Soc. Ent. Scand. Medlemsavgiften inkluderer samtidig abonnement på tidsskriftet til sterkt redusert pris. Det nöyaktige belöp er ennu ikke fastsatt, og blir avhengig av tidsskriftets omfang. Dette er forelöpig anslått til 320 sider for årgangen 1970, men kan tilpasses etter antallet av innsendte manuskripter.

Redaksjonskomitéen henvender seg til alle nordiske entomologer, som har liggende manuskripter av almen interesse og passende omfang (vanligvis ikke over 32 trykte sider), eller regner med å ha manuscripter ferdige i löpet av 1969, *med en oppfordring om å sette seg i forbindelse med redaksjonen* under nedenstående adresse. Det er viktig at det nye tidskriftets første årgang blir godt planlagt, og viser flest mulig sider av nordisk entomologi. Redaksjonen er derfor interessert i kontakt med mulige forfattere så snart som mulig, selv om deres bidrag bare befinner seg på et forberedende stadium.

Nærmere detaljer om tidsskriftet og den nye foreningen vil bli sendt til de nordiske entomologiske tidsskriftene i löpet av hösten 1969.

Zoologiska Institutionen, Lund
Januar 1969

C. H. Lindroth *B.-O. Landin*

Bokanmeldelser

Hansen, V. 1968. Biller XXIV. Sandspringere og löbebiller (Cicindelidae og Carabidae). Larvene ved Sv. G. Larsson. 2. omarbejdede udgave. Danmarks fauna 76. Gads Forlag, Köbenhavn. (451 pp.)

Siden den første utgaven av löpebilledelen i Danmarks fauna kom i 1941 er ni nye arter påvist i Danmark. Boken ökede sidetall (fra 380 til 451) skyldes dog vesentlig en rekke andre endringer. Antall illustrasjoner er öket, en ny tabell er tatt med, biotopbeskrivelsene for de enkelte arter er blitt langt mer fyldige og nöyaktige, og beskrivelser og bestemmelsestabeller av larver omfatter en rekke tidligere ukjente arter. Slekts- og artsbeskrivelsene av imagines er omtrent identiske med de i den gamle utgaven. En del endringer i nomenklaturen er foretatt i den nye utgaven. Beskrivelser og tabeller er stort sett fyldige og gode.

En vesentlig forbedring i den nye utgaven er at det ved siden av en slektsgruppetabell og særskilte slektstabeller for hver slektsgruppe, finnes en tabell som behandler alle carabide-slekter under ett. Det er nok lettere å komme riktig frem ved hjelp av en slik samlet slektstabell enn via en slektsgruppe-tabell, og en får også en ekstra mulighet for å sjekke bestemmelsene.

Illustrasjonene er svært gode, og dette gjelder i særlig grad de nye som er kommet til. De er renere tegnet og viser detaljer bedre. Enkelte av de gamle illustrasjonene er noe omtegnet og har absolutt vunnet på dette.

De störste endringer i den nye utgaven er foretatt med larvedelen, hvilket er rimelig, da mange nye former er blitt kjent og kunnskapen om deres morfologi er föröket. Slektsgruppe-tabellen for larvene er forbedret. Likevel mener anmelderen det er lagt for liten vekt på mange av de morfologiske karakterer som er brukt av Van Emden (Trans. R. ent. Soc. Lond. 92, 1942) og som må anses essensielle ved adskillelsen.

Larvesystematikk er et vanskelig område. Det er ofte större variasjon enn en tidligere regnet med i de karakterer som brukes ved artsadskillelsen. Forfatteren viser da også en mer kritisk holdning i den nye utgaven, i det han fremhever usikkerheten i tabellene innenfor visse slekter. I enkelte tilfelle legges det vekt på karakterer som synes anmelderen uvesentlige og usikre ved artsadskillelsen, mens andre og kanskje viktigere oversees. Som helhet forringer dog dette i liten grad den store nytte en vil kunne ha av denne delen av boken.

Artenes biologi behandles både i imago- og larvedelen, hvilket gjör boken anvendelig også ut over det rent systematiske og kan stimulere amatörer til ikke bare å gå på jakt etter nye arter.

Selv om boken ikke tar med det ganske store antall norske arter med en nordlig utbredelse, vil den iallfall for entomologer som arbeider i Syd-Norge være meget anvendelig.

Johan Andersen

Norsk Entomologisk Forening, Insektnavnkomitéen. 1968. Norske Dyrenavn. B. Insekter og edderkoppdyr. Norsk Zoologisk Forening, Oslo. (77 pp.)

Det gleder oss at vi har fått en samlet oversikt over norske navn på insekter og edderkoppdyr. NEF's insektnavnkomité med J. Fjelddalen (formann), A. Bakke, N. Knaben og R. Sundby som arbeidsutvalg, fortjener takk for sitt arbeide.

Listen er ordnet alfabetisk både etter norske og vitenskapelige navn, med en henvisning til orden og familie, som gjör det lett å finne frem til artenes systematiske plassering. De norske navn er stort sett presentert slik de har foreligget, men ved å foreta enkelte korrigeringer har komitéen önsket å trekke opp visse retningslinjer for navnebruk. Listen vil nok före til en mer enhetlig bruk av allerede forekommende navn, og også virke som norm når det i fremtiden gis norske navn til nye arter.

Trygve Rygg

Cobben, R. H. 1968. Evolutionary trends in Heteroptera. Part I. Eggs, architecture of the shell, gross embryology and eclosion. Centre for Agricultural Publishing and Documentation. Wageningen (475 pp.) (Pris 55,— gylden).

Tegene blir stort sett rekna for å vere ei forholdsvis lita og oversiktleg insektgruppe. Likevel skal ein ikkje bla mykje i Teteroptera-litteratur för ein blir klar over at det er nokså skiftande oppfatningar om den systematiske inndelinga av underordenen.

Ei årsak til dette kan vere at evolusjonsliner og slektskap innafor tegene har vore lite granska. Nederlendaren Cobben har tatt desse spörsmåla opp til nærare studium. Förste bind i ein planlagd serie föreligg nå. Her tar Cobben for seg *eggstadiet,* — sjölve egga, embryologien, og eggklekkinga. Materialet omfattar gransking av 400 arter frå ulike delar av verda fordelt på 55 familiar. Stort sett er ei typisk og ei lite typisk art vald ut for kvar familie. Ei detaljert framlegging of dröfting av resultata opptar storparten av boka. og ei förebels vurdering blir gitt over kva arbeidet kan ha å seie for klassifiseringa av tegene.

Det er også tatt med eit oversyn over materiale som vil bli publisert i seinare bind. Når arbeidet er fullfört, vil det utan tvil gi eit sikrare grunnlag for ei fylogenetisk rett systematisk inndeling av Heteroptera.

Boka inneheld ei lang rekkje svært gode strekteikningar. Også elektromikroskop er nytta. Særleg bileta av overflatestrukturar som har kome fram ved bruk av det såkalla «scanning» elektronmikroskop er imponerande gode. — Boka har ei litteraturliste på omlag 450 publikasjonar.

Gudmund Taksdal

Höeg, Ove Arbo. 1968. Vitenskapelig forfatterskap. Universitetsforlaget, Oslo. (108 pp.) Pris kr. 8.55.

Publisering av vitenskapelig materiale utgjör en viktig del av enhver forskers arbeide. Avhandlingens form og disposisjon må tillegges stor vekt for at innholdet på best mulig måte skal bli tilgjengelig for leseren. Siden professor Höeg kjenner biologenes spesielle problemer, er den boken han nå har utgitt ikke minst velegnet for denne gruppen av forfattere.

Boken henvender seg også til et större publikum, og gir verdifull veiledning for alle forfattere av vitenskapelige avhandlinger. Foruten en diskusjon om hvorledes materialet bör disponeres, gis det en rekke gode råd om sprogföring, forkortelser, tegnsetting m. m. Regler for oppsetting av litteraturfortegnelse, utforming av manuskript og illustrasjoner blir behandlet i egne kapitler, likeledes en innföring i korrekturlesning.

Boken vil uten tvil bli grunnleggende for stilen i mange norske tidsskrifter, og kan bl. a. anbefales for forfattere i Norsk entomologisk Tidsskrift.

Lauritz Sömme

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In the case of articles submitted in a language other than English, the abstract, Table headings and Figure legends must also be translated into English.

Brief *Acknowledgements* of grants and other assistance, if any, will be printed at the end of the text.

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All illustrations are to be considered as Figures. Each graph, drawing or photograph should be numbered in sequence with arabic numerals, and should be identified on the back by the name of the journal, the author's name, and the Figure number. The top should be indicated. The Figures should be the original drawings. The columns of *Norsk Entomologisk Tidsskrift* are 67 mm broad, and the size of the original drawings should be in proportion. Lines must be thick enough to allow for reduction. Letters and numbers should not be less than 2 mm high in the printed illustration. Photographs should be submitted as unmounted glossy enlargements showing good details.

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REFERENCES TO LITERATURE

In the text, Brown (1957), Brown & White (1961). If more than two authors, Brown et al. (1963). Multiple references: 'As several authors have reported (Brown 1957, Brown & White 1961, Green et al. 1963)', i. e. chronological order, no commas between names and year.

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Examples:

Löken, A. 1964. Social wasps in Norway. (Hymenoptera, Vespidae). *Norsk ent. Tidsskr. 12,* 191-218

Schwarts, R. J. 1955. *The Complete Dictionary of Abbreviations.* 211 pp., T. Y. Cromwell Co., New York.

Whitman, L. 1951. The arthropod vectors of yellow fewer, pp. 229-298 in Strode, K. (ed.). *Yellow Fever.* McGraw-Hill, New York and London.

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