

A new species of *Macrosiphum* from *Chamaenerium* (Homoptera, Aphididae).

By

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Description of *Macrosiphum lisae* n. sp.

Apterous viviparous female

Morphological characters: Body about $2\frac{1}{2}$ — $3\frac{1}{2}$ mm long and oval. Tergum evenly pale yellowish, faintly reticulated at least on the hindermost part of the abdomen, this pattern being made by minute thorns (fig. 1). The body sparsely haired, the hairs relatively short, especially dorsally. At least some of the dorsal hairs blunt or capitate. Frons with well developed, lateral, diverging tubercles and a rather low median tubercle. Frontal hairs a little shorter than basal diameter of IIIrd antennal segment. The antennae about $1\frac{1}{4}$ times as long as the body, rather pale except the very apices of segments III to V, the very bases of IV-VI, and the area around the primary rhinarium on VI. Processus terminalis usually is more than four times as long as base of segment VI, about 1,3 times segment III. Segments IV and V are nearly of the same length, only a little shorter than III. The surface of the antenna is imbricated, also segments I and II are rather rough. Antennal hairs as long as or shorter than half of the basal diameter of segment III. Segment III with 2-7 small secondary rhinaria (on an average out of 57 individuals: 4,1) in a row on the basal third (or a smaller part). Rostrum reaches to the middle coxae. The apical rostral segment about $\frac{3}{4}$ of the length of the second segment of hind tarsus, with 5-6 pairs of hairs besides the basal pair and the small apical setae. The long second rostral segment has a very distinct pattern of dotted lines made up of small spinules. Prothorax with marginal tubercles. The ventral surface of thorax rather wrinkled. Mesothoracal furca with united branches on a short stem. Meta-

thoracal furca with widely separated branches. Legs long, thin, and pale, usually only the very knee and the second tarsal segment brown. First tarsal segments with 3 hairs. Abdominal hairs on the dorsum of segments I-VII shorter than half of the basal diameter of IIIrd antennal segment, whereas the ventral hairs are longer, until the double length of the dorsal hairs. Tergite of VIIIth abdominal segment with about 8 hairs, the longest nearly as long as basal diameter of IIIrd antennal segment. Anterior part of subgenital plate usually with 4 hairs. Abdominal segments II-V with small, pale, round, marginal tubercles, a little dorsally of stigmata, alternating with them. Spinal tubercles of the same appearance often present on abdominal segments VII and VIII. Siphunculus about 0,80 mm long, pale, thickest at the very base, thinnest near apex, faintly thicker about one third from apex than in the middle (in other words: faintly swollen), imbricated, with wrinkles on basal $\frac{1}{4}$, with 4-5 rows of hexagonal cells at apex, the reticulated area being about 9 % of the whole length, and with a distinct flange. Cauda about 0,5 mm long, pale, finger-shaped, rather acute, not constricted at base, with 8-10 hairs.

Colour: White, faintly yellowish. Eyes black. Antennae whitish with black borders between the segments. In the larval stages the colour is white, not yellowish except sometimes on the hindermost part of the abdomen.

Measurements: See table 1.

A late viviparous female

Morphological characters: Body about 3 mm long. The IIIrd antennal segment with 12-18 secondary rhinaria (on an average out of 17 individuals: 15,1) on basal $\frac{2}{3}$ to $\frac{3}{4}$, some of them measuring the double diameter of some others (fig. 2). Prothorax with distinct, small, but projecting marginal tubercles. The wings hyaline with brownish veins, venation normal. Apices of tibiae concolourous with tarsi. Abdomen with small, flat, pale, marginal tubercles on segments II-V in the middle of marginal sclerites, which have a much darker pigmentation on segments II-IV than on V. Siphunculi sometimes may be a little constricted at the very base, are about 0,7 mm long, with apical $\frac{1}{7}$ reticulated, and otherwise similar to the siphunculi of the apterous female. Abdominal tergites VII and VIII often with small, round, pale, spinal tubercles. Cauda about 0,4 mm long, pale, with 8-9 hairs.

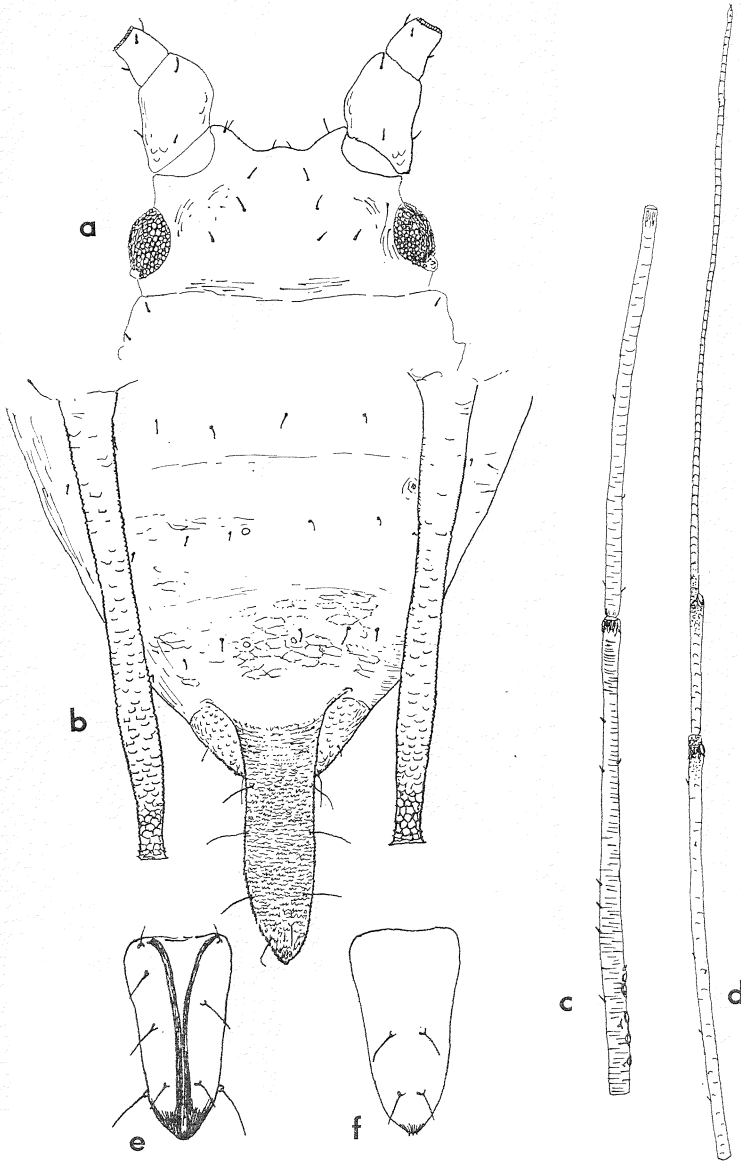


Fig. 1. *Macrosiphum lisae* n. sp., apterous viviparous female: a) head, b) hindmost part of abdomen with siphunculi and cauda, c) antennal segments III + IV, d) antennal segments V + VI, e) apical rostral segment as seen from the front and f) as seen from behind.

Table 1

Measurements (in mm) of viviparous females of *Macrosiphum lisae* n. sp.

Sample	Body	Antenna	Antennal segments					Siphunculus	Cauda	Apical segm. of rostrum	2nd segm. of hind tarsus	Rhin. on III	Caudal hairs
			III	IV	V	VIa	VIb						
<i>Apterae</i>													
June 14, 1964	3.30	4.09	0.89	0.79	0.76	0.29	1.11	0.80	0.48	0.12	0.17	4 + 5	8
—	3.23	4.07	0.91	0.73	0.76	0.27	1.12	0.80	0.50	0.13	0.18	3 + 3	8
—	3.35	4.16	0.94	0.81	0.77	0.27	1.10	0.86	0.52	0.12	0.17	2 + 5	9
June 29, 1964	3.33	4.29	0.96	0.80	0.82	0.28	1.19	0.87	0.54	0.12	0.17	4 + 5	9
July 20, 1964	3.20	4.11	0.91	0.76	0.78	0.26	1.14	0.86	0.50	0.12	0.17	3 + 6	8
—	3.13	4.08	0.93	0.76	0.77	0.28	1.13	0.84	0.50	0.12	0.17	7 + 5	8
July 30, 1963	2.98	3.90	0.87	0.70	0.70	0.26	1.11	0.72	0.43	0.13	0.16	3 + 3	10
July 31, 1963	3.06	3.71	0.73	0.76	0.70	0.23	1.05	0.80	0.47	0.12	0.16	5 + ?	8
—	3.00	3.97	0.88	0.76	0.74	0.24	1.11	0.77	0.49	0.12	0.17	5 + 4	10
—	3.26	4.03	0.89	0.75	0.72	0.29	1.11	0.81	0.49	0.12	0.16	5 + 4	10
—	3.07	3.94	0.81	0.78	0.76	0.24	1.11	0.78	0.46	0.10	0.16	7 + 5	8
August 5, 1963	3.21	4.00	0.89	0.74	0.73	0.26	1.13	0.76	0.49	0.11	0.16	7 + 4	7
—	3.09	3.57	0.82	0.67	0.70	0.24	0.91	0.74	0.46	0.12	0.16	5 + 3	8
—	3.57	4.31	0.93	0.82	0.83	0.27	1.20	0.87	0.51	0.13	0.17	5 + 4	8
—	2.64	3.44	0.74	0.63	0.64	0.23	0.97	0.64	0.41	0.11	0.16	4 + 3	6
—	3.33	4.01	0.86	0.79	0.74	0.26	1.10	0.83	0.53	0.13	0.16	6 + 4	10
Sept. 15, 1963	3.33	4.12	0.91	0.75	0.76	0.27	1.16	0.79	0.47	—	—	7 + 5	9
<i>Alatae</i>													
June 14, 1964	3.08	3.94	0.83	0.75	0.74	0.28	1.10	0.70	0.37	0.12	0.17	12 + 14	8
June 29, 1964	3.42	4.49	0.98	0.88	0.87	0.31	1.21	0.77	0.41	0.12	0.17	16 + 18	9
—	3.14	4.19	0.85	0.76	0.81	0.30	1.23	0.69	0.37	0.12	0.17	18 + 15	8
—	3.07	4.02	0.80	0.73	0.78	0.26	1.21	0.63	0.38	0.11	0.15	14 + 16	9
July 11, 1964	3.36	4.22	0.89	0.81	0.79	0.27	1.23	0.67	0.41	0.13	0.17	14 + 15	9
—	2.80	3.58	0.76	0.68	0.66	0.24	1.03	0.50	0.30	0.11	0.14	13 + 15	6
—	3.20	4.29	0.93	0.80	0.74	0.29	1.30	0.72	0.41	0.13	0.17	15 + 16	11
July 13, 1964	3.17	4.28	0.88	0.84	0.84	0.28	1.20	0.66	0.36	0.13	0.17	15 + 18	8
July 31, 1963	2.94	3.95	0.81	0.79	0.77	0.27	1.10	0.67	0.40	0.13	0.16	13 + 16	8
—	3.10	4.04	0.85	0.80	0.80	0.27	1.09	0.69	0.41	0.13	0.16	18 + 18	9
August 5, 1963	2.81	—	0.81	0.77	0.77	0.24	—	0.70	0.41	0.12	0.16	13 + 14	8

Colour: White, with dark brown, nearly black head and thorax.

Measurements: See table 1.

Oviparous female

Morphological characters: Much like the apterous viviparous female, but proximal half of hind tibia swollen with numerous pseudosensoria extending over proximal two thirds of the tibia. The IIIrd antennal segment with 2-6 secondary rhinaria (on an average out of 17 individuals: 3,8). Cauda may have more hairs than in the viviparous females, up to 13.

Colour: Yellowish white, often with brownish legs.

Measurements: See table 2.

Alate male

Morphological characters: Body about 2 mm long, very narrow. Abdomen with very distinct, dark, marginal sclerites and intersegmental, pleural "Muskelplatten". Usually also dark segmental spots or bands occur on the dorsum (one row along the mid line) and — paler — on the underside of the abdomen (in two rows). Antennae with a large number of secondary rhinaria, about 40 on IIIrd segment, 10 on IVth, and 20 on Vth; those on III are of different size; the rhinaria are not placed in a row on any segment, on V they often sit particularly on the distal half, on the other segments more evenly distributed. Siphunculi sub-cylindrical, rather thin, about 0,4 mm long. Cauda about 0,2 mm long, oblong-triangular, acute, and rather dark.

Colour: Red or pink, with brown head and thorax. Spots or bands on the abdomen. Reddish white or red in the larval stages.

Measurements: See table 2.

Fundatrix

(description based on one specimen only)

Morphological characters: Much like the apterous viviparous females from other generations, but antennae (especially processus terminalis) and siphunculi shorter. The siphunculus with only one or two rows of hexagonal cells under the flange. Antennal hairs and hairs on the frontal tubercles shorter than $\frac{1}{4}$ of basal diameter of IIIrd antennal segment. Antennae without secondary rhinaria. Cauda with 7 hairs.

Colour: Pale yellowish.

Table 2

Measurements (in mm) of the sexual forms of *Macrosiphum lisae* n. sp.

Sample	Body	Antenna	Antennal segments					Siphunculus	Cauda	III	Rhinaria (sec.) on	
			III	IV	V	VIa	VIb				IV	V
<i>Oviparae</i>												
Sept. 15, 1963	2.98	3.64	0.73	0.67	0.68	0.24	1.09	0.60	0.36	5 + 4	0	0
—	2.83	3.69	0.79	0.72	0.70	0.24	1.01	0.66	0.36	5 + 4	0	0
—	3.19	3.93	0.80	0.74	0.70	0.26	1.17	0.69	0.37	4 + 3	0	0
—	2.94	3.61	0.76	0.63	0.66	0.26	1.06	0.63	0.34	5 + 3	0	0
—	2.94	3.82	0.80	0.69	0.74	0.27	1.09	0.66	0.37	4 + 4	0	0
—	2.80	3.48	0.77	0.60	0.63	0.25	0.99	0.62	0.32	2 + 3	0	0
<i>Males</i>												
Sept. 15, 1963	2.29	3.81	0.77	0.69	0.67	0.24	1.24	0.44	0.21	40 + 41	11 + 9	22 + 23
—	2.21	3.82	0.80	0.69	0.72	0.21	1.19	0.44	0.20	47 + 42	15 + 11	21 + 18
—	1.93	—	—	—	—	—	—	0.41	0.20	—	—	—

Measurements: In mm: Body 2,83; antenna: 2,81; antennal segments III-VI: 0,74 — 0,40 — 0,60 — 0,27 + 0,59; siphunculus: 0,65; cauda: 0,38; apical segment of rostrum: 0,11; 2nd segment of hind tarsus: 0,15.

Type material

Holotype (jr. no. 2766 b, Blokhus, July 31, 1963, an apterous viviparous female) and paratypes are in the author's collection. Paratypes also in the following collections: The Zoological Museum of the University of Copenhagen, Denmark; British Museum, London, England; Dr. D. Hille Ris Lambers, Bennekom, Netherlands. The paratypes are collected at Blokhus on July 30 (2763 a-h), July 31 (2766 a + c-g), August 5 (2787 a-e), September 15 (2809 a-m) in 1963, on June 14 (2984 a-f), June 29 (3004 a-i), July 11 (3018 a-h), July 13 (3024 a-i), and July 20 (3032 a-k) in 1964. I take pleasure in naming this species after my wife, whose cooperation has been valuable for the study of Danish aphids.

Host plant

Chamaenerium angustifolium (L.) Scop. (= *Epilobium* a.), belonging to the plant family Oenotheraceae.

Geographic distribution

The species has only been found at Blokhus in northern Jutland, Denmark, on two localities in a coniferous plantation behind the dunes at the coast of the North Sea. Several collections are made from July 30, 1963, till September 13, 1964.

Biology

Occurrence on the host

The aphids sit on the undersides of middle and lower leaves, especially on leaves with withering, brownish tip and yellowish colour, perhaps caused by the aphids themselves. The colour is different from the yellowish red so often seen on leaves attacked by colonies of *Aphis corniella* (H.R.L.), a species which may occur on the same plant. On August 7 (1964) the green leaves on the type locality had an average number of 0,7 *M. lisae* n. sp., the yellowish leaves 4,0. Though the upper leaves seldom or never are infested, they may well serve as food source in rearing experiments.

Flowers did not appear on the plants on the type locality, a

rather shadowy place between coniferous trees (*Pinus mugo* and *Picea glauca*) in an old dune area. On the other locality, also in Blokhus Plantation, some specimens of the aphid were found on a flowering plant, however, in a rather sunny place.

I have not seen this aphid anywhere else, though *Chamaenerium angustifolium* has been studied very often on several localities.

Transfer experiments

Transfer to *Epilobium montanum* and *Vaccinium uliginosum* was tried, because *E. m.* belongs to the same family as *Chamaenerium*, and *V. u.* is a host of *M. nasonovi* Mordv., which is very similar to *lisae* n. sp.

It was possible to keep single individuals alive on leaves of *Epilobium* in corked glass tubes for 13 days at least, though the insects often stayed on the cork or the glass instead of the leaves. Some larvae reached maturity and bore until 7 youngs (apterous female) or 4 youngs (alate female). None of these youngs grew up. Aphids transferred to an *Epilobium*-plant in water in the laboratory disappeared after one day.

On two localities in Blokhus Plantation aphids were placed on *Vaccinium uliginosum* on June 29, 3 shoots on one locality, 5 shoots on the other, 3-5 individuals (apterae and/or larvae) on each shoot. The shoots were studied and shaken on July 13, but the aphids were not refound. The weather had been cold and windy with some rain. From August 16 till 21 some aphids were kept on *Vaccinium*-leaves in corked glass tubes, but they mostly stayed on glass and cork and did not feed on the leaves. They became emaciated. Some large larvae went through their last moult, but did not bear larvae. Small larvae could stand it only for a few days. All specimens were dead or dying after five days.

Conclusion: *Epilobium montanum* is not easily accepted; it may serve as a food source for a short time, but the vitality and the propagation of the aphids are below normal. *Vaccinium uliginosum* is not a host.

Cycle

The eggs have not yet been found in nature. Fundatrices with nearly mature offspring were observed on June 14 (1964), so probably the eggs will hatch in May, though I looked in vain for both eggs and aphids on May 10 and 16. Among the offspring

were nymphs with wing pads. The first alate female appeared on June 17. Alate females occur throughout the summer, are rather numerous in the middle of July, but disappear after the middle of August. After that time all nymphs with wing pads belong to the masculine sex.

During a part of the summer 1964, from July 14 till August 21, the development of individual aphids or small colonies was studied in corked glass tubes with leaves of the host, which were renewed at intervals of a few days. The glass tubes stood out-doors in the shadow. The larval period lasts 11-18 days in the apterous viviparous female according to several observations in the period concerned, about 17-18 days in the alate female (only one observation). As imago the apterous mother might live about 20 days. The maximum number of youngs per apterous mother is about 30-32, per alate mother perhaps only 12-15, but the observations of alate mothers are rather few.

The males appear from about August 10, the oviparous females from about August 20. The males are easily recognized already as larvae, because they are reddish. In 1964 red larvae were observed from July 25, adult males from August 11, that is after 17 days, which is the same duration of larval period as in the alate female at that time of year. The male development began at about the same time in 1963.

Red and white larvae may be born by the same mother, obviously not in a particular order, as shown in table 3.

Table 3

The colour of the larvae born by apterous mothers
(w = white = female larvae, r = red = male larvae)

Mother	Period of reproduction	Total number of youngs	Red larvae	White larvae	Succession of larvae
A	Aug. 3-19	26	11	15	10w-9r-4w-2r-1w
B	— 3-21	25	8	17	8w-1r-3w-4r-2w-1r-2w-2r-2w
C	— 3-16	19	9	10	10w-9r
D	— 3-18	23	8	15	13w-6r-1w-2r-1w
E	— 3-14	15	4	11	8w-4r-3w

The only thing which is common to the five apterous mothers A-E in table 3 is the starting of the reproduction with a batch of white larvae.

The colour of the larvae is not always constant. Many original-

ly red larvae gradually lose their colour turning pink or nearly white. A new-born white larva conversely may turn pink after some time. In table 3 both types are included among the red larvae. The mothers sometimes are faintly pinkish on the hindermost part of the abdomen, so the embryos obviously may be reddish too.

No direct observations of alate females bearing red larvae have been made, but the possibility cannot be excluded.

The relative number of males and male larvae increased in August (maximum 19 % of the population on August 30), but decreased in September in consequence of the gradual vanishing of viviparous mothers and increasing number of oviparous females, for which reason red male larvae as well as white female larvae became rather rare.

The copulation has been observed in September. The relatively small male sits in nearly vertical position. The fore legs rest upon the anterior part of the female abdomen, the middle legs on the margins of it on level with the siphunculi, and the hind legs under the belly of the female. The antennae of the male are rigidly straightened to the rear, parallel to the surface of the leaf.

Eggs appeared in glass tubes with living oviparae in the middle of September. They are white or yellowish white when just laid, but turn black after short time if fertilized. Egg-laying continues in October.

E n e m i e s

Predators did not play a great role on the type locality. Single syrphid larvae were observed in July-August, and a few aphids were killed by hymenopterous parasites in September, or were caught in spider's web.

Taxonomy

Very characteristic features of *lisae* n. sp. are the short hairs of antennae, head, and body, and the white or yellowish white colour. It may be separated from the very similar *nasonovi* Mordv. by these characters and by the structure of siphunculi and antennae (fig. 2 and table 4). It is possible to compare the viviparous females only, because the sexual forms of *nasonovi* are unknown.

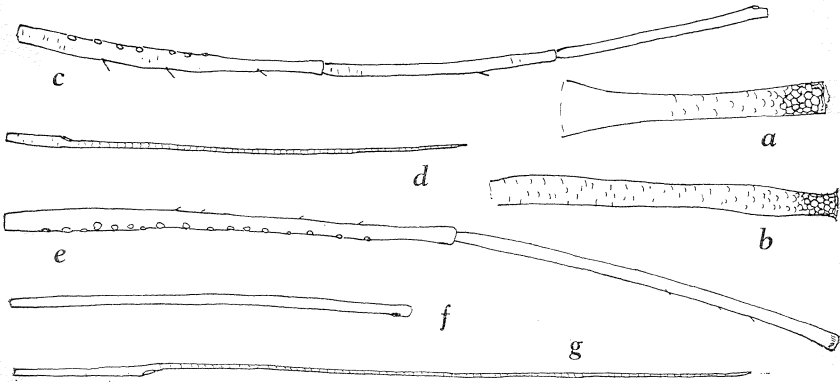


Fig. 2. *Macrosiphum nasonovi* Mordv. and *M. lisae* n. sp., alate viviparous females: a) siphunculus of *nasonovi* and b) of *lisae*, c) antennal segments III-V and d) VI of *nasonovi*, e) antennal segments III + IV, f) V, and g) VI of *lisae*.

Table 4

Some differences between *Macrosiphum nasonovi* Mordv. and *M. lisae* n. sp.

		<i>nasonovi</i>	<i>lisae</i>
Colour of body		green	whitish
Colour of apices of tibiae in apterae		as dark as or a little darker than the tarsi	paler than 2nd tarsal segments
Longest hair on frontal tubercles (in brackets: body length)		0,034 mm (2,3 mm)	0,025 mm (3 mm)
Length of antennal hairs in alatae in proportion to basal diameter of IIIrd antennal segment		0,6—0,8	0,4
Secondary rhinaria on IIIrd ant. segm.	apterae	1—3	2—7
	alatae	7—11	12—18
Prop. of ant. segments	VIIb/VIIa in apt.	4,9—5,7	4,0—4,4
	III/VIIa in apt.	4,4—4,6	3,3—3,7
	IV/III = V/III in apt.	about 0,8	about 0,9
	VIIb/VIIa in al.	more than 6	less than 5
Host plant families		Ericaceae + Vacciniaceae	Oenotheraceae

I wish to thank Dr. D. Hille Ris Lambers, Bennekom, Netherlands, for loan of slides of *Macrosiphum nasonovi* Mordv. (from *Chamaedaphne calyculata*, collected by Zirnits in Latvia on July 16, 1930), so that it was possible to compare the two species.

Anmeldelse.

Dyrenes liv. Forlaget Rhodos, København. — 1. bind, Erik Tetens Nielsen: **Insekter på rejse**. 117 sider, kr. 10.25 uindb. — 2. bind, S. L. Tuxen: **Insekt-stemmer**. 163 sider, kr. 17.00. Begge udk. 1964.

Bøger i serier er lidt af et tidens tegn; åbenbart giver det øgede salgsmuligheder. En ny zoologisk serie — Dyrenes liv kaldet — har fået en god start med ovennævnte første bidrag, der behandler emner, der nok kan interessere: hvordan og hvorfor foretager visse insekter lange rejser, og hvordan og hvorfor giver visse insekter lyde fra sig? Bøgerne er dog så forskellige, at man næppe kan mærke, at de tilhører samme serie. Tetens Nielsens bog er nærmest et letflydende causeri, baseret i det væsentligste på ret få eksempler, som han kender særligt til og har arbejdet med, men som dog belyser de almindelige principper for insektmigration, omend næppe udtømmende. Tuxens bog derimod kan vel næsten kaldes en oplysningsspækket lærebog, men skrevet i et så let sprog og i en sådan form, at man ikke skal lade sig afskrække. Insekter på rejse har nogle få og desværre sølle tegninger (se f. eks. bladlusene p. 76) til opmuntring for læseren, hvis denne ikke lader sig holde i ånde af forfatterens genvordigheder eller behageligheder (henholdsvis farve- og sherryorgier), mens insekt-stemmerne er fyldt med et væld af instruktive illustrationer; men indenfor dette emne er der jo også mere, der egner sig for billedlig gengivelse. Diagrammerne kan vel næsten skræmme læserne; men med støtte af den gode tekst vil de fleste snart være indført i alle mysterier om frekvenser, impulser, stavelser, chirps, amplitudemodulation etc., etc., som til at begynde med kan tynde som mange kilo Hz på den uforberedte læser. Men lidt teori er nødvendig for at forstå de mangfoldige lydfrembringelser.

Begge bøger lover godt for seriens fremtid; men vil der virkelig være muligheder nok for en sådan serie, der udelukkende er baseret på bidrag fra danske forfattere? Fem store naturhistoriske foreninger, der samarbejder med forlaget via en redaktionskomité, må tro det, og anmelderen ønsker det bedste. Foreningernes medlemmer får i øvrigt lidt rabat på ovennævnte priser, og medlemmer af Entomologisk Forening kan således få bøgerne uindb. for henholdsvis 8.25 og 13.65 kr. Indb. er priserne ikke beskedne, henholdsvis 21.50 og 26.00.

Børge Petersen.
