

A new species of *Dysaphis* Börner (Hom., Aphidoidea) from Sweden

By

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Börner (1940) gave a very short diagnosis of a new species *Neanuraphis newskyi* from *Heracleum* in Central Europe. He later (1952) placed the species in his subgenus *Annaja* of *Yezabura* Matsumura. In 1949 Shaposhnikov described a species *Yezabura aizenbergi* from *Heracleum sibiricum* in the U.S.S.R. Stroyan (1952) described a species *Sappaphis sphondylii* from *Heracleum sphondylium* in Scotland. Subsequent examination of the types of *Neanuraphis newskyi* Börner, by kind permission of Dr. Sachtleben of the Deutsches Entomologisches Institut, showed that *sphondylii* Stroyan was a synonym of *newskyi*. Both *newskyi* and *aizenbergi* are characterized by invariably alatiform apterous viviparae and even oviparae (both morphs bear secondary rhinaria at least on antennal joint III), by the aptery of the males and by a monoecious association with species of *Heracleum*. Neither can properly be placed in a subgenus with *Yezabura brancoi* Börner, the typus subgeneris of *Annaja* Börner, and in fact it appears very doubtful whether such a subgenus is called for at all. The proper placing of both species would appear to be in the genus *Dysaphis* Börner, 1931. The new species described hereafter is apparently a third member of the *newskyi* species-group within the genus *Dysaphis*, although the biology is as yet not completely elucidated.

Dysaphis ossiannilssoni, sp.n.

Apterous viviparous female. Described from 22 specimens. Body from 1.55 to 2.27 mm. long. Facies typical of the subgenus *Dysaphis sensu stricto*. Head normal, frons slightly sinuate, median and lateral prominences of roughly equal height; cuticle sclerotic, brownish pigmented, faintly reticulate. Frontal hairs variable in length up to a maximum of about 52 μ for the ventro-frontal pair, which are acute; the dorso-frontals much shorter, up to about 30 μ and not very acute. Vertical hairs usually rather short, median pair of occipital hairs always very short and blunt, nearly cylindrical, about 8—10 μ long, outer pair of occipitals nearly always similar, but rarely somewhat longer, up to 22 μ , and then rather acute. Paired tubercles always present occipitally. Antennae from rather less to rather more than half body length, processus terminalis from 2.5 to 3.6 \times basal part of VI. Tuberculate and often imperfectly formed secondary rhinaria present on joints III—IV

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or III—IV, their numbers ranging from 5—36 (mean 15.63) on III, from 1—15 (mean 5.91) on IV, and from 0—3 (mean 0.57) on V. Hairs on antennae acute but not very finely produced at apices, those on III being maximally from 20 μ to 32 μ long, or from 0.91 to 1.28 (means of two samples 1.19 and 1.09) \times articular diameter of III. Pronotum with a medially divided dorsal sclerotic band, meso- and metanotum with variable small scattered scleroites. Pronotum and mesonotum sometimes with paired or unpaired spinal tubercles. Rostrum rather long (segments II—IV inclusive from 0.72 to 0.80 mm. in total length), apical segment rather long and fairly acute, from 0.171 to 0.186 mm. long, or up to about $1\frac{1}{2} \times$ second joint of hind tarsus, and with 2—5 secondary hairs. Abdomen with sclerotic bands across tergites 6—8 inclusive, otherwise with only occasional small spinal scleroites surrounding one or two of the spinal hairs, and the usual intersegmental muscle sclerites. Spinal abdominal hairs, apart from those of the eighth and perhaps seventh tergite, very short and blunt, those of the third tergite being maximally 5 μ to 9 μ long, or from 0.25 to 0.45 (mean 0.33) \times articular diameter of ant. III. Siphunculi of moderate length, tapering from a somewhat expanded base to the apex, which is rather distinctly flanged; imbrication normal. Cauda typically escutcheon-shaped, from a little less to a little more than half length of siphunculi, and with 5—7 hairs. Marginal tubercles normally present on all segments from pronotum to abd. 7, rather large and flat, those on thoracic segments frequently, and on abdominal segments rarely, divided or duplicated. Eighth abdominal tergite with 3—7 acute but not very finely produced hairs, of maximal length 32—60 μ . Subgenital plate with 2—6 hairs on anterior half and 14—23 forming the irregularly double posterior marginal series. First joints of tarsi with 3, 3, 2 hairs. For measurements of specimens see Table 1.

Alate viviparous female. Described from 2 specimens. Body 2.14 and 2.20 mm. long. General morphology typical of *Dysaphis sensu stricto*. Antennae somewhat more than half body length, processus terminalis 3.6 to 3.8 times basal part of VI. Secondary rhinaria rather protuberant, present on ant. III to V inclusive: III with 42—51, IV with 15—20, V with 2—3. Hairs on III maximally 20 μ long, or 0.71 times articular diameter of joint. Abdominal dorsum with sclerotic dark bars across the spinal half of tergites 3—8 inclusive; those on 3, 7 and 8 free, those on 4—6 fused together at their lateral extremities to form a small, rounded and much broken mid-dorsal macula. Marginal tubercles on abd. 2—7 inclusive also situated on well-marked lateral sclerites. Spinal and pleural hairs of abd. 3 short and blunt, 9—10 μ long, or from 0.32 to 0.36 \times articular diameter of ant. III. Siphunculi slightly less than twice cauda, the latter with 6 hairs in both specimens seen. Eighth abdominal tergite with 3—5 hairs of maximal length 56—60 μ . Subgenital plate with 3—5 anterior hairs and 17—18 in the posterior marginal series. In other respects similar to apterous viviparae. For measurements of specimens see Table 1.

Biology, distribution and material studied. The two known samples of this species were collected in Sweden by Dr. F. Ossiannilsson of Uppsala; the first, of two alate and four apterous viviparous females (the type series), was taken on *Angelica archangelica* at Stockholm, 16.vii.1949; the second, of

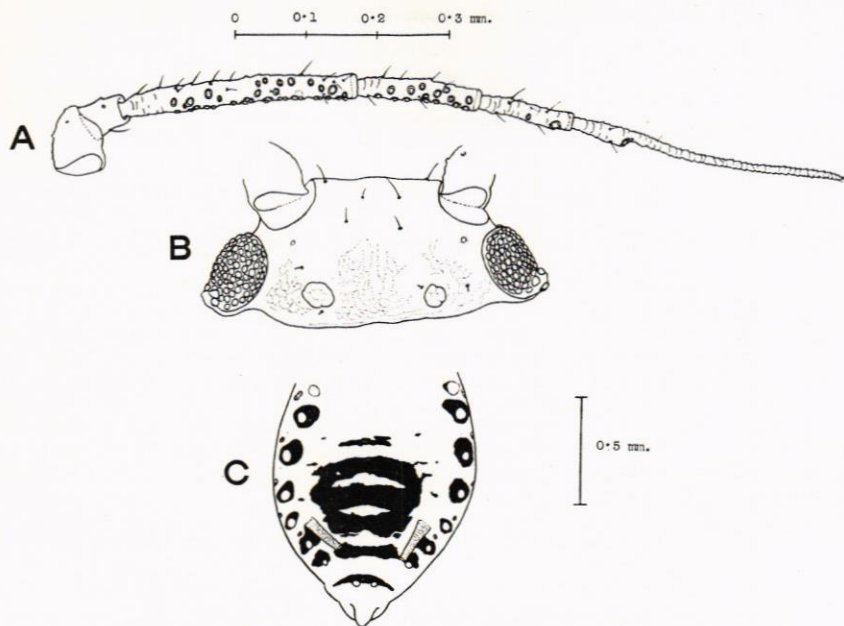


Fig. 1. *Dysaphis ossiannilssoni*, sp.n. A, antenna of apterous viviparous female (holotype); B, head of same (composite drawing, missing hairs drawn in from those of opposite side, except spinal occipitals which are drawn in from other specimens); C, alate viviparous female (morphotype), abdominal pigmentation. A and B to upper scale, C to lower.

eighteen apterous viviparous females, on *Angelica sylvestris* at Vaddö, Utanå, Uppland, 26.vii.1959. In the latter instance the infested plants grew by the seashore. No sexuales or fundatrices have been obtained as yet, but the very close relationship of the species to *D. newskyi* and *D. aizenbergi* makes it very probable that the species will prove to be monoecious and holocyclic on species of *Angelica*.

Notes on the slides of the type series of *D. ossiannilssoni* indicate that the aphids were greenish grey in colour when alive, and were attended by the ant *Lasius niger* L. The type series lived on the root collar of *Angelica archangelica*, while the second collection was made from the leaf bases of *A. sylvestris*.

Taxonomy. The differences between *D. ossiannilssoni* and *D. newskyi* (Börner) are very small, but constant in the material so far seen. They are to some extent parallel to those existing between *D. angelicae* (Koch) and *D. lauberti* (Börner) in the *crataegi* species-group, which use the same pair of Umbelliferous genera as secondary hosts in a heteroecious cycle. Thus in *D. newskyi* the antennal hairs and those of the eighth tergite are to a great extent very acutely produced apically like those of *D. lauberti*; while those of *ossiannilssoni* are more abruptly pointed and on the whole shorter, although the ranges of variation overlap. The same tendency is extended to the posterior cephalic and mid-dorsal body hairs, which are short and blunt

Table 1. Biometric data for specimens of *Dysaphis ossiannilssoni*, sp.n.

Nos. 1—6 from *Angelica archangelica*, Stockholm, 16.vii.49 (No. 4 holotype, No. 1 morpho-
type, Nos. 2, 3, 5 and 6 paratypes);
Nos. 7—12 from *Angelica sylvestris*, Vaddö, Utanå, Sweden, 26.vii.59; F. Ossiannilsson leg.
All lengths measured in millimetres.

Body length	Antennal flagellum	Flagellar joint ratios	Siphunculus	Cauda	Caudal hairs	Ap.rost. segm.	2nd. jt. hd.tars.	Numbers of secondary rhinaria on joints			Morph
								III	IV	V	
2.20	1.24	48:25:18:10+38	0.21	0.11	6	0.165	0.140	42&46	15&19	2&3	al.v.
2.14	1.20	48:23:17:10+36	0.18	0.10	6	0.168	0.136	51&49	21&20	2+&3	>
2.27	1.00	35:21:15:10+31	0.21	0.11	5	0.176	0.141	22&23	12&11	1&—	apt.v.
1.97	1.05	38:20:15:10+35	0.21	0.11	5	0.182	0.133	35&36	11&15	2&1	>
1.89	0.96	34:18:15:10+31	0.21	0.11	5	0.176	0.128	27&27	10&10	2&0	>
2.07	?	35:19:15:9+(broken)	0.20	0.10	5	0.177	—	—&28	—&10	—&1	>
1.84	0.88	30:16:14:10+28	0.22	0.09	5	0.180	0.124	13&15	7&5	0&0	>
1.86	0.79	24:15:13:10+26	0.19	0.10	6	0.186	0.120	5&5	1&3	0&0	>
2.05	0.94	31:17:15:10+32	0.20	0.10	6	0.186	0.132	13&12	3&3	0&0	>
1.97	0.85	28:15:14:10+28	0.20	0.10	5	0.182	0.124	6&7	4&1	0&0	>
1.91	0.98	33:19:16:10+32	0.21	0.10	7	0.180	0.130	19&17	7&8	1&2	>
1.89	0.91	31:17:15:10+29	0.21	0.10	6	0.173	0.127	14&12	3&2	0&0	>

in both species, but consistently more so in *ossiannilssoni* than in *newskyi*. These chaetotactic differences are summarized in Table 2. There is also a small difference in the relative size of the marginal tubercles in the two species; this is most pronounced on abdominal segments 6 and 7, and is an average difference subject to overlap in individual specimens. Data obtained from measurement of the maximum diameter of the tubercles on the pronotum and abd. 1—7 inclusive are summarized in Table 3.

D. aizenbergi (Shaposhnikov) is distinguished from both *newskyi* and *ossiannilssoni* by the fact that not only the dorsal body hairs, but also the

Table 2. Chaetotactic data for *Dysaphis newskyi* (Börner) and *D. ossiannilssoni*, sp.n.

Species	Morph	Origin	Ratio: Longest hairs on ant. III/articular diameter of III			Ratio: Longest hairs on abd. 3T/articular diameter of ant. III		
			Range	Mean	No. of specimens	Range	Mean	No. of specimens
<i>newskyi</i>	apt.	Germany (types)	1.39—1.55	1.47	2	0.65—0.90	0.78	2
		Scotland (7 locs.)	1.15—1.93	1.48	34	0.45—0.73	0.60	33
	al.	Germany (types)	1.00	1.00	2	0.71—0.75	0.73	2
		Scotland (2 locs.)	0.96—1.39	1.13	10	0.46—0.87	0.67	10
<i>ossiannilssoni</i>	apt.	Stockholm (types)	1.12—1.28	1.19	4	0.32—0.33	0.33	4
		Utanå, Sweden	0.91—1.27	1.09	18	0.25—0.45	0.33	18
	al.	Stockholm (types)	0.71	0.71	2	0.32—0.36	0.34	2

Table 3. Marginal tubercle data for *Dysaphis newskyi* (Börner) and *D. ossiannilssoni*, sp.n. a — both sides measured; b — one side only measured; c — both sides measured in 2 specimens; d — 5 sides only measured; e — one specimen only; next smallest value 40.

Species		<i>newskyi</i>			<i>ossiannilssoni</i>	
Origin		Germany (types)	Scotland (1)	Scotland (2)	Sweden (1-types)	Sweden (2)
No. of localities		1	2	5	1	1
No. of specimens		2 ^a	8 ^b	10 ^b	4 ^c	18 ^b
Mean body length (in mm.)		1.75	2.20	2.28	2.05	1.87
Mean of max. diameters of tubercles on indicated tergites (in μ).	Pronotum	59	73	75	98 ^d	69
	Abd. 1	42	46	45	63	47
	2	36	42	46	59	46
	3	29	39	39	56	43
	4	26	36	39	57	40
	5	28	31	37	51	39
	6	15	21	15	46	32
	7	19	19	23	35	30
Mean tubercle diam. per individual (range) for all tub. on one or both sides. (in μ)		30—34	31—47	32—49	49—66	25 ^e —51

antennal and frontal hairs, are short and blunt; those on ant. III are maximally 8—10 μ long, or from 0.35 to 0.43 \times articular diameter of III, in apterae.

Alatae of *ossiannilssoni* so far seen can be separated from those of *newskyi* by a similar relationship of hair lengths on antennae and mid-abdominal tergites (see Table 2), and by a much less extensive dorsal abdominal pigmented pattern (see Fig. 1 C).

A key to apterous viviparae of the *newskyi* group may be drawn up as follows:

- 1 (4) Hairs on third antennal joint maximally more than 9/10 of articular diameter of joint in length.
- 2 (3) Spinal and pleural hairs of third abdominal tergite maximally 5—9 μ long, or from 0.25 to 0.45 of articular diameter of ant. III. Median occipital hairs 8—10 μ long, almost cylindrical with rounded apices. On *Angelica archangelica* and *A. sylvestris* *ossiannilssoni*, sp.n.
- 3 (2) Spinal and pleural hairs of third abdominal tergite maximally 12—20 μ long, or from 0.45 to 0.90 of articular diameter of ant. III. Median occipital hairs 12—25 μ long, usually with distinctly tapered shafts and blunt apices. On *Heracleum austriacum* and *H. sphondylium* *newskyi* (Börner).
- 4 (1) Hairs on third antennal joint maximally less than half articular diameter of joint in length. On *Heracleum sibiricum*. *aizenbergi* (Shaposhn.)

The status to be allotted to these three very closely related forms poses a problem. Chaetotactically *D. aizenbergi* is less closely related to *newskyi* than is the latter to *ossiannilssoni*; but biologically the last-named is the most isolated member of the group, since both *newskyi* and *aizenbergi* live on *Heracleum* species. This may perhaps be regarded as an ecological manifestation of the phenomenon that pairs of sympatric species often differ more

from one another than pairs of allopatric species. Specific discriminants in the genus *Dysaphis* tend to be very small, and in as much as the mutual isolation of *newskyi* and *ossiannilssoni* is virtually complete (*newskyi* is certainly, and *ossiannilssoni* probably, monoecious, and the species are not as yet known to cross-infest each other's host plants), the degree of divergence between them is probably not less than that between *D. lauberti* and *D. angelicae*, which share a common primary host and are therefore not spatially isolated at the time when gamic reproduction occurs. On the other hand the selection pressures operating against hybridity in the complex of species on *Crataegus* (Stroyan, 1958) will not be relevant in the case of *newskyi* and *ossiannilssoni*; so until it is possible to perform experiments in crossing the two taxa it is not possible to decide what degree of genetic isolation has so far evolved between them. For the present, however, I believe it is justifiable to describe *ossiannilssoni* as a full species rather than as a subspecies of *newskyi*, since the true criterion should be the potentialities for natural cross-mating, and these would seem likely to be negligible.

Type material. The Holotype (apterous viviparous female) and Morphotype (alate viviparous female), together with one alate and three apterous paratypes, are in the collection of Dr. F. Ossiannilsson of Uppsala, Sweden, to whom I am deeply indebted for the opportunity to study and describe the material, and to whom the species is dedicated. The type locality is the Bergian Garden, Stockholm, Sweden; the type host is *Angelica archangelica*.

References

- BÖRNER, C., 1940. Neue Blattläuse aus Mitteleuropa. Selbstverlag des Verfassers, Naumburg.
— 1952. Europae centralis Aphides. Mitt. Thüring. bot. Ges., Beiheft 3, 101.
SHAPOSHNIKOV, G. CH., 1949. O polnotsiklych kormovykh svyazyach tlei roda *Yezabura* (*Aphidoidea*) s travyanistoi rastitel'nostiü. Dokl. Akad. Nauk S.S.S.R., 68, 765—8.
STROYAN, H. L. G., 1952. Three New Species of British Aphids. Proc. R. ent. Soc. Lond. (B), 21, 117—20, Fig. 1.
— 1958. A Contribution to the Taxonomy of some British species of *Sappaphis* Matsu-
mura, 1918. J. Linn. Soc. Lond. (Zoology), 43, 644—713.