

Nebria brevicollis (Fabr.) and allied species in Western Europe (Coleoptera, Carabidae)

by

J. VAN DER LAND

(Rijksmuseum van Natuurlijke Historie, Leiden)

Within the subgenus *Nebria* s.str. a small group of very closely related species is formed by *Nebria brevicollis* (Fabr.), *N. andalusia* Ramb. and *N. salina* Fairm. & Laboulb. Some difference of opinion exists among coleopterists about the separation of these species and notably about the differential characters. FIORI (1913) considered *N. andalusia* to be a form of *N. brevicollis*; other authors (e.g., MEYER, 1919 and EVERTS, 1922) considered *N. salina* (or *N. klinckowströmi* as they named the form) and *N. brevicollis* to be conspecific.

I had the opportunity to study a large number of specimens of *N. brevicollis* and *N. salina*, and fifteen specimens of *N. andalusia*, in the Rijksmuseum van Natuurlijke Historie, Leiden. The present paper is a report upon the results of the examination of this material. A large number of specimens from other collections was identified.

Several differential characters between *N. brevicollis*, *N. salina* and *N. andalusia* were given by various authors. Two of these characters (*viz.*, the microsculpture of the elytra and the dorsal pubescence of the hind tarsi) appear to be correlated, and a third feature (the shape of the aedeagus) usually confirms the distinction based on the other two characters.

The three characters mentioned above were used to distinguish between the three forms in the material studied. The variation in these and some other characters will be discussed under separate headings.

C O L O U R. According to JEANNEL (1941) the margin of the pronotum is brown in many specimens of *N. salina*. This is also true for the present material, but the same can be said of *N. brevicollis*, so this character does not differentiate the two species.

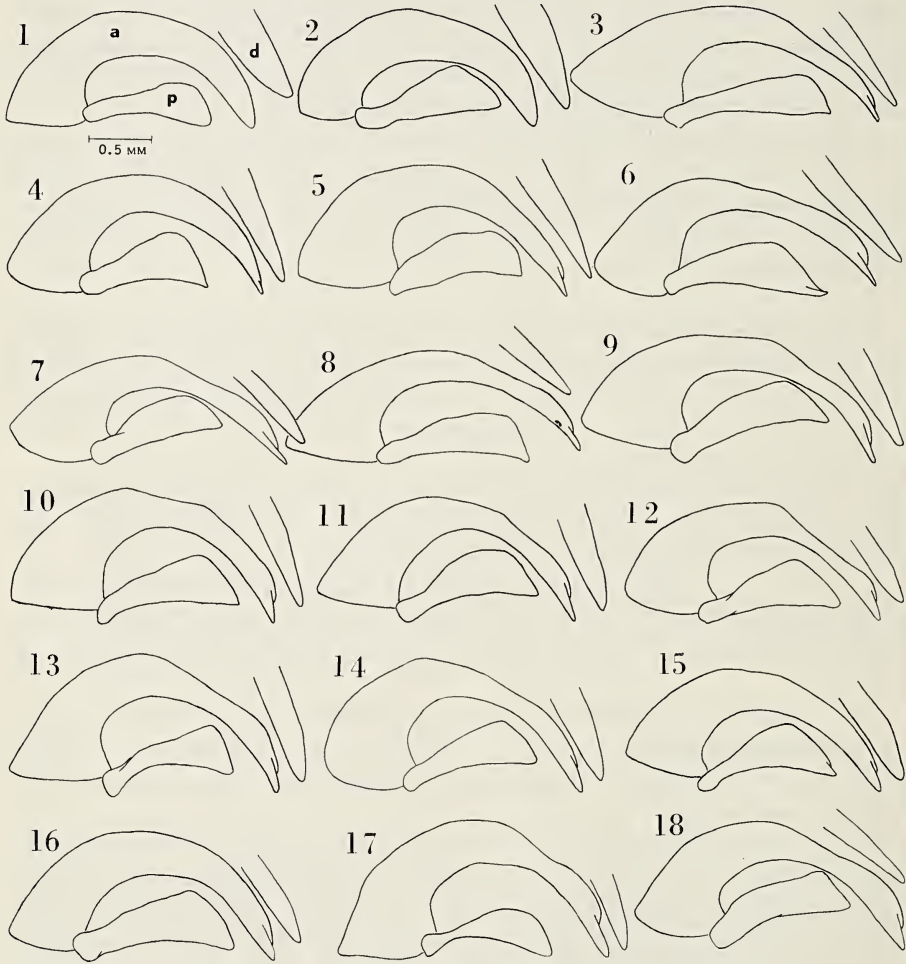
As mentioned by ROSZKOTHEN (1931) and HORION (1935) the first segment of the maxillary palpi in *N. salina* is distinctly darker than the other segments whereas in *N. brevicollis* all segments are equally brown. This character holds good in many specimens.

P r o t h o r a x. BÄNNINGER (1922) showed that the shape of the prothorax is quite variable in *N. brevicollis* and *N. salina*. In most specimens of *N. salina* the lateral margins are slightly larger than in *N. brevicollis*. MROZEK-DAHL (1928) states that the base is as long as the lateral side in *N. salina*, and in *N. brevicollis* the base is longer than the lateral side: 2.6 : 2.2. In my material the base is distinctly longer than the lateral side in both species. Not even a statistical difference could be found. The variation is illustrated in figs. 20 and 22.

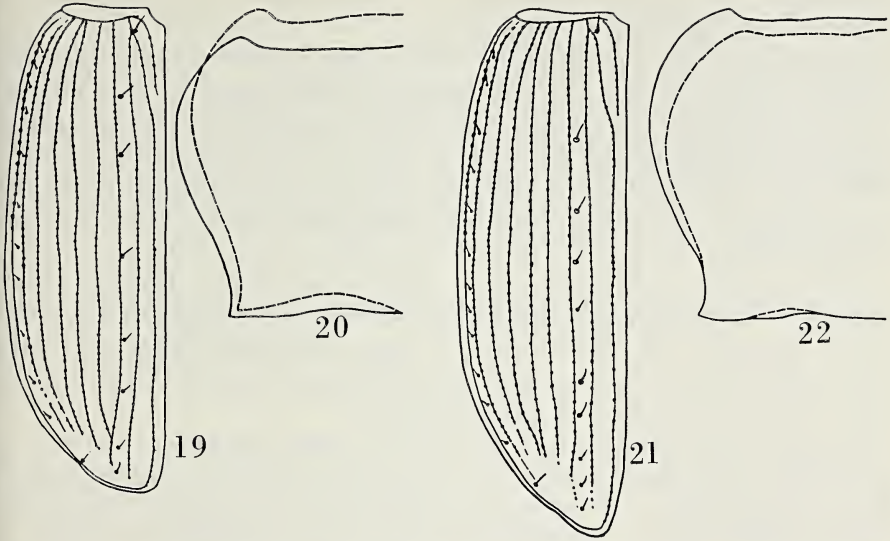
E l y t r a. MUNSTER (1918) and BÄNNINGER (1922) were the first to mention the microsculpture of the elytra as a differential character between the three forms. The microsculpture of the elytra of *N. brevicollis* is strongly transverse.

The microsculpture in *N. salina* and *N. andalusia* is isodiametric. Although in some specimens of *N. salina* the meshes of the reticulation are moderately transverse they can still be distinguished from *N. brevicollis*. Moreover, the reticulation in *N. brevicollis* is finer.

According to MjÖBERG (1915), MUNSTER (1918), EVERTS (1922) and HORION (1935) the lateral sides of the elytra run parallel for the greater part in *N. salina*, while they are regularly curved in *N. brevicollis*. I find the species rather variable in this character which appears to be of no use in separating the two forms.



Figs. 1—18. Male genitalia (lateral view of aedeagus(a) and right paramere(p), dorsal view of distal part of aedeagus(d)): 1, 2 *Nebria andalusia* (1, Sicilia; 2, Algeria); 3—9 *Nebria salina* (3, Cadiz, Spain; 4, Algarve, Spain; 5, Asturia, Spain; 6, Maastricht, Netherlands; 7, 8, Worth-Rheden, Netherlands; 9, Westerbork, Netherlands); 10—18 *Nebria brevicollis* (10, Corse; 11, 12, Navarra, Spain; 13, Tirol, Austria; 14, Aywaille, Belgium; 15, Santpoort, Netherlands; 16—18, Leiden, Netherlands).



Figs. 19, 21. Left elytron; 19 *Nebria salina* (Luxembourg); 21 *Nebria brevicollis* (Leiden, Netherlands). Figs. 20, 22. Left part of prothorax of two specimens; 20 *Nebria salina* (Maastricht, Netherlands); 22 *Nebria brevicollis* (continuous line: Hilversum, Netherlands; broken line: Barneveld, Netherlands).

The same authors mentioned the fact that the striation and the punctation are much finer in *N. salina* than in *N. brevicollis*. In most instances this is indeed quite distinct when two specimens are directly compared (figs. 19, 21), but this relative difference is rather difficult to use on its own.

According to WEST (1930), in nearly all specimens of *N. salina* from the Faroes the third and fourth striae are combined near the apex. Many specimens from other localities also show this character (fig. 19) or they have the 4th stria nearly reaching the 3rd; in the majority of specimens, however, this is not the case.

The setiferous punctures are rather variable in place and number. For instance, the number of punctures in the third interval varies from six to nine. Perhaps a statistical difference between *N. brevicollis* and *N. salina* could be found: the highest number was only found in specimens of the former species (fig. 21), the latter species having eight punctures at most. *N. salina* has nearly always two pores near the apex (fig. 19), *N. brevicollis* often bears three pores in that part of the interval (fig. 21).

Hind tarsus. One of the most marked differences between *N. brevicollis* and *N. andalusia* on the one hand and *N. salina* on the other is that in the first-mentioned species the dorsal surfaces of the tarsi of the hind legs are distinctly hirsute, whereas this is not the case in *N. salina*, except for the two distal hairs on the fifth segment. BÄNNINGER (1922) found pores without hairs on the upper surface of the hind tarsi in some specimens of *N. salina* and GERSDORF (1937) even found some hairs in a number of specimens. Up till now no other

intermediate forms have been described, so these dorsal hairs can still be considered a good discriminating character.

A e d e a g u s. The male genitalia of the species of *Nebria* are quite simple, without any hairs or spines on the external parts. Consequently the only differences to be expected are differences in the relative proportions of the aedeagus or parameres. The aedeagus of *N. andalusia* (figs. 1, 2) is regularly arcuate and rather short. The distal part is blunt and does not end in a separate apex. By this character *N. andalusia* can easily be distinguished from both *N. brevicollis* and *N. salina*.

Various authors (MUNSTER, 1918; BÄNNINGER, 1922; HORION, 1935; JEANNEL, 1941) have mentioned the difference between the aedeagi of *N. salina* and *N. brevicollis*. BÄNNINGER (1922) found intermediate forms, and WEST (1930) stated that he could not find distinct differences. JEANNEL (1941) gives a figure of the male genitalia of *N. brevicollis*.

In general, the aedeagus of *N. brevicollis* is rather regularly arcuate and its apex is not much depressed (figs. 11—15), or it is round (figs. 10, 16, 17) or even compressed (fig. 18). In most specimens of *N. salina* the aedeagus does not form such a regular arc and the distal part is more stretched out (figs. 3, 6—9). There are, however, some exceptions (figs. 4, 5). In a few specimens of *N. salina* the aedeagus (fig. 5) cannot be distinguished from that of *N. brevicollis*. In all specimens the apex is small and depressed.

L e n g t h. According to JEANNEL (1941) the specimens of *N. salina* are smaller than those of *N. brevicollis*. In 75 specimens of both species, I measured the distance between the mandibles and the apex of the elytra. The result shown in fig. 23 does not confirm the statement of JEANNEL.

E c o l o g y. *N. brevicollis* occurs especially in rather moist, humous, and usually wooded habitats (gardens and parks included). It is *not* found in very dry loca-



Fig. 23. Length frequency curves of 75 specimens; continuous line: *Nebria salina*, broken line: *Nebria brevicollis*, abscis: length in mm, ordinate: number of specimens.

lities, neither in very humid biotopes, nor in exposed situations. *N. salina* occurs in the same biotopes as *N. brevicollis* (Germany: MROZEK-DAHL 1928, GERSDORF 1937; France: JEANNEL 1941; Netherlands), but it is also found in exposed biotopes such as moors, especially in northern countries (Denmark: LARSSON 1939; Sweden: LINDROTH 1945; the Faroes: WEST 1930; but also in Wales: GILBERT 1958; Netherlands; Germany: LINDROTH 1945). Besides, as its name indicates, it was found on saline soils in France (JEANNEL, 1941) and The Netherlands, but this is not a very common habitat.

As far as could be traced nothing has been published on the habitats of these beetles in Southern Europe.

We may conclude that the ecological amplitude of *N. salina* is much larger than that of *N. brevicollis*.

KEY TO SPECIES

- a. Upper surface of hind tarsi hirsute. Microsculpture of elytra isodiametric. Aedeagus regularly arcuate, distal part blunt, not with separate apex. Lateral margins of prothorax larger than in *N. brevicollis* . . . *N. andalusia* Ramb.
- b. Upper surface of hind tarsi hirsute. Microsculpture of elytra strongly transverse. Aedeagus regularly arcuate, distal part tapering and with separate apex which is not much depressed. Lateral margins of prothorax narrow. Striation and punctation of elytra not so fine as in *N. salina*, 3rd and 4th striae not combined. First segment of maxillary palpi of same colour as other segments
. *N. brevicollis* (Fabr.)
- c. Upper surface of hind tarsi smooth or with some hairs. Microsculpture of elytra isodiametric, in some specimens moderately transverse. Distal part of aedeagus stretched out, tapering and with a small, depressed separate apex. Lateral margins of prothorax larger than in *N. brevicollis*. Striation and punctation of elytra fine, 3rd and 4th striae sometimes combined or nearly combined near apex. First segment of maxillary palpi darker than other segments
. *N. salina* Fairm. & Laboulb.

C o n c l u s i o n. The opinion of BÄNNINGER (1922) that *N. andalusia* is not a form of *N. brevicollis* or *N. salina* is supported by the fact that the shape of the aedeagus is markedly different.

It is possible to distinguish all specimens of *N. salina* and *N. brevicollis* and true intermediate forms have never been described, though mixed populations often occur. No doubt they are good species and for the time being one may suppose that they are genetically separated.

As the areas of all three species overlap it is not possible to consider any of them to be a subspecies.

References

- BÄNNINGER, M., 1922, Über *Nebria* (*Helobia*) *brevicollis* F. und *iberica* Oliveira. *Ent. Blätt.* 18 : 77-83.
- EVERTS, E., 1922, Coleoptera Neerlandica, vol. 3, 's-Gravenhage.
- FIORI, A. 1913, [*Nebria brevicollis* e *N. andalusia*]. *Riv. Col. Ital.* 11 : 195.

- GERSDORF, E., 1937, Ökologisch-faunistische Untersuchungen über die Carabiden der mecklenburgischen Landschaft. *Zool. Jabrb. (Syst.)* 70 : 17—86.
 GILBERT, O., 1958, The life history patterns of *Nebria degenerata* Schauffuss and *N. brevicollis* (Fabricius) (Coleoptera, Carabidae). *J. Soc. Brit. Ent.* 6 : 11—14.
 HORION, A., 1935, Nachtrag zu Fauna Germanica, Krefeld.
 JEANNEL, R., 1941, Coléoptères Carabiques, *Faune de France* 39, Paris.
 LARSSON, S. G., 1939, Entwicklungstypen und Entwicklungszeiten der dänischen Carabiden. *Ent. Medd.* 20 : 277—560.
 LINDROTH, C. H., 1945, Die fennoskandischen Carabidae 1 spezieller Teil. *Meddel. Göt. Mus. Zool. Avd.* 109.
 MEYER, P., 1919, Ist nicht *Nebria klinckowströmi* Mjöberg nur eine Varietät von *N. brevicollis* F.? *Ent. Blätt.* 15.
 MJÖBERG, E., 1915, *Nebria Klinckowströmi* n. sp. *Ent. Tidskr.* 36 : 285.
 MROZEK-DAHL, T., 1928, Coleoptera oder Käfer, vol. 1 Carabidae (Laufkäfer). *Die Tierw. Deutschl.* 7, Jena.
 MUNSTER, Th., 1918, *Nebria brevicollis* Fbr. og naerstaende arter. *Forhandl. ved. 16. skand. naturforskermøte, Kristiania* : 701—706.
 ROSZKOTHEN, 1931, [*Nebria brevicollis* und *degenerata* Schauf.]. *Ent. Blätt.* 27 : 47.
 WEST, A., 1930, Coleoptera, *The Zoology of the Faroes* 2 (1), København.

Three new species of *Cinara*, together with a preliminary list of the species of this genus known from Alaska (Aphididae, Homoptera)

by

F. C. HOTTES

Cinara alaskana, n.sp.

APTEROUS VIVIPAROUS FEMALE. — Length from vertex to end of cauda 2.20 mm.

Head. — Width across eyes 0.82 mm. Color of head dusky brown. Median transverse suture indistinct. Antennal segment III pale dusky, segment IV dusky towards apex, segment V almost uniformly dusky, segment VI dusky throughout. Lengths of antennal segments as follows: III: 0.58; IV: 0.20; V: 0.26; VI: 0.17 + 0.02 mm. Antennal segment III without sensoria; segment IV in holotype with one small secondary sensorium, in paratype specimens without sensoria; segment V with only a primary sensorium. Hairs on antennal segment III more numerous and much longer on anterior margin of segment than on posterior margin, upstanding, varying in length from 0.08—0.10 mm. Unguis short but pointed. Eyes small, shallow; ocular tubercles present, but poorly developed, and easily overlooked. Hairs on dorsum of head numerous, but not present along posterior margin, varying from 0.9 to 0.11 mm in length. Rostral segments 2, 3, 4 and 5 combined 1.98 mm in length; last three segments of the rostrum 0.30, 0.24 and 0.05 mm long. Hairs on fourth rostral segment confined to either side of groove.

Thorax. — Mesosternal tubercle lacking. Lengths of pro-, meso- and metathoracic femora as follows: 1.05, 0.99 and 1.47 mm. Lengths of pro-, meso- and metathoracic tibiae as follows: 1.42, 1.50 and 2.32 mm. First metatarsal segment 0.13 mm, second metatarsal segment 0.32 mm. Hairs on metathoracic tibiae numerous, set at an angle of about sixty degrees, on outer margin in length varying