

# The Dutch species of *Borkhausenia*, with *B. nefrax* as an addition to the Dutch list (Lepidoptera: Oecophoridae)

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*Abstract:* Of the six species of *Borkhausenia* reported from Europe four are now known from The Netherlands. Identification keys to the Dutch species are presented, based on external characters and genitalia as well. Moreover, biology and faunistics are discussed. Special attention is paid to *Borkhausenia nefrax*, a species previously unrecorded in this country.

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## Introduction

The oecophorid genus *Borkhausenia* is a relatively small genus which occurs in the Holarctic and Neotropical regions. Formerly *Borkhausenia* was a large collective genus of which Rebel (1901) listed fifty-four species for Europe. The subsequent splitting up of the genus reduced the number of European species to six of which four are now known from The Netherlands. Only one species is found in the Nearctic region.

The adult moths are rather small: the wingspan of the Dutch species ranges from 8.0 to 15.0 mm. The colouration of the forewing is predominantly brown and yellowish grey. Adults of most species superficially remind of tineid-moths, such as *Niditinea*, the more so as *Borkhausenia*-species are also generally found in and around houses. The structure of the genitalia shows similarity to those of the oecophorid genera *Hofmannophila* and *Endrosis* and both genera can be considered as related to *Borkhausenia*.

Up to twenty-five years ago only two species of *Borkhausenia* s.str. were reported from The Netherlands, viz. *B. fuscescens* and *B. minutella* (De Graaf & Snellen, 1866; Lempke,

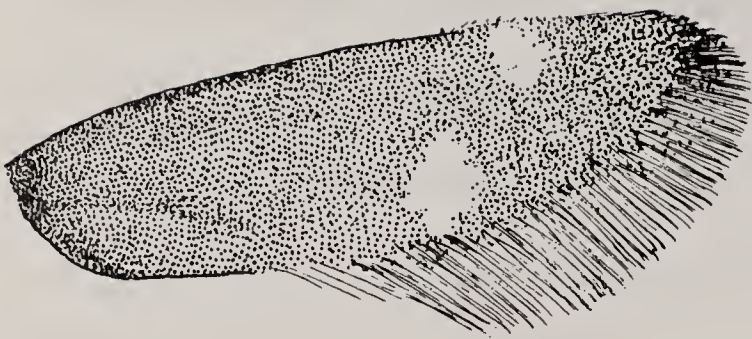
1976). Langohr collected a third species in the province of Limburg in 1972: *Borkhausenia luridicomella* (Kuchlein, 1993). Confusion among the Dutch species of *Borkhausenia* arose from the time that light coloured specimens were found in The Netherlands. The latter specimens were tentatively identified as *B. luridicomella*, and as such mentioned in a note in "De kleine vlinders" added after completion of the manuscript (Kuchlein, 1993). Afterwards we had the opportunity to compare series of *B. luridicomella* with the above mentioned yellowish specimens, and we came to the conclusion that we had to do with two different species, viz. the true *B. luridicomella*, and a lighter coloured species, previously not recorded from Northwest Europe: *B. nefrax*.

From literature it appears that also abroad identification problems arose with the species of *Borkhausenia*. All this certainly justifies a short discussion of the Dutch representatives of this genus.

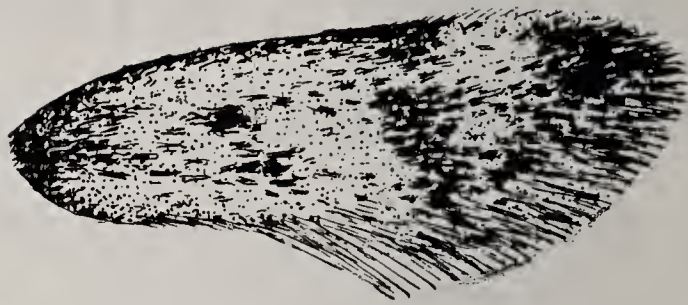
## List of the Dutch species of *Borkhausenia* Hübner

The numbering of the species is in accordance with the Dutch checklist (Kuchlein, 1993).

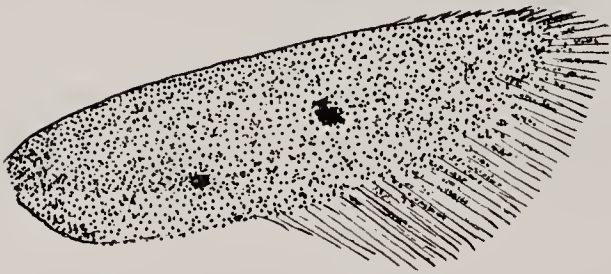




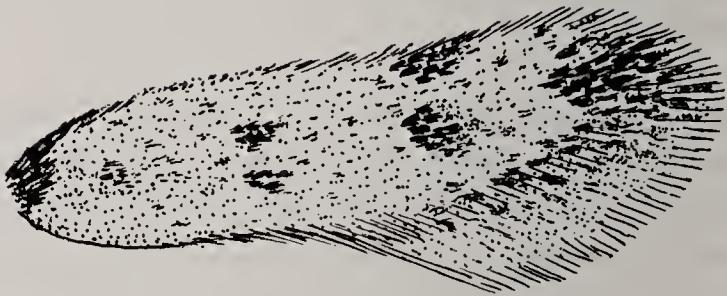
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Fig. 1-4. Forewing of *Borkhausenia*-species. 1, *B. minutella*; 2, *B. fuscescens*; 3, *B. luridicomella*; 4, *B. nefrax*.

- 431a *Borkhausenia nefrax* Hodges, 1974  
= *oecophila* sensu auct. nec Staudinger (1876)
- 432 *Borkhausenia fuscescens* (Haworth, 1828)
- 433 *Borkhausenia luridicomella* (Herrich-Schäffer, 1856)
- 434 *Borkhausenia minutella* (Linnaeus, 1758)

Two more species of *Borkhausenia* are known from Europe, viz. *B. gredoensis* Rebel and *B. predotai* Hartig. Both species are endemic for Spain.

Identification

In the genus *Borkhausenia* confusion and misidentifications seem to be the order of the day. In Denmark, for instance, *B. luridicomella* was mistaken for *B. fuscescens* (Palm, 1989). However, the identification of *B. nefrax* presented most of the problems. In North America this species was mistaken for *B. fuscescens* until Hodges (1974) recognized

and described it as a distinct species. In France *B. nefrax* was named *Oecia oecophila* (Staudinger) until Minet (1978) established its true identity. Finally, the Dutch specimens of *B. nefrax* were initially named *Borkhausenia luridicomella*. None the less, correct identification of the *Borkhausenia*-species needs not to offer problems as appears from the following keys.

Key based on external characters

- 1 Forewing unicolourous dark brown without fuscous stigmata, but with a traverse ochreous-yellow tornal spot, and a smaller one on costa at three-quarters (fig. 1) .....  
..... *B. minutella*  
May to early August. Wingspan 9.5 - 14.0 mm.
- Forewing with ground colour brownish or yellowish with fuscous markings (fig. 2 - 4) ..... 2
- 2 Forewing with ground colour brown or greyish-brown ..... 3
- Forewing with ground colour greyish-yellow or yellowish ..... 4



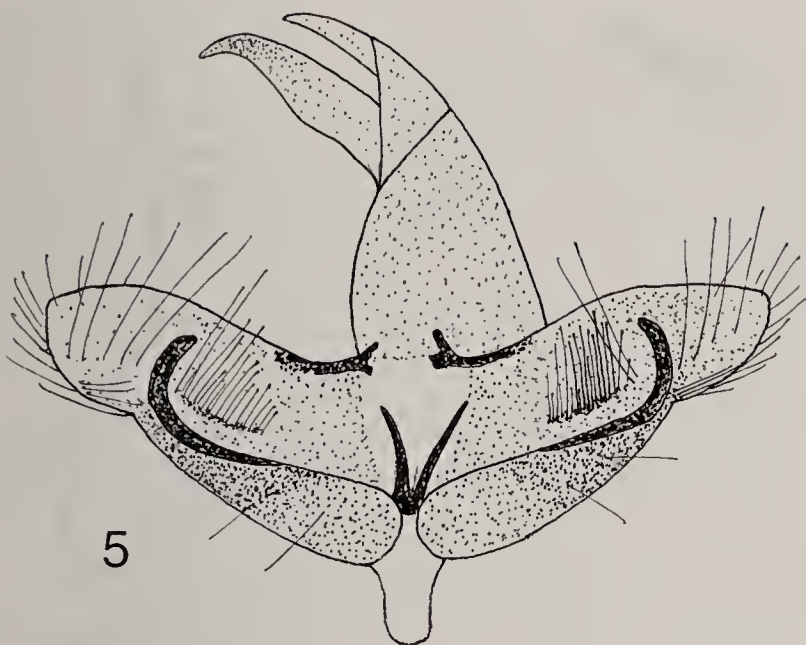


Fig. 5. Male genitalia of *Borkhansenia nefrax*.

- 3 Vertex dark grey-brown ..... *B. fuscescens* (part)  
Late May to early September (outdoors). Wing-span 7.5 - 11.5 mm. Forewing brown with three ill-defined blackish-brown stigmata (one discal and two before the middle of the wing) and dark suffusion, especially in the apical part (fig. 2).
- Vertex ochreous - yellow .. *B. luridicomella*  
Early June to mid July. Wingspan 9.0 - 13.0 mm. Forewing brownish-grey with one dark brown discal stigma and two before the middle of the wing (fig. 3).
- 4 Hindtibia with medial pair of spurs at about three-fifth..... *B. nefrax*  
Throughout the year (indoors). Wingspan 9.0 - 13.0 mm (male), 12.0 - 14.5 mm (female). In hindtibia the length of the longest medial spur half so long as distance from base of tibia to insertion of medial spurs. Forewing greyish-yellow with a brown discal stigma and the two stigmata before the middle indistinct or lacking; in the apical area some brown suffusion (fig. 4).
- Hindtibia with medial pair of spurs about half-way ..... *B. fuscescens* (part)  
A very rare light-coloured form. In hindtibia the length of the longest medial spur approximately the same as from base of tibia to insertion of the spurs.

Key based on male genitalia

- 1 In valva process of sacculus blunt at apex (fig. 5). Aedeagus without cornuti (fig. 9) ..  
..... *B. nefrax*  
Apex of valva more rounded than in the other species.

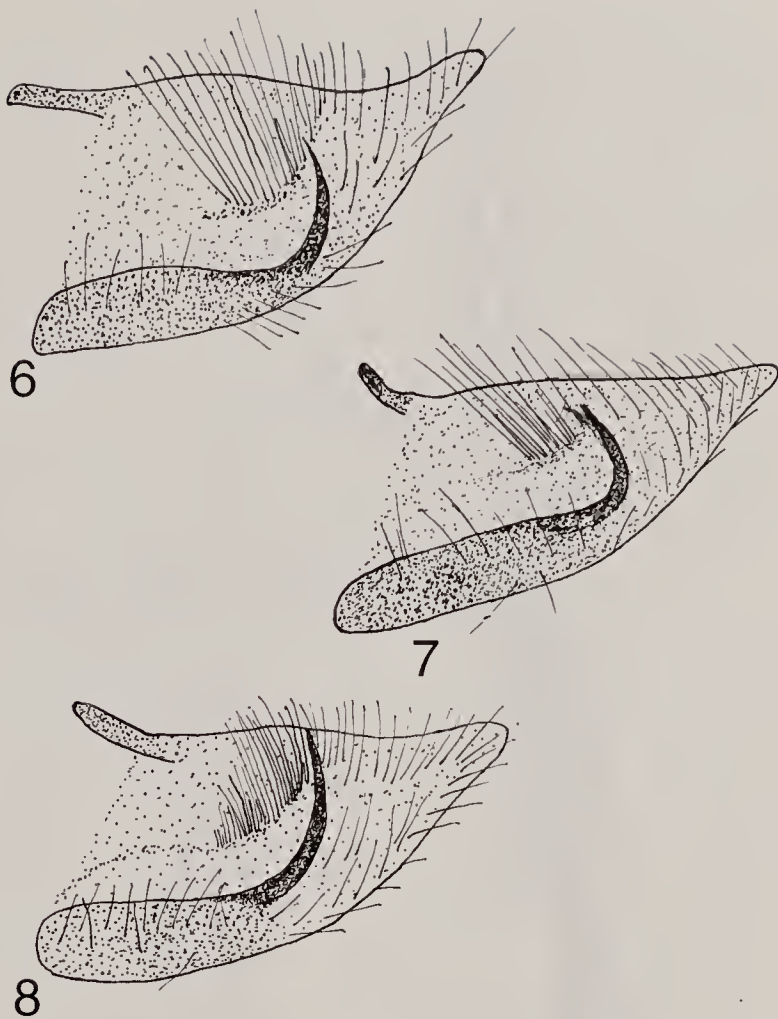


Fig. 6-8. Valva of *Borkhansenia*-species. 6, *B. luridicomella*; 7, *B. fuscescens*; 8, *B. minutella*.

- In valva process of sacculus pointed at apex (fig. 6 - 8). Aedeagus with one or more cornuti (fig. 10 - 12) ..... 2
- 2 Aedeagus in apical part with one well-developed drawing-pin-shaped cornutus and a row of about fifteen small thorn-shaped cornuti (fig. 6, 10) ..... *B. luridicomella*
- Aedeagus with one well-developed cornutus (fig. 11 - 12).....3
- 3 Aedeagus with an aciform cornutus (fig. 12). In valva the process of sacculus reaching costa (fig. 8)..... *B. minutella*
- Aedeagus with a strongly curved cornutus (fig. 11). In valva the process of sacculus not reaching costa (fig. 7) .... *B. fuscescens*

Key based on female genitalia

- 1 Corpus bursae less than one-fourth length of ductus bursae (fig. 13)..... *B. nefrax*
- Corpus bursae more than one - third length of ductus bursae (fig. 14 - 16) ..... 2
- 2 Apophyses anteriores at least one-fourth shorter than apophyses posteriores (fig. 14) ..... *B. minutella*
- Apophyses anteriores and posteriores of

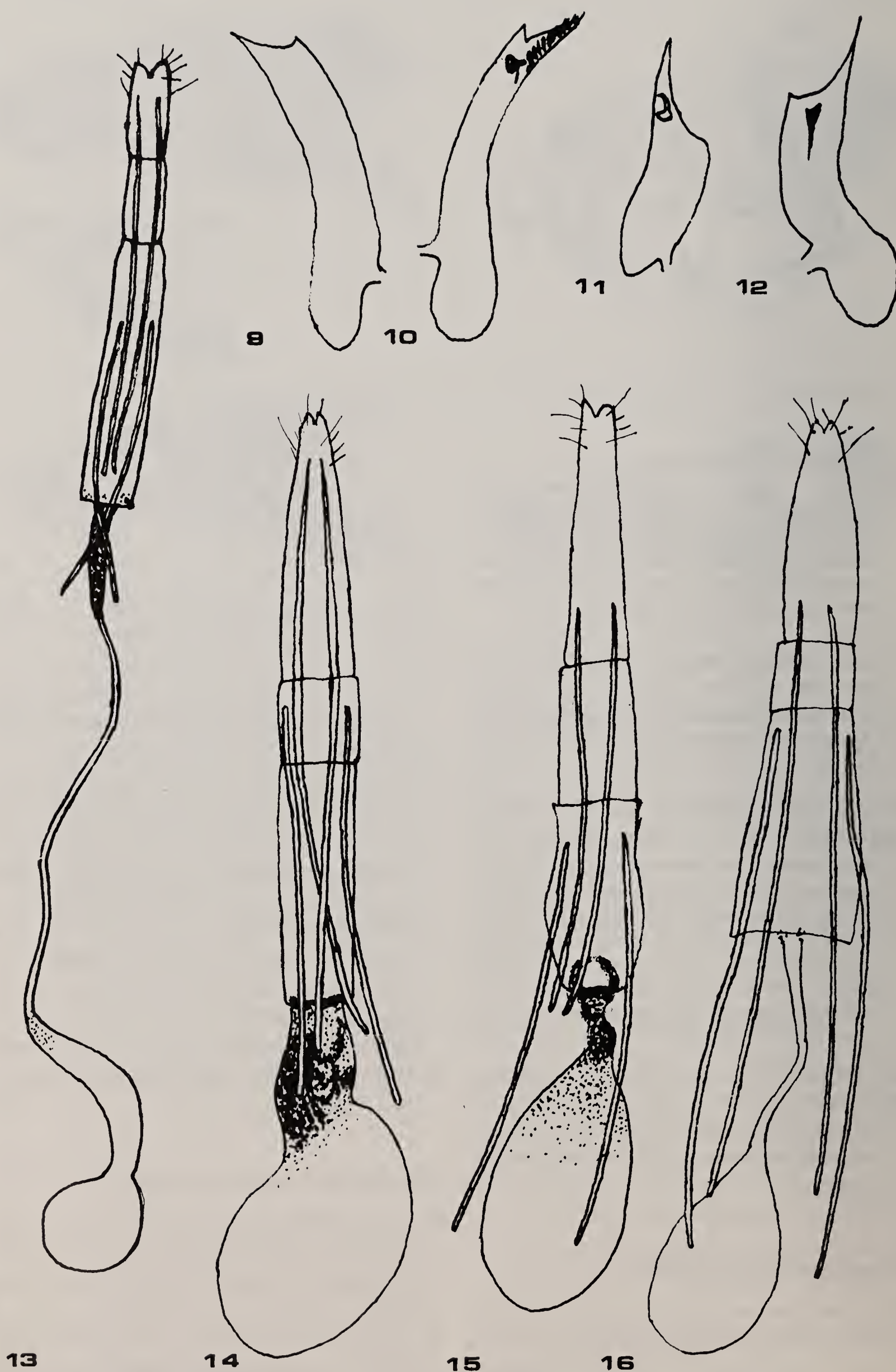
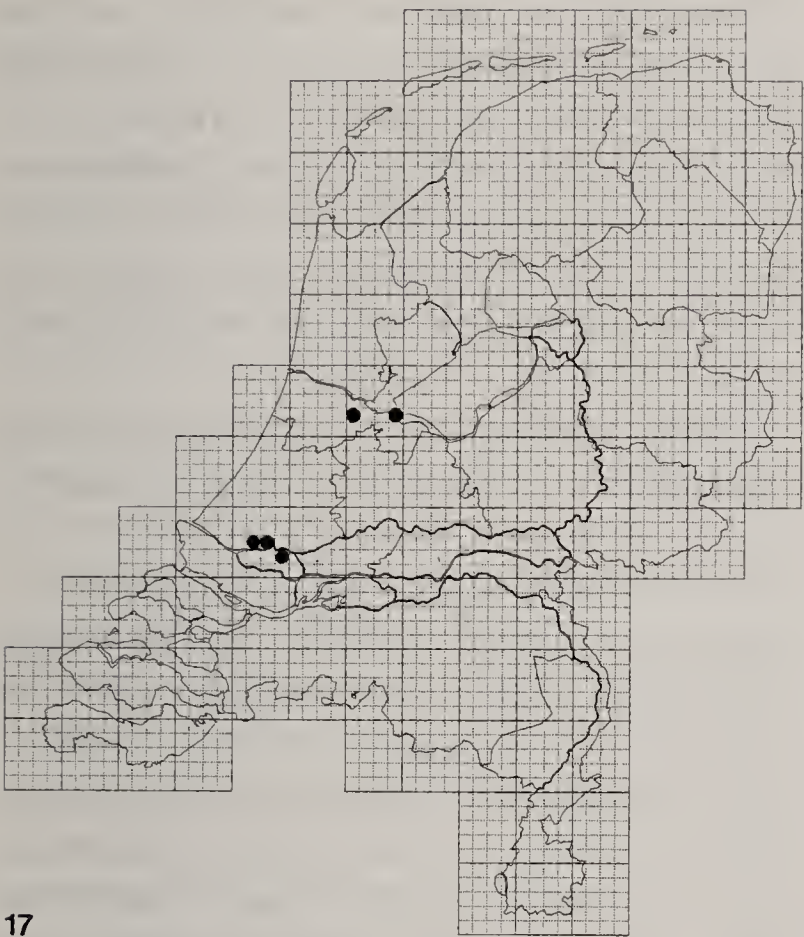
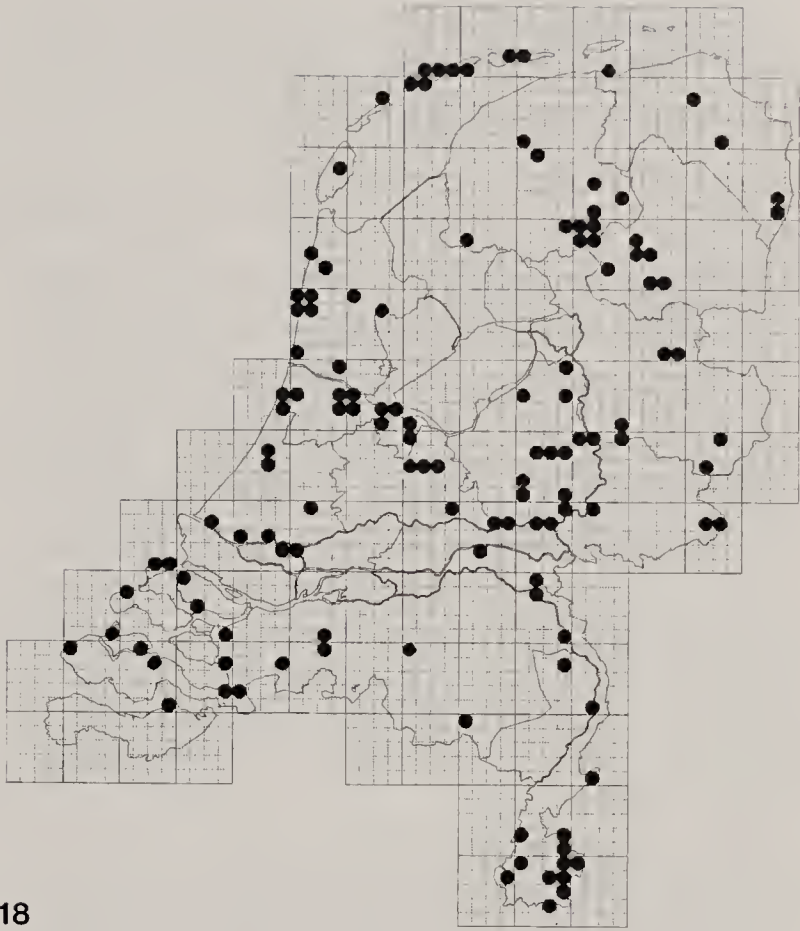


Fig. 9-16. Aedeagus (9-12) and female genitalia (13-16) of *Borkhausenia*-species. 9, 13, *B. nefrax*; 10, 16, *B. luridicomella*; 11, 15, *B. fuscensens*; 12, 14, *B. minutella*.

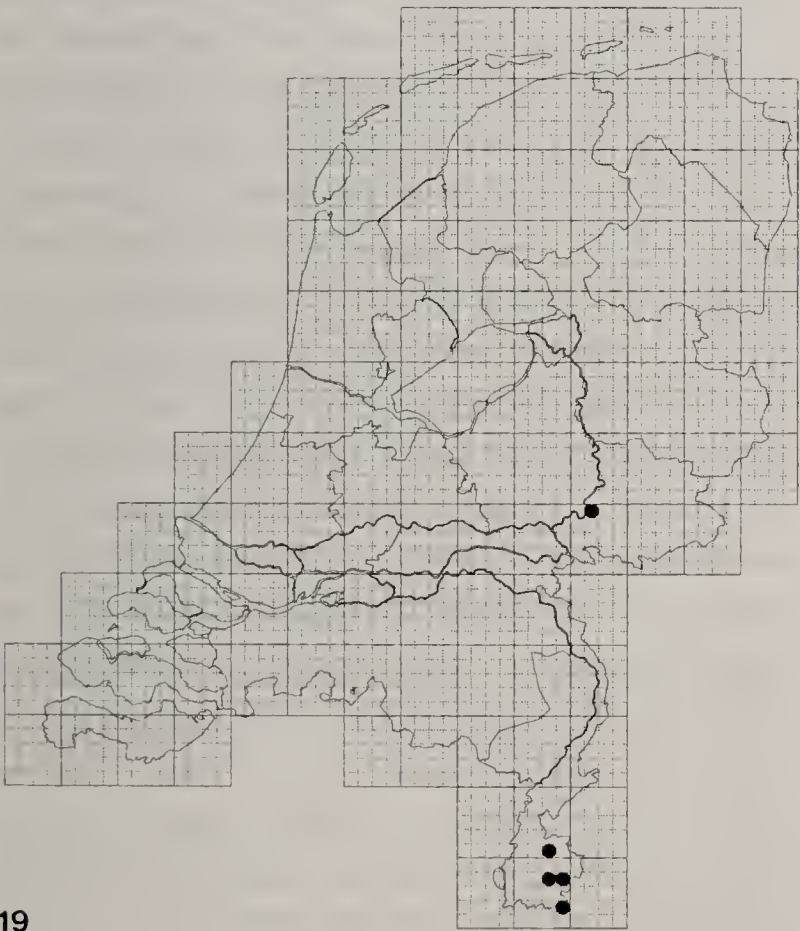




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Fig. 17-20. Distribution-maps of *Borkhausenia*-species. 17, *B. nefrax*; 18, *B. fuscescens*; 19, *B. luridicomella*; 20, *B. minutella*.

- about equal length (fig. 15 - 16)..... 3  
Difference in length of the apophyses less than one - fifth.
- 3 Ostium bursae heavily sclerotized, forming a funnel-shaped structure..... *B. fuscescens*  
– Ostium bursae poorly sclerotized, forming a small, indistinct, slightly curled, square structure (fig. 16)..... *B. luridicomella*

**Bionomics**

Among the Microlepidoptera quite a lot of species are able to establish indoor breeding populations, for instance in houses, stables, storage accommodations and other man-made buildings. Two Dutch species of *Borkhausenia* belong to this category, viz. *B. nefrax* and



*B. fuscescens*. The latter species is indeed reported from houses, but is far more frequently observed outdoors. On the other hand, the adult moths of *B. luridicomella* are all taken outdoors. This species inhabits above all hedgerows and gardens. *Borkhausenia minutella* shows an interesting ecological phenomenon. In large parts of its geographical range the species can be observed indoors as well as outdoors, though in The Netherlands there is no evidence for its occurrence in houses up to the present. However, at the edges of its range (perhaps it is better to say: outside the range), *B. minutella* only occurs indoors, for example in Great-Britain and in Scandinavia (Palm, 1989).

The moths generally fly at dusk, but also in the afternoon. Although *B. minutella* is a common species in large parts of The Netherlands it is only occasionally caught by means of mercury-vapour-traps.

Only few data on the early stages of the *Borkhausenia*-species have been published thus far. The larvae generally feed on detritus, such as moldy trash or decaying leaves. They also eat animal debris for the moths were bred from birds' nests were the larvae most probably consumed refuse (Benander, 1928; Hodges, 1974; Emmet, 1988). In addition, the larvae of *B. minutella* are reported to feed on seeds (Snellen, 1882; Emmet, 1988). Eckstein (1933) mentioned *Carpinus* as larval food for *B. luridicomella*, which suggests that the larva eats fresh plant tissue. This is unlikely, but possibly this information refers to decaying leaves of *Carpinus*.

The voltinism of the *Borkhausenia*-species is not clear. *Borkhausenia luridicomella*, *B. minutella* and outdoor-living populations of *B. fuscescens* are uni- or bivoltine, flying from May to August (*B. fuscescens* sometimes to early September). *Borkhausenia nefrax* is multivoltine, and this probably also applies to indoor-living populations of *B. fuscescens*.

### Faunistics

Since the publication of "De kleine vlinders" (Kuchlein, 1993) substantially more faunistic

information has become available on the *Borkhausenia*-species. Moreover, in this book distribution data of *B. luridicomella* and *B. nefrax* have been combined in one distribution map under the name *B. luridicomella*. All this justifies the production of new distribution maps for the Dutch species of *Borkhausenia* (fig. 17-20).

Some faunistic data of importance are mentioned under the individual species treated below.

*Borkhausenia nefrax*. The first Dutch specimen of *B. nefrax* was taken by the second author in the cellar of his house in the northern part of Rotterdam (province of Zuid-Holland) at 12 November 1987. Up to the present he observed hundreds of moths, mostly in the cellar, but also some outdoors, close around the house. However, in the last few years the moths were seen less frequently. Moreover, the first author discovered two specimens in the collection of J. A. W. Lucas under the name *B. fuscescens*. Both specimens were also collected in the Rotterdam area, albeit in different 5 km x 5 km squares, on 10 July 1990 and on 13 September 1990. *Borkhausenia nefrax* is now also known from two other localities in The Netherlands, viz. Amsterdam (province of Noord-Holland) where it was taken by J. H. Donner in the southern part of the town at 20 July 1990, and from Muiderberg (province of Noord-Holland) where A. van Tuijl found two specimens at 26 September 1991 and 23 September 1992 respectively (fig. 17). *Borkhausenia nefrax* is now known from France (Minet, 1978), Spain (Vives Moreno, 1981), The Netherlands and the western part of North America (Hodges, 1974). The American Powell (1964) considered the species (mistaken for *B. fuscescens*) to be an introduction from Europe to the U.S.A., whereas the Frenchman Minet (1978) held the view that *B. nefrax* was introduced from America to France. Their opinions were possibly based on the general human principle that all evil originates from elsewhere. From France *B. nefrax* has already been known since the last century (Minet, 1978), but the oldest record from America mentioned by



Hodges (1974), dates only from 1959. These facts may indicate that the species was introduced in North America from Europe. It is also possible, however, that *B. nefrax* is a real Holarctic species. Anyhow, these events in the past remain subject for speculation until more historical data on the species become available. It is remarkable that so far *B. nefrax* has been observed exclusively in and close around houses. This means that we do not know its original bionomics outside human dwellings.

*Borkhausenien fuscescens*. The most widespread of the Dutch *Borkhausenien*-species, and often common where it occurs (fig. 18).

*Borkhausenien luridicomella*. The first Dutch specimen was taken by Langohr near Holset (province of Limburg) at 14 July 1972 (Kuchlein, 1993). Then four moths were caught by Asselbergs (1984) at Hoensbroek at 7 June 1981. The next two findings are also from Zuid-Limburg: Simpelveld on 8 July 1991 (G. R. Langohr) and Wrakelberg on 19 June 1995 (J. H. Kuchlein). Finally, Ch. G. A. M. Naves captured a male at Drempt (province of Gelderland) in 1995 and, in 1998, five specimens, so far the only records outside Zuid-Limburg (fig. 19). After acceptance of the paper J.B. Wolschrijn communicated one specimen from Twello (province of Gelderland), taken in 1996.

*Borkhausenien minutella*. Widespread in the southern half of The Netherlands, and sometimes common where it occurs. In the other half of the country the species is very local (fig. 20).

## Samenvatting

Van de zes *Borkhausenien*-soorten die voor Europa worden opgegeven, zijn er thans vier uit Nederland bekend. Voor de Nederlandse soorten worden determineertabellen gegeven, gebaseerd op uiterlijke kenmerken en kenmerken van de genitaliën. Bovendien worden biologie en faunistiek besproken. Speciale aandacht wordt geschonken aan *Borkhausenien nefrax*, een soort die als nieuw voor de fauna wordt vermeld.

## Acknowledgements

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