Belgian Journal of Entomology 7 (2005) : *37-43*

A New Zealand endemic *Nysius* established in The Netherlands and Belgium (Heteroptera: Lygaeidae)

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Abstract

Nysius huttoni (Heteroptera: Lygaeidae), an endemic species from New Zealand was found established in the extreme southwest of The Netherlands (province of Zeeland) and the adjacent Belgian provinces of West-Vlaanderen, Oost-Vlaanderen and Brabant. Data on its biology and pest status are summarized from the literature.

Keywords: *Nysius huttoni*, Europe, introduction, invasive pest.

Introduction

Since 2002, an unfamiliar but very remarkable "hairy" species of the genus *Nysius* Dallas, 1852 (Fig. 1) was found at different localities in the extreme southwest of The Netherlands (Province of Zeeland) and the adjacent northwestern part of Belgium (provinces West- and Oost-Vlaanderen and Brabant). The species was not included in the recent monograph of West-Palaearctic Lygaeidae by PÉRICART (1999) and, according to the monograph of Palaearctic species by WAGNER (1958), the species should belong to the formerly recognized subgenus *Anorthuna* STRAND, 1928. The members of this subgenus are characterized by their long erect pubescence, which was present on pronotum, scutellum, clavus, and corium of our specimens (Fig. 1). SLATER (1964), in his catalogue of the Lygaeidae of the World includes only three species in *Anorthuna*: *Nysius atlantidum* HORVÁTH, 1890 from the Azores (PÉRICART, 2001), *Nysius pilosulus* HORVÁTH, 1904 from Kirgizia and Mongolia (PÉRICART, 2001), and *Nysius vulcanorum* LINDBERG, 1958 from the Cape Verde Islands. All of these species were treated, more or less, in detail by WAGNER (1958) and it was clear from his descriptions that the material at hand did not belong to any of these species. Obviously, we were dealing with either an undescribed species or, more likely, an introduced species. Regrettably, no world revision of the genus existed, so where were we

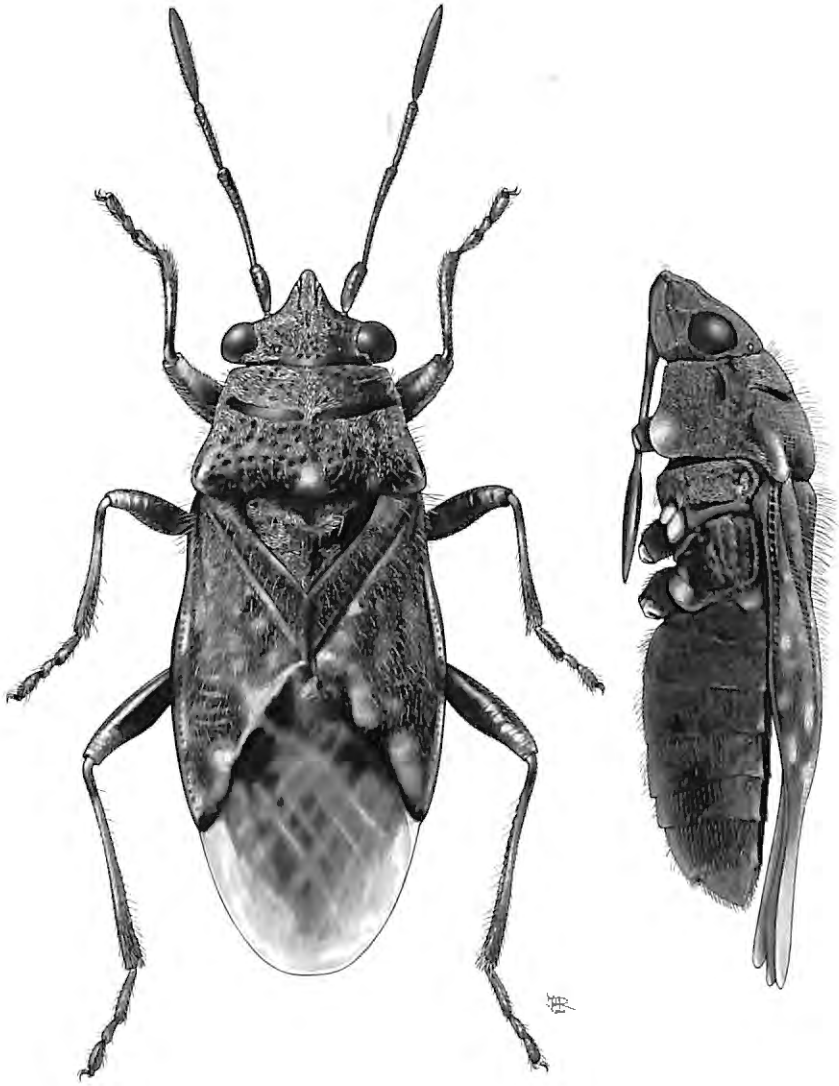

Fig. 1. *Nysius huttoni*, macropterous male (del. J. de Rond, Lelystad).

to start? First we checked the revision of the North American *Nysius* by BARBER (1947), but none of his descriptions fit our specimens, so the Nearctic species could be excluded.

Eventually, while checking the collection of the Zoological Institute in Saint Petersburg (ZMAS) during the third European Hemiptera Congress we found that our Dutch and Belgian specimens were conspecific with a large series of *Nysius huttoni* F.B. WHITE, 1878 collected by O.V. Kovalev in New Zealand in 1992!

Nysius huttoni F.B. WHITE, 1878

Identification

Detailed descriptions of adults, nymphal instars and eggs are provided by EYLES (1960). Moreover, for the first time this author showed that *Nysius huttoni* occurs in three forms in both sexes: macropters, in which the wings extend beyond the apex of the abdomen; submacropters (named sub-brachypterous by EYLES), in which the the wings reach or slightly exceed the apex of the abdomen; and brachypters, in which the wings do not reach the apex of the abdomen. Furthermore EYLES showed that *N. huttoni* comprises three size groups: large individuals (Group I: length 3.5-3.9 mm in males and 3.7-4.3 mm in females), medium sized individuals (Group II: length 3.0-3.5 mm in males and 3.4-3.7 mm in females), and small individuals (Group III: length 2.4-3.0 mm in males and 2.5-3.2 mm in females). Group I consisted of macropters only, but Groups II and III comprise all three wing morphs. Thus, depending on wing morph and size there are seven different kinds of individuals within the species. In addition, there is also considerable variation in colouration. Submacropters and especially brachypters are characterized by the distinctly convex hemelytra. EYLES & ASHLOCK (1969) revised the New Zealand *Nysius* and stated that apart from the brachyptery they are also unique compared with the species of the genus from other parts of the world by a full single or double row of punctures along the claval suture.

Egg and all five larval instars were measured and described in detail by EYLES (1960). The larvae lack the characteristic pubescence of the adults.

Nysius huttoni fits well into the group of *Nysius ericae* (SCHILLING, 1829) and *N. thymi* (WOLFF, 1804), but can be easily distinguished by the long erect pubescence of pronotum, scutellum, corium and clavus, the double row of punctures along the claval suture, and in submacropters and brachypters also by the remarkably convex hemelytra. The bucculae are of the same type as in *N. ericae* and *N. thymi*: gradually tapering posteriorly and abruptly ending before the posterior margin of the head (PÉRICART, 1999: fig. 65a). The genital aperture of the pygophore is similar to that of *N. thymi* (PÉRICART, 1999: Fig. 66d). Male and female genital structures are figured by EYLES & ASHLOCK (1969). In vivo the macropters are conspicuous by the shining wing membrane.

In the Dutch and Belgian material, all wing morphs distinguished by EYLES (1960) are present. However, a suction sample taken at Aalter on April 14, 2004 (84 males and 78 females) showed a differences between males and females. In males, most specimens were macropters (57.1%), with sub-macropters and brachypters making up 29.8 and 13.1% of the sample, respectively. On the other hand, in females, the majority were sub-macropterous (57.7%), 29.5% were macropterous and 12.8% brachypterous. Hand-collected samples are strongly biased towards the macropterous morph, because it is easier to spot being generally larger with a strikingly shiny wing membrane.

With the key in PÉRICART (1999), the species runs to *Ortholomus* STÅL, 1872, based on its dense, erect dorsal pubescence.

Biology

In New Zealand *Nysius huttoni* shows a wide ecological distribution from coastal locations to altitudes of over 1800 metres. Typical habitats in The Netherlands and Belgium, are dry, warm waste ground and roadsides with sparse vegetation. It is a polyphagous species feeding on various weed-plants. It occasionally invades and damages numerous crop species as well (see SWEET (2000) for a review), especially under dry conditions. It has been recorded feeding on the following plants: *Anagallis arvensis* L., *Calandrinia caulescens* H.B.K., *Capsella bursa-pastoris* (L.) MEDIK, *Cassinia leptophyla* (FORSTER F.) R. BR., *Chenopodium album* L., *Coronopus didymus* (L.) SM., *Hieracium* spp., *Medicago sativa* L., *Polygonum aviculare* L., *Rumex acetosella* L., *Silene gallica* L., *Soliva sessilis* RUIZ & PAV., *Spergularia rubra* (L.) J. & C. PRESSL, *Stellaria media* (L.) VILL., *Trifolium dubium* SIBTH., *T. pratense* L., *T. repens* L., *Triticum* spp. and probably some other grasses (summarized from SWEET, 2000). It is remarkable that apart from *Cassinia leptophyla* all these plants are introduced in New Zealand and most of them occur or even are common in habitats where Dutch and Belgian populations are found. At Aalter, Oost-Vlaanderen, where *N. huttoni* was found in large numbers in a small abandoned agricultural field (84 males and 78 females in a suction sample taken from about two square meters), aggregations of more than ten individuals were found between the dead remains and seeds of *Polygonum maculosa* Gray. At Kallo, Oost-Vlaanderen, *N. huttoni* was found repeatedly in small numbers on the introduced weed *Senecio inaequidens* DC. The presence of mosses may be crucial for overwintering of the species, because they were present at almost all localities visited in spring 2004, most frequently *Ceratodon purpureus* (HEDW.) BRID. A possible association with moss (*Sphagnum* and *Polytrichum* spp.) is also suggested by EYLES & ASHLOCK (1969).

Nysius huttoni overwinters as adult and has two or three generations a year in New Zealand. EYLES (1965) concluded that there were three generations per year in the North Island, and FARRELL & STUFKENS (1993) found two generations in the South Island. The number of generations under west European conditions is not yet clear, but related species under our climatic conditions have one or two generations per year. Adults overwinter: at Aalter on April 14 only adults (almost 400) were found, which were very active and frequently mating at the time.

Distribution

Nysius huttoni is found throughout the North and South Islands of New Zealand as well as at Stewart Island and the Chatham Islands (EYLES & ASHLOCK, 1969). We record it now for the first time outside this area: the

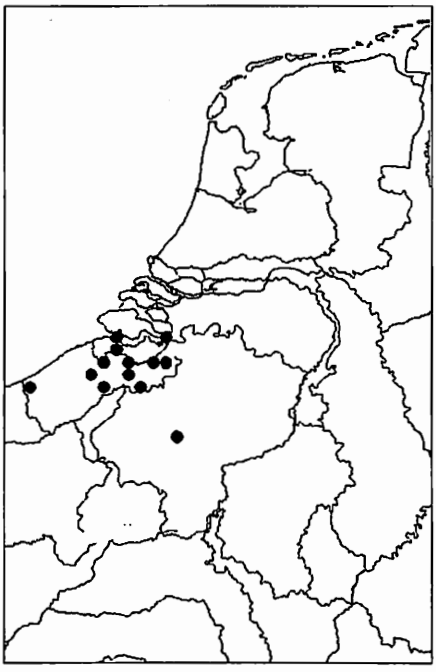

Fig. 2. Distribution of *Nysius huttoni* in Belgium and The Netherlands.

province of Zeeland in The Netherlands and the provinces of West-Vlaanderen, Oost-Vlaanderen and Brabant in Belgium (Fig. 2). The following material was collected (abbreviations for depositories: KAVE - Koninklijke Antwerpse Vereniging voor Entomologie, Antwerpen; KBIN - Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussel; ZMAN - Zoölogisch Museum, Universiteit van Amsterdam; ZMAS - Zoological Institute, Russian Academy of Sciences, St. Petersburg).

The Netherlands. Province Zeeland: Zeeuws-Vlaanderen, Biervliet (ES4585), 23.IV.2004, 2♀, leg. J.M. Bruers & G. Viskens (ZMAN): Hoofdplaat (ES4791), 1.IX.2002, 2♂, 2♀, leg. B. Aukema; Hoofdplaat (ES4890), 1.IX.2002, 1♀, leg. B. Aukema; Ibid., 23.IV.2004, 22♂, 11♀, leg. J.M. Bruers & G. Viskens (ZMAN). Zuid-Beveland, Bath (ES8095), 12.V.2004, 1♀, leg. G.M. Viskens (ZMAN).

Belgium. Province West-Vlaanderen: Beernem (ES2365), 21.IX.2004, 2♂, leg. G. Viskens (KBIN); De Panne, Westhoek (DS7158), 16.III.2004, 1♂, leg. J.-Y. Baugnée (KBIN). Province Oost-Vlaanderen: Aalter (ES3159), 22.IX. 2003, 1♂, 4♀, leg. J.M. Bruers (ZMAN); Ibid., 9.IV.2004, 12♂, 12♀, leg. J.M. Bruers & G.M. Viskens (KAVE, KBIN, ZMAN); Ibid., 14.IV.2004, 199♂, 196♀, leg. B. Aukema (ZMAN, ZMAS) and 4♂, 3♀, leg. G.M. Viskens (KBIN); Ibid., 9.IX.2004, 1♀, leg. J.M. Bruers (KBIN); Desteldonk (ES5463), 17.VII.2004, 4♂, 2♀, leg. J.M. Bruers (KBIN); Kallo (ES8978), 6.V.2004, 2♂, 3♀, 29.VI.2004, 1♀ and 7.VII.2004, 1♀, leg. J.M. Bruers (KBIN); Maldegem

(ES3173), 23.IV.2004, 7♂, 2♀, leg. G.M. Viskens & J.M. Bruers (KBIN); Stekene (ES7273), 21.VIII.2003, 1♀ (ZMAN) and 6.V.2004, 3♂, 3♀, leg. J.M. Bruers (KBIN); Uitbergen (ES6752), 14.VI.2004, 1♂, 1♀, leg. M. van Malderen (KBIN); Zelzate (ES5672), 17.VII.2004, 1♀, leg. G.M. Viskens (KBIN). Provincie Brabant: Ophain, Bois Seigneur-Isaac (ES9513), 7.IX.2004, 1♂, leg. J.M. Bruers (KBIN). Obviously, the species is well established in this part of the Low Countries and dispersal over a much larger area seems possible.

Economic importance

In New Zealand, *Nysius huttoni* is an economically important pest species, known as the wheat bug (SWEET, 2000). Cruciferous crops (*Brassica* spp.), Fabaceae (lucerne, red and white clover), and wheat (*Triticum* spp.) are attacked. Control is difficult because usually it feeds on weedy plants of waste lots and roadsides, often in the vicinity of crop plants, and only migrates to crops in dry years. In New Zealand, no natural enemies are known apart from predation by an introduced bird, the starling (LOBB & WOOD, 1971).

Concluding remarks

Increasing international trade and traffic increase the risk of species becoming established far from their natural environment. Recent examples are the introductions into Europe of the tingid *Corythucha arcuata* (SAY, 1832) (BERNARDINELLI & ZANDIGIACOMO, 2000), the coreid *Leptoglossus occidentalis* HEIDEMANN, 1910 (TAYLOR *et al.*, 2001) and the corixid *Trichocorixa verticalis* (FIEBER, 1851) (GÜNTHER, 2004) from North America and the tingid *Stephanitis takeyai* DRAKE & MAA, 1955 from Japan (AUKEMA, 1996). The route by which *Nysius huttoni* reached the Low Countries is not clear, but since all records up to now are close to the international harbour of Antwerpen, it seems likely it arrived accidentally with shipments from New Zealand. Further spread across Europe seems very likely and time will show whether it will behave as an "invasive alien" and become a pest in this part of the world as well.

Acknowledgements

Thanks are due to J. de Rond, Lelystad, for making the habitus drawings, to I.M. Kerzhner, Saint Petersburg, for access to the collection of the Zoological Institute, Saint Petersburg, G. Hilaire, Antwerpen, for identification of the moss, A.J.M. Loomans for assistance during field work, and B.S. Nau, Dunstable, for correcting the English text. M.-C. Larivière, New Zealand Arthropod Collection, Auckland, supported us with New Zealand specimens and literature. The distribution map was provided by V.J. Kalkman, EIS-Nederland, Leiden.

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