

***Naochila parvella* (DRAKE, 1954) (Hemiptera: Heteroptera: Tingidae) in Germany, a new alien species in Europe?**

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Abstract:

A single specimen of the lace bug *Naochila parvella* (DRAKE, 1954), species originating from southern Africa and Madagascar, was recently found in city park in Mönchengladbach-Rheydt (North Rhine-Westphalia). However, the species does not seem to be an established alien in European fauna.

Kurzfassung:

Ein Einzeltier der Gitterwanzen-Art *Naochila parvella* (DRAKE, 1954), ursprünglich aus S-Afrika und Madagascar, wurde kürzlich im Stadtpark von Mönchengladbach-Rheydt (NRW) gefunden. Die Art scheint aber noch kein etabliertes Neozoon in der europäischen Fauna zu sein.

Increasing rate of alien invasive species is recently considered as one of the important threats to biodiversity worldwide. This trend concerns also the lace bugs (Tingidae). In continental Europe, the first alien species of lace bugs were the East Asiatic *Stephanitis pyrioides* (SCOTT, 1874) (= *S. azaleae* HORVÁTH, 1905) and the Nearctic *Stephanitis rhododendri* HORVÁTH, 1905, recorded on *Rhododendron* spp. in the Netherlands by HORVÁTH (1905). Afterwards, six more exotic lacebugs were found in Europe: the Nearctic *Corythucha ciliata* (SAY, 1832) (on *Platanus* spp.), Japanese *Stephanitis takeyai* DRAKE & MAA, 1955 (on *Pieris japonica*), Nearctic *Corythucha arcuata* (SAY, 1832) (on *Quercus* spp.) (PÉRICART 1983, PÉRICART & GOLUB 1996, AUKEMA et al. 2013), Oriental *Corythauma ayyari* (DRAKE, 1933) (polyphagous, e.g. on *Jasminum* and *Lantana*) (STREITO et al. 2010), and Neotropical species *Leptodictya tabida* (HERRICH-SCHAEFFER, 1840) and *L. bambusae* DRAKE, 1918 (pests on bamboo and sugar cane) (STREITO et al. 2013). Recently, we received for identification one specimen of a lace bug (Fig. 1-3) collected in western Germany, superficially resembling the genus *Dictyla* STÅL, 1874. However, a closer examination revealed that the specimen belongs to the Afrotropical species *Naochila parvella* (DRAKE, 1954), widely distributed in southern African countries and Madagascar (see Table 1).

Material examined: 1 ♀, GERMANY: North Rhine-Westphalia, Mönchengladbach-Rheydt, Rheydter Stadtwald, 51°9'23.758"N 6°24'33.277"E, leaf forest, beer trap, 24.04.–17.05.2016, V. DVOŘÁKOVÁ leg. (coll. National Museum, Prague).

The Palaetropical genus *Naochila* DRAKE, 1957 currently includes 23 species (see Table 1) distributed in Afrotropical Region (including Madagascar and Yemen) (19 species) and India (4 species) (DRAKE & RUHOFF 1965, PÉRICART & GOLUB 1956, GÖLLNER-SCHEIDING 2004, GUILBERT 2017). *Naochila* is rather close to *Cochlochila* STÅL, 1873 and several species presently included in the first were previously described in the latter. According to LINNAVUORI (1977) the two genera can be separated by the differences in size and shape of the body, structure of the paranota, and number of tumid elevations on hemelytra (one in *Naochila*, two in *Cochlochila*). These criteria were partly questioned by DUARTE RODRIGUES (1979) who concluded that „the only taxonomic character which separates these two genera is the number of tumid elevations on the hemelytra”. The main differences to distinguish *Naochila* and *Dictyla* are the paranota more elevated in *Naochila* species than in *Dictyla* species, but there is variation in morphology of both genera, which are not easy to distinguish. Therefore it is evident, that status and composition of the three mentioned genera, *Cochlochila*, *Dictyla*, and *Naochila*, will require revision in the future.

The specimen was collected using beer trap as follows: 0.5 litre of lager beer was put into 1 liter PET bottle, which was hung on a tree branch ca. 1.8 metre above the ground (cf. DVOŘÁK et al. 2008). The habitat was a secondary town forest planted on recultivation of former dump site. The place has now a strong touristic activity, the prevailing tree species is *Carpinus betulus*. The trap was installed

on a request of LIBOR DVOŘÁK by his sister living in Mönchengladbach and recovered directly by L. DVOŘÁK. The material from the trap was sieved, washed in water and put into the tube with ca. 50% ethanol. Mislabelling of the specimen is excluded as no material of true bugs from Africa or India was simultaneously at L. DVOŘÁK's hands.

Despite we became used to discoveries of new alien species all around Europe, there is some uncertainty about the possible establishment of *Naochila parvella* in Germany which needs to be clarified before we put the species on the list of European neobiota. The review of the plants known in association with *Naochila* species is given in Table 2. Neither of the known plants reported in association with *N. parvella*, *Acacia hebeclada* [Fabaceae] and *Ehretia rigida* [Boraginaceae] (DUARTE RODRIGUES 1982a) occurs in Europe. Finding this undoubtedly tropical species in outdoor conditions of northern Germany is unexpected and most probably represents an accidental introduction with tourism or imported plants or goods. In this situation, we do not consider *N. parvella* an established alien species in Germany.

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Fig. 1: *Naochila parvella* (DRAKE, 1954) dorsal view, ♀.

Table 1. Known distribution of *Naochila* species

<i>N. adenana</i> (DRAKE, 1957)	Ethiopia, South Sudan, Yemen	DRAKE (1957A), DRAKE & RUHOFF (1965), LINNAVUORI 1977), GÖLLNER-SCHEIDING (2004)
<i>N. arete</i> DRAKE & MOHANASUNDARUM, 1961	India	DRAKE & MOHANASUNDARUM (1961), DRAKE & RUHOFF (1965)
<i>N. aristata</i> DUARTE-RODRIGUES, 1979	Ivory Coast	DUARTE-RODRIGUES (1979), GÖLLNER-SCHEIDING (2004)
<i>N. boxiana</i> (DRAKE, 1953)	Angola, Cameroon, Democratic Republic of the Congo, Ghana, Guinea, Ivory Coast, Kenya, Nigeria, Rwanda, Sierra Leone, Uganda	DRAKE (1953), DRAKE & RUHOFF (1965), DUARTE RODRIGUES (1979), GÖLLNER-SCHEIDING (2004)
<i>N. bukobana</i> (DRAKE, 1953)	Kenya, Tanzania	DRAKE (1953), DRAKE & RUHOFF (1965), GÖLLNER-SCHEIDING (2004)
<i>N. bullana</i> (DRAKE, 1958)	Madagascar	DRAKE (1958), DRAKE & RUHOFF (1965), GÖLLNER-SCHEIDING (2004)
<i>N. dalbergiae</i> DUARTE-RODRIGUES, 1982	Madagascar, South Africa	DUARTE-RODRIGUES (1982A), GÖLLNER-SCHEIDING (2004)
<i>N. drakei</i> DUARTE-RODRIGUES, 1992	Madagascar	DUARTE-RODRIGUES (1992), GÖLLNER-SCHEIDING (2004)
<i>N. engys</i> DRAKE & HILL, 1964	Ethiopia, Mozambique, South Africa	DRAKE & HILL (1964), DUARTE RODRIGUES (1979), GÖLLNER-SCHEIDING (2004)
<i>N. exolenta</i> (DRAKE, 1957)	Somalia, Yemen	DRAKE (1957A), DRAKE & RUHOFF (1965), LINNAVUORI (1977), GÖLLNER-SCHEIDING (2004)
<i>N. inaequalis</i> LINNAVUORI, 1977	Ethiopia	LINNAVUORI (1977), GÖLLNER-SCHEIDING (2004)
<i>N. insularis</i> DUARTE-RODRIGUES, 1982	Madagascar	DUARTE-RODRIGUES (1982B), GÖLLNER-SCHEIDING (2004)
<i>N. ituriensis</i> (SCHOUTEDEN, 1953)	Democratic Republic of the Congo, Guinea, Uganda	SCHOUTEDEN (1953A), DRAKE & RUHOFF (1965), GÖLLNER-SCHEIDING (2004)
<i>N. kivuensis</i> (SCHOUTEDEN, 1953)	Democratic Republic of the Congo, Ethiopia, Kenya, Rwanda, Tanzania, Uganda	SCHOUTEDEN (1953B), DRAKE & HILL (1964), DRAKE & RUHOFF (1965), DUARTE RODRIGUES (1979, 1982B), GÖLLNER-SCHEIDING (2004)
<i>N. minuta</i> LIVINGSTONE & JEYANTHIBAI, 1994	India	LIVINGSTONE & JEYANTHIBAI (1994)
<i>N. miongavensis</i> DUARTE-RODRIGUES, 1982	Kenya	DUARTE-RODRIGUES (1982C), GÖLLNER-SCHEIDING (2004)
<i>N. naivashae</i> (DRAKE, 1948)	Kenya, Malawi	DRAKE (1948), DRAKE & RUHOFF (1965), GÖLLNER-SCHEIDING (2004)
<i>N. natalana</i> (DRAKE, 1954)	Kenya, Mozambique, Namibia, South Africa, South Sudan	DRAKE (1954), DRAKE & RUHOFF (1965), LINNAVUORI (1977), DUARTE RODRIGUES (1979), GÖLLNER-SCHEIDING (2004)
<i>N. nigra</i> LIVINGSTONE & JEYANTHIBAI, 1994	India	LIVINGSTONE & JEYANTHIBAI (1994)
<i>N. parvella</i> (DRAKE, 1954)	Botswana, Madagascar, Mozambique, Namibia, South Africa	DRAKE (1954), DRAKE & RUHOFF (1965), DUARTE RODRIGUES (1979, 1982C), GÖLLNER-SCHEIDING (2004)
<i>N. sufflata</i> (DRAKE & POOR, 1939)	India	DRAKE & POOR (1939), DRAKE & RUHOFF (1965)
<i>N. turgida</i> DRAKE, 1957	Madagascar	DRAKE (1957B), DRAKE & RUHOFF (1965), GÖLLNER-SCHEIDING (2004)
<i>N. yemenana</i> (DRAKE, 1957)	Yemen	DRAKE (1957A), DRAKE & RUHOFF (1965), GÖLLNER-SCHEIDING (2004), LINNAVUORI & VAN HARTEN (2005)

Table 2. Known plant associations of *Naochila* species. The plant species on which *Naochila* specimens were found but for which it is not certain they are the true host plants are cited in parantheses following GÖLLNER-SCHEIDING (2004).

Species	Host plant	REFERENCE
<i>N. arete</i> DRAKE & MOHANASUNDARUM, 1961	<i>Cordia</i> sp. [Boraginaceae]	DRAKE & MOHANASUNDARUM (1961)
<i>N. boxiana</i> (DRAKE, 1953)	(<i>Cynometra alexandri</i>) [Caesalpiniaceae]	GÖLLNER-SCHEIDING (2004)
	<i>Hoslundia oppositifolia</i> [Lamiaceae]	DRAKE (1953)
	(<i>Teclea nobilis</i> [Rutaceae])	GÖLLNER-SCHEIDING (2004)
<i>N. dalbergiae</i> DUARTE-RODRIGUES, 1982	<i>Dalbergia armata</i> [Fabaceae]	DUARTE RODRIGUES (1982A)
<i>N. engys</i> DRAKE & HILL, 1964	<i>Cordia ovalis</i> [Boraginaceae]	DRAKE & HILL (1964)
	<i>Ehretia cymosa</i> [Boraginaceae]	DRAKE & HILL (1964)
	<i>Ehretia rigida</i> [Boraginaceae]	DRAKE & HILL (1964)
<i>N. exolenta</i> (DRAKE, 1957)	„wild jasmine“ (<i>Jasminum</i> ?) [Oleaceae]	DRAKE (1957A)
<i>N. kivuensis</i> (SCHOUTEDEN, 1953)	<i>Acanthus</i> sp. [Acanthaceae]	SCHOUTEDEN (1953B)
	<i>Acanthus eminens</i> [Acanthaceae]	DRAKE & HILL (1964)
	<i>Ficus</i> sp. [Moraceae]	SCHOUTEDEN (1953B)
	<i>Ficus capensis</i> [Moraceae]	GÖLLNER-SCHEIDING (2004)
	(<i>Teclea nobilis</i>) [Rutaceae]	GÖLLNER-SCHEIDING (2004)
<i>N. minuta</i> LIVINGSTONE & JEYANTHIBAI, 1994	<i>Carmona retusa</i> (= <i>C. microphylla</i>) [Boraginaceae]	LIVINGSTONE & JEYANTHIBAI (1994)
<i>N. natalana</i> (DRAKE, 1954)	Lamiaceae	LINNAVUORI (1977)
	<i>Ocimum americanum</i> [Lamiaceae]	GÖLLNER-SCHEIDING (2004)
<i>N. nigra</i> LIVINGSTONE & JEYANTHIBAI, 1994	<i>Ehretia</i> sp. [Boraginaceae]	LIVINGSTONE & JEYANTHIBAI (1994)
<i>N. parvella</i> (DRAKE, 1954)	<i>Acacia hebeclada</i> [Fabaceae]	DUARTE RODRIGUES (1982A)
	<i>Ehretia rigida</i> [Boraginaceae]	DUARTE RODRIGUES (1982A)
<i>N. sufflata</i> (DRAKE & POOR, 1939)	<i>Ehretia laevis</i> [Boraginaceae]	DRAKE & RUHOFF (1965)
	<i>Lantana</i> sp. [Verbenaceae]	DRAKE & POOR (1939)

Fig. 2 u.3:
Naochila parvella ♀
(DRAKE, 1954), lateral (2)
and anterolateral (3) view.



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