

Woodlice of the green houses at Ghent Botanical Garden and Botanic Garden Meise with two new exotic species for Belgium (Isopoda: Oniscidae)

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Abstract

In countries with a mild climate, greenhouses are often the only places, where exotic species can survive outside their native range. This is certainly the case for woodlice, of which the greenhouse fauna is relatively well studied in neighbouring countries. In Belgium, inventories of woodlice in greenhouses are very scarce. Here we report woodlouse inventories in Ghent Botanical Garden and Botanic Garden Meise during 2015-2017, resulting in fourteen species of which five are exotic. Two species are mentioned for the first time in Belgium being *Nagurus cristatus* (Dollfus, 1889) and *Reductoniscus costulatus* Kesselyák, 1930. An overview of woodlouse inventories in greenhouses in Belgium is given.

Keywords: Belgium, Distribution, Greenhouse fauna, *Nagurus cristatus*, *Reductoniscus costulatus*, Woodlouse

Samenvatting

Verwarmde kassen zijn, door hun constant en warmer klimaat, vaak de enige plaatsen waar exotische soorten kunnen overleven buiten hun natuurlijk verspreidingsgebied. Dit is ook zo voor pissebedden, waarvan de fauna van verwarmde kassen vrij goed bestudeerd is in onze buurlanden. In België zijn deze inventarissen schaars. In dit artikel rapporteren we enkele inventarisaties van pissebedden in de plantentuin in Gent en Meise gedurende 2015-2017. Dit resulteerde in veertien soorten waarvan vijf uitheems zijn. Twee soorten werden voor de eerste keer in België waargenomen nl. *Nagurus cristatus* (Dollfus, 1889) en *Reductoniscus costulatus* Kesselyák, 1930. Een overzicht van inventarisaties van pissebedden in verwarmde kassen in België is weergegeven.

Résumé

Les serres sont, en raison de leurs températures élevées, souvent les seuls endroits dans les pays à climat doux, où des espèces exotiques peuvent survivre car elles y trouvent des conditions similaires à celles de leur pays d'origine. C'est le cas en effet pour les cloportes exotiques. La faune des serres est relativement bien étudiée dans les pays voisins. En Belgique, les cloportes exotiques sont rares. Lors d'un inventaire aux jardins botaniques de Gand et de Meise effectué en 2015-2017, quatorze espèces de cloportes dont cinq exotiques ont été trouvées. Parmi ces dernières, deux espèces sont mentionnées pour la première fois de Belgique : *Nagurus cristatus* (Dollfus, 1889) et *Reductoniscus costulatus* Kesselyák, 1930. Nous donnons aussi un aperçu des cloportes des serres en Belgique.

Introduction

Greenhouses are very often the only places where exotic species can survive in temperate regions. Many species are introduced via the import of exotic plants and can often establish viable populations inside the greenhouses. Although many species are not able to survive outside greenhouses it sounds reasonable that they might be able to do this once the outside climate gets more suitable. Therefore, it

is interesting to know which species occur in greenhouses to evaluate the change that they will establish populations in the wild. Woodlice in greenhouses and heated environments in e.g. zoos are studied relatively well in the Netherlands (BERG *et al.*, 2008) with eight species that are restricted to greenhouses. Studies from Belgium are however extremely scarce. In Belgium, only two species are known to exclusively occur in greenhouses being *Cordioniscus stebbingii* (Patience, 1907) and *Trichorina tomentosa* (Budde-Lund, 1893) while some others were first reported from greenhouses but appeared to be native with the discovery of wild populations e.g. *Trichoniscus pygmaeus* Sars, 1898, *Haplophthalmus danicus* Budde-Lund, 1880 and *Armadillidium nasatum* Budde-Lund, 1885 (BAGNALL, 1907). The last note on woodlice from greenhouses in Belgium dates back to 1973 (KERSMAEKERS, 1973), while the last reported inventory was done in 1956 (POLK & VAN OYE, 1956). Therefore, an update on woodlice in Belgian greenhouses could be interesting more than 60 years after the last inventory. This was the reason to undertake some short visits to the greenhouses of Ghent Botanical Garden and Botanic Garden Meise in 2015-2017 to evaluate the presence of woodlouse species in greenhouses.

Surveys

During four inventories between 2015 and 2017 to Ghent botanical garden and one to Botanic Garden Meise, we found a total of fourteen woodlouse species mostly underneath stones and flowerpots (Table 1). Five out of fourteen species can be considered as exotic, of which two species and one genus mentioned for the first time in Belgium. These are *Nagurus cristatus* (Dollfus, 1889), *Reductoniscus costulatus* Kesselyák, 1930 and *Synarmadillo* spec. A visit to Botanic Garden Meise in May 2016 did not result in additional species but resulted in a second location for *N. cristatus*. The two new species and new genus are shortly discussed below. The collected specimens are deposited in the private collection of Pallieter De Smedt.

Table 1. Species reported from greenhouses in Belgium by BAGNALL (1907, 1908), POLK & VAN OYE (1956) and this study. KERSMAEKERS (1973) reported again *T. tomentosa* from the botanical gardens of Ghent but this single observation was not reported in the table. X: presence of the species, (X) species of which BAGNALL (1907) did not report if it was collected in Brussels or Antwerp, X* specimens collected at Ghent botanical garden in Juli 1949 that were stored at the Natural History Museum in Leiden (the Netherlands) and re-identified by POLK & VAN OYE (1956). POLK & VAN OYE (1956) reports a woodlouse of the genus *Rhyscotus*. He mentions that the specimen was send to Prof. Vandel in Toulouse but after this, there has been no report of the species anymore. Therefore, we did not include it in the list.

	BAGNALL 1907, 1908		POLK & VAN OYE 1956		This study 2015-2017	
	Brussel	Antwerp	Ghent	Antwerp	Ghent	Meise
<i>Androniscus dentiger</i> Verhoeff, 1908	X	X	X*	X	X	
<i>Armadillidium nasatum</i> Budde-Lund, 1885	X	X	X		X	X
<i>Armadillidium vulgare</i> Latreille, 1804					X	
<i>Cordioniscus stebbingii</i> (Patience, 1907)	X		X*		X	
<i>Cylisticus convexus</i> (De Geer, 1778)	(X)	(X)				
<i>Haplophthalmus danicus</i> Budde-Lund, 1880	X		X		X	
<i>Haplophthalmus mengii</i> (Zaddach, 1844)		X				
<i>Nagurus cristatus</i> (Dollfus, 1889)					X	X
<i>Oniscus asellus</i> Linnaeus, 1758	(X)	(X)		X	X	
<i>Philoscia muscorum</i> (Scopoli, 1763)	(X)	(X)			X	
<i>Platyarthrus hoffmannsseggi</i> Brandt, 1833					X	
<i>Porcellio dilatatus</i> Brandt, 1833	X	X		X		
<i>Porcellio scaber</i> Latreille, 1804	(X)	(X)	X*	X	X	X
<i>Porcellio spinicornis</i> Say, 1818		X		X		
<i>Porcellionides pruinosus</i> (Brandt, 1833)	(X)	(X)		X		
<i>Reductoniscus costulatus</i> Kesselyák, 1930					X	
<i>Synarmadillo</i> spec.					X	
<i>Trichorina tomentosa</i> (Budde-Lund, 1893)			X		X	X
<i>Trichoniscus pusillus</i> s.l.	(X)	(X)				
<i>Trichoniscus pygmaeus</i> Sars, 1898	X	X			X	



Fig. 1. *Nagurus cristatus* (photograph: Gert Arijs).



Fig. 2. *Reductoniscus costulatus* (photograph: Walter P. Pflieger).

***Nagurus cristatus* (Dollfus, 1889) Belg. sp. nov.**

MATERIAL: Ghent, greenhouse, 31UES5053, 5.II.2015, 2♀♀, leg. & det. Pallieter De Smedt — 10.VII.2015, 2♀♀, leg. & det. Pallieter De Smedt — 18.XII.2015, 50 ex., det. Pallieter De Smedt — 17.III.2017, 10 ex., det. Pallieter De Smedt — Meise, greenhouse, 31UES9342, 1.V.2016, 1♀, det. Gert Arijs.

The species (Fig. 1) is pantropical and occurs in greenhouses in temperate regions (SCHMALFUSS, 2003). *Nagurus cristatus* was very common in the subtropical greenhouses where it mostly occurred underneath flowerpots on concrete. All collected specimens were females. Males are very rare and the species reproduces asexual (BERG & WIJNHOFEN, 1997). The species was also found in greenhouses at Botanic Garden Meise. See GREGORY (2014) for drawings of the species.

***Reductoniscus costulatus* Kesselyák, 1930 Belg. sp. nov.**

MATERIAL: Ghent, greenhouse, 31UES5053, 5.II.2015, 1ex., leg. & det. Pallieter De Smedt.

The species (Fig. 2) is known from the Seychelles, Mauritius, Malaysia and Hawaiian Islands but also occurs in greenhouses in Europe (SCHMALFUSS, 2003). Only one specimen was found underneath a stone on humid soil in the tropical greenhouse. The habitat corresponds to sightings in greenhouses in the Netherlands where this species is found under humid conditions (BERG *et al.*, 2008). See GREGORY (2014) for drawings of the species.

***Synarmadillo* spec.**

MATERIAL: Ghent, greenhouse, 31UES5053, 5.II.2015, 1ex., det. Pallieter De Smedt. (The specimen got lost for further identification.)

A single individual of the genus *Synarmadillo* was found in the tropical greenhouse at Ghent botanical garden. After collection, the specimen got lost. Therefore, it was not possible to identify the individual to species level. In a Dutch greenhouse *Synarmadillo pallidus* Arcangeli, 1950 has been reported. A species originally described from Zaïre (SCHMALFUSS, 2003). In the Netherlands, this species has been found in only one greenhouse and is absent from Germany and the UK (BERG *et al.*, 2008). Therefore, it is not certain if the specimen at Ghent botanical gardens is the same species. SCHMALFUSS (2003) reports more than 20 species within the genus *Synarmadillo*.

The nine native species (Table 1) recorded in the greenhouses from Ghent and Meise are all very common or common in Belgium. *Armadillidium vulgare* and *Platyarthrus hoffmannsseggi* are recorded for the first time inside greenhouses in Belgium.

Discussion

Twenty woodlouse species have been recorded in Belgian greenhouses up to date of which five can be considered as exotic. Four of these species are widespread in greenhouses across the Netherlands (BERG *et al.*, 2008) and the rest of Europe (SCHMALFUSS 2003) and are easily transported via horticultural trade. Therefore, they can be expected to occur in many greenhouses in Belgium as well. Only the status of the *Synarmadillo* species remains somewhat unclear. Hopefully, a second specimen can be found in the near future to identify the species. Furthermore, there are three other species recorded in Dutch greenhouses (BERG *et al.*, 2008) and no less than 17 species are known from greenhouses in the UK (GREGORY, 2014). Inventories in Belgian greenhouses can probably extend table 1 with some of these species. Alongside the exotic species, also some native species are frequently found in greenhouses like *P. scaber*, *H. danicus*, *T. pygmaeus*, *A. dentiger* and *A. nasatum*. The latter two occur, outside greenhouses, mostly on anthropogenic disturbed areas like graveyards in the northern part of the country. In the southern part of Belgium, they are not anthropogenic. The other three species are common in most areas in Belgium.

We hope that this article can encourage people to have a closer look at woodlice in Belgian greenhouses, both botanical greenhouses and in zoos. In Belgium, there is no report of woodlouse inventories in zoos while there is evidence that zoos can harbour some interesting species (BERG *et al.*, 2008).

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