

- MATERN H.D. & SIEDE D., 2001. - *Cryptocephalus bameuli* Duhaldeborde, 1999 (Coleoptera, Chrysomelidae) - eine neue mitteleuropäische Blattkäferart auch im Rheinland. *Mitteilungen der Arbeitsgemeinschaft Rheinischer Koleopterologen*, 11(1): 29-32.
- MATHIEU C., 1860. - Catalogue des Coléoptères de Belgique. *Annales de la Société entomologique de Belgique*, 4(1): 1-55.
- MONTAGNA M., KUBISZ D., MAZUR M.A., MAGOGA G. SCIBIOR R. & KAJTOCH L., 2016. - Exploring species-level taxonomy in the *Cryptocephalus flavipes* species complex (Coleoptera: Chrysomelidae). *Zoological Journal of the Linnean Society*, 179: 92-109, DOI: 10.1111/zoj.12445.
- MOUSSET A., 1984. - *Atlas provisoire des Insectes du Grand-Duché de Luxembourg – Coleoptera*, Fascicule 5, cartes 622-846 (Chrysomelidae), Musée d'Histoire Naturelle, Luxembourg.
- RHEINHEIMER J. & HASSLER M., 2018. - *Die Blattkäfer Baden-Württembergs*. Kleinsteuber Books. Karlsruhe, 928 pp.
- WINKELMAN J.K. & BEENEN R., 2010. - Chrysomelidae - haantjes (excl. Bruchinae): 149-158. O. Vorst (ed.) *Catalogus van de Nederlandse kevers (Coleoptera). Monografieën van de Nederlandse Entomologische Vereniging*, 11: 1-317.

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The Entognatha, Malacostraca and Myriapoda of the botanical garden Jean Massart (Brussels-Capital Region, Belgium)

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Abstract

During an inventory of the botanical garden Jean Massart in Auderghem, eight species of Entognatha (six Collembola and two Diplura), 13 Malacostraca (one Amphipoda and 12 Isopoda) and 23 Myriapoda (nine Chilopoda, 12 Diploda and two Symphyla) were observed. The most remarkable species were *Porcellio dilatatus* Brandt, 1833, *Geophilus osquidatum* Brölemann, 1909 and *Cylindroiulus britannicus* (Verhoeff, 1891).

Keywords: Amphipoda, Chilopoda, centipedes, Collembola, Diplopoda, Isopoda, millipedes, springtails, Symphyla, woodlice

Samenvatting

Tijdens een inventarisatie van de plantentuin Jean Massart in Oudergem werden acht soorten Entognatha (zes Collembola en twee Diplura), 13 Malacostraca (één Amphipoda en 12 Isopoda) en 23 Myriapoda (negen Chilopoda, 12 Diploda en twee Symphyla) waargenomen. De meest vermeldenswaardige soorten waren *Porcellio dilatatus* Brandt, 1833, *Geophilus osquidatum* Brölemann, 1909 en *Cylindroiulus britannicus* (Verhoeff, 1891).

Résumé

Pendant un inventaire du jardin botanique Jean Massart à Auderghem, huit espèces d'Entognatha (six Collembola et deux Diplura), 13 Malacostraca (un Amphipoda et 12 Isopoda) et 23 Myriapoda (neuf Chilopoda, 12 Diploda et deux Symphyla) ont été observés. Les espèces les plus remarquables étaient *Porcellio dilatatus* Brandt, 1833, *Geophilus osquidatum* Brölemann, 1909 et *Cylindroiulus britannicus* (Verhoeff, 1891).

Introduction

From 2015 till 2021, an inventory of the arthropod fauna was realised in the botanical garden Jean Massart, which is located in Auderghem in the Brussels-Capital Region and situated close to the Sonian Forest. The garden covers only five hectares, but contains a lot of different habitats and diverse botanical collections (i.e. medicinal plants, evolutionary garden, arboretum) as well as differentiated management areas (i.e. lean hay meadow, collection orchards) (DRUMONT *et al.*, 2020). This inventory was a citizen science project organised by the Royal Belgian Institute of Natural Sciences and supported by Bruxelles-Environnement (permits, site logistics, ...). The occasion for this project was the 100-year anniversary of the botanical garden Jean Massart in 2022. Here, the results for some groups of soil organisms (Entognatha, Malacostraca and Myriapoda) are presented, the results for the spiders, harvestmen and pseudoscorpions were published by HENRARD *et al.* (2022) and results for insects will be published elsewhere.

Table 1. Overview of the Entognatha (Collembola & Diplura), Malacostraca (Amphipoda & Isopoda) and Myriapoda (Chilopoda, Diplopoda & Symphyla) observed in the botanical garden Jean Massart (Auderghem, Brussels-Capital Region, Belgium).

Collembola

Cyphoderus albinus Nicolet, 1842
Dicyrtoma fusca (Lubbock, 1873)
Entomobrya nivalis (Linnaeus, 1758)
Orchesella cincta (Linnaeus, 1758)
Tomocerus minor (Lubbock, 1862)
Tomocerus vulgaris (Tullberg, 1871)

Diplura

Campodea lankesteri Silvestri, 1912
Campodea lubbocki Silvestri, 1912

Amphipoda

Cryptorchestia garbinii Ruffo, Tarocco & Latella, 2014

Isopoda

Armadillidium nasatum Budde-Lund, 1885
Armadillidium vulgare Latreille, 1804
Haplophthalmus montivagus Verhoeff, 1941
Oniscus asellus Linnaeus, 1758
Philoscia muscorum (Scopoli, 1763)
Platyarthus hoffmannseggii Brandt, 1833
Porcellio dilatatus Brandt, 1833
Porcellio scaber Latreille, 1804
Porcellio spinicornis Say, 1818
Trachelipus rathkii (Brandt, 1833)
Trichoniscus provisorius Racovitza, 1908
Trichoniscus pusillus Brandt, 1833

Chilopoda

Cryptops hortensis (Donovan, 1810)
Cryptops parisi Brölemann, 1920
Geophilus osquidatum Brölemann, 1909
Geophilus truncorum Bergsoë & Meinert, 1866
Lithobius forficatus (Linnaeus, 1758)
Lithobius melanops Newport, 1845
Lithobius microps Meinert, 1858
Schendyla nemorensis (C.R. Koch, 1837)
Stigmatogaster subterranea (Shaw, 1789)

Diplopoda

Allajulus nitidus (Verhoeff, 1891)
Blaniulus guttatus (Fabricius, 1798)
Choneiulus palmatus (Némec, 1895)
Cylindroiulus britannicus (Verhoeff, 1891)
Cylindroiulus caeruleocinctus (Wood, 1864)
Cylindroiulus punctatus (Leach, 1815)
Cylindroiulus truncorum (Silvestri, 1896)
Julus scandinavicus Latzel, 1884
Leptoiulus belgicus (Latzel, 1884)
Polyxenus lagurus (Linnaeus, 1758)
Polydesmus coriaceus Porat, 1871
Tachypodoiulus niger (Leach, 1814)

Symphyla

Scutigera caudata Michelbacher, 1942
Scutigera palmonii Michelbacher, 1942

Material and methods

Dozens of sampling techniques were used to sample arthropods, however, the groups discussed here were mainly found on sight after turning stones and logs. Springtails were identified with the book of HOPKIN (2007), Diplura with the article of LOCK (2009), amphipodes with the article of EGGERS & MARTENS (2001), isopods with the key of BERG & WIJNHOFEN (1997), Chilopoda with the book of IORIO & LABROCHE (2015), Diplopoda with the books of HAUSER & VOIGTLANDER (2019) and BLOWER (1985) and Symphyla with the article of EDWARD (1959). Voucher specimens of the collected material are preserved and stored in the collections of the Royal Belgian Institute of Natural Sciences (RBINS).

Results

During the inventory, eight Entognatha (six springtails and two Diplura), 13 Malacostraca (one Amphipoda and 12 Isopoda) and 23 Myriapoda (nine Chilopoda, 12 Diplopoda and two Symphyla) were observed (Table 1).

Discussion

Diplura can only be identified using a microscope and because not that many specimens were sampled, only two species could be identified, which are both common in Belgium (LOCK *et al.*, 2010). Collembola were not systematically sampled and only six common species were observed. No Protura were found, but these are too small to be found by the naked eye.

Most large terrestrial woodlice, that could be expected, were encountered, however, some additional species of the smaller Trichoniscidae might be expected. The rarest observed woodlouse was undoubtedly *Porcellio dilatatus* Brandt, 1833, which was found under logs in a conifer plot. It is a thermophilous species introduced from Southern Europe that only occurs near buildings (DE SMEDT *et al.*, 2020). The species seems to be getting even scarcer during the last decades due to the disappearance of messy small farms and is considered as critically endangered on the Red List of terrestrial isopods in Flanders (DE SMEDT *et al.*, 2020; 2022). However, since this species has been introduced from Southern Europe and only occurs in anthropogenic habitats, no measures are taken to protect this species. Although *Haplophthalmus montivagus* Verhoeff, 1940 was discovered in Belgium not that long ago (LOCK, 2007), this species turned out to be quite common in Belgium and is only absent north of the loamy region (DE SMEDT *et al.*, 2020). All other observed woodlice are also common in Belgium (DE SMEDT *et al.*, 2020). The only observed amphipod was the beach hopper *Cryptorchestia garbinii* Ruffo, Tarocco & Latella, 2014, the only inland species in Belgium that is partially terrestrial. No attempt was made to look for aquatic Malacostraca and other Crustacea.

The centipede *Geophilus osquidatum* Brölemann, 1909 was previously only reported twice from Belgium: in 2006 from 's Gravenvoeren (LOCK, 2010b) and in 2009 from Lanaye. All other observed centipedes are common in Belgium (LOCK, 2001). Nine species of centipedes is not a low number, but if additional species can be expected, *Geophilus carpophagus* Leach, 1815, *Geophilus flavus* (De Geer, 1778), *Lithobius macilentus* L. Koch, 1862 and *Lithobius crassipes* L. Koch, 1862 are the most likely candidates to turn up. The millipede *Cylindroiulus britannicus* (Verhoeff, 1891) was only recently confirmed for Belgium (PROESMANS & DE SMEDT, 2015), however, since then it has been reported from anthropogenic habitats all over Flanders on the online data platform waarneming.be. The remaining part of the millipedes are common in Belgium (KIME, 2004). Eleven species of millipedes is not so much; *Brachydesmus superus* Latzel, 1884 *Chordeuma sylvestre* C.L. Koch, 1847, *Craspedosoma rawlinsi* Leach, 1815, *Glomeris marginata* (Villers, 1789), *Leptoiulus kervillei* (Brölemann, 1896), *Melogona gallica* (Latzel, 1884) and *Polydesmus angustus* Latzel, 1884 are the most likely species that might have been overlooked. Both Belgian Symphyla of the family Scutigereidae were observed, which are both common in Belgium (LOCK, 2010a), however, none of the smaller Scolopendrellidae was found. Pauropoda were not found because these are hardly visible by the naked eye and no special effort was undertaken to find them.

Although woodlice, centipedes and millipedes are usually sampled with pitfall traps, this technique could hardly be used in the botanical garden, because many amphibians are present. A lot of different sampling techniques were used in the site, however, most of the species reported here were found on sight after turning stones and logs. Despite the proximity of the Sonian forest, none of the species that are characteristic for old forests was encountered. Most observed species are generalists and few species are restricted to anthropogenic habitats.

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References

- BERG M.P. & WIJNHOFEN H., 1997. - Landpissebedden. *Wetenschappelijke Mededeling K.N.N.V.*, 221: 1–80.
- BLOWER J.G., 1985. - *Millipedes*. The Linnean Society of London. Synopses of the British Fauna (New Series). No. 35. E.J. Brill/Dr. W. Backhuys, London-Leiden-Köln-Kopenhagen, 242pp.
- DE SMEDT P., BOERAËVE P., ARIJS G. & SEGERS S., 2020. - *De landpissebedden van België (Isopoda: Oniscoidea)*. Spinicornis, Bonheiden, 148pp.
- DE SMEDT P., BOERAËVE P., ARIJS G., SEGERS S., LAMBRECHTS J. & MAES D., 2022. - A Red List of terrestrial isopods (Isopoda: Oniscoidea) in Flanders (northern Belgium) and its implications for conservation. *Journal of Insect Conservation*, 26: 525–535.
- DRUMONT A., RAEMDONCK H., DAHAN L., DELBOL M. & KUHN A., 2020. - Note sur la présence en Belgique de *Ferreria marqueti* (Aubé, 1863) (Insecta, Coleoptera, Curculionidae). *Le Coléoptériste*, 23(1): 19–23.
- EDWARDS C.A., 1959. - A revision of the British Symphyla. *Proceedings of the Zoological Society of London*, 132: 403–439.
- EGGERS T.O. & MARTENS A., 2001. - Bestimmungsschlüssel der Süßwasser-Amphipoda (Crustacea) Deutschlands. *Lauterbornia*, 42: 1–68.
- HAUSER H. & VOIGHTLANDER K., 2019. - *Doppelfüßer (Diplopoda) Deutschlands*. Deutsche Jugendbund für Naturbeobachtung, Senger Druck, Augsburg, 84pp.
- HENRARD A., BAERT L., DE SMEDT P., GARDINI G., VANHERCKE L., JOCQUÉ R., OGER P., KEKENBOSH R., VAN NIEUW ENHOVE C., LOCK K. & DRUMONT A., 2022. - On the arachnofauna of the Jean Massart Botanical Garden (Brussels-Capital Region, Belgium). *Journal of the Belgian Arachnological Society*, 37(2): 122–137.
- HOPKIN S.P., 2007. - *A key to the Collembola (Springtails) of Britain and Ireland*. Field Studies Council AIDGAP, Shrewsbury, 245pp.
- IORIO E. & LABROCHE A., 2015. - Les chilopodes (Chilopoda) de la moitié nord de la France: toutes les bases pour débiter l'étude de ce groupe et identifier facilement les espèces. *Invertébrés armoricains*, 13: 1–106.
- KIME R.D., 2004. - The Belgian millipede fauna (Diplopoda). *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, Entomologie*, 74: 35–68.
- LOCK K., 2001. - *Voorlopige atlas van de duizendpoten van België (Myriapoda, Chilopoda)*. I.N. en K.B.I.N., Rapport Instituut voor Natuurbehoud 2000/19, Brussel, 40pp. / *Preliminary atlas of the centipedes of Belgium (Myriapoda, Chilopoda)*. I.N. and K.B.I.N., Report Institute of Nature Conservation 2000/19, Brussels, 40pp.
- LOCK K., 2007. - *Haplophthalmus montivagus* Verhoeff, 1940: a new species for Belgium (Isopoda Trichoniscidae). *Bulletin S.R.B.E./K.B.V.E.*, 143: 22–25.
- LOCK K., 2009. - Diplura of Belgium. *Bulletin S.R.B.E./K.B.V.E.*, 145: 35–39.
- LOCK K., 2010a. - Symphyla of Belgium. *Entomologie faunistique - Faunistic Entomology*, 62: 25–27.
- LOCK K., 2010b. - Updated checklist of the Belgian centipedes (Chilopoda). *Entomologie faunistique - Faunistic Entomology*, 62: 35–39.
- LOCK K., ADRIAENS T. & STEVENS M., 2010. - Distribution and ecology of the Belgian *Campodea* species (Diplura: Campodeidae). *European Journal of Soil Biology*, 46: 62–65.
- PROESMANS W. & DE SMEDT P., 2015. - The millipede *Cylindroiulus britannicus* (Verhoeff, 1891) new for the Belgian fauna (Diplopoda: Julidae). *Bulletin S.R.B.E./K.B.V.E.*, 151: 239–242.

Hypoponera eduardi (Forel, 1894) (Hymenoptera: Formicidae) on extensive green roofs in the Province of Antwerp: a new species for the Belgian ant fauna

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Abstract

From 2019 until 2021, we investigated extensive green roofs in Flanders (Belgium) for their arthropod communities. On two different roofs we found, amongst the collected specimens, a species new for the Belgian ant fauna: *Hypoponera eduardi* (Forel, 1894). The presence of multiple worker ants belonging to this species indicates that it has formed a colony on at least one roof. Apparently, the warm and dry conditions that arise on extensive green roofs as a consequence of the shallow substrate layers lead to suitable habitat conditions for this species.

Keywords: *Hypoponera*, green roofs, ants

Samenvatting

Van 2019 tot en met 2021 hebben we onderzoek uitgevoerd naar geleedpotigen op extensieve groendaken in Vlaanderen (België). Op twee verschillende daken troffen we, tussen de geïdentificeerde soorten, een nieuwe soort voor België aan: *Hypoponera eduardi* (Forel, 1894). De aanwezigheid van meerdere wersters duidt erop dat er zich een kolonie ontwikkeld heeft op minstens één groendak. Het lijkt erop dat de warme en droge omstandigheden die kunnen optreden op deze groendaken als gevolg van de dunne substraatlagen gunstig zijn voor deze soort.

Résumé

Nous avons inventorié les communautés d'arthropodes des toits végétalisés en Flandres (Belgique) de 2019 à 2021. Parmi les spécimens récoltés, *Hypoponera eduardi* (Forel, 1894), une espèce de Formicidae encore jamais répertoriée en Belgique, a été trouvée sur deux toits différents. La présence de nombreuses ouvrières de cette espèce indique la présence d'une colonie sur au moins un toit. Il semble que la combinaison de températures élevées et de faible humidité de l'écosystème du toit végétalisé engendrent un habitat propice au développement de cette espèce.

Introduction

Green roofs, or vegetated roofs, are becoming more popular in Belgium (VAN DRIESCHE, 2021). They contribute to the mitigation of some of the problems associated with urbanization, such as reducing heat islands effects, retaining storm water, or increasing local biodiversity (OBERNDORFER *et al.*, 2007; WILLIAMS *et al.*, 2014; FRANCIS, 2017; NGUYEN *et al.*, 2022).

Most of the installed green roofs are so-called extensive green roofs. This type of green roof is characterized by drought-tolerant plant species, mainly species of *Sedum*, planted in a thin layer of porous, mineral substrate ($\pm$ 5cm). Its popularity arises from the fact that they require