New Disease Reports

First report of *Coleosporium montanum* on *Symphyotrichum* in Austria and Europe

H. Voglmayr [1,2]*, I. Krisai-Greilhuber [1] and T. Kirisits [2]

[1] Department of Botany and Biodiversity Research, University of Vienna, Rennweg 14, 1030 Wien, Austria ; [2] Institute of Forest Entomology, Forest Pathology and Forest Protection, Dept. of Forest and Soil Sciences, University of Natural Resources and Life Sciences Vienna (BOKU), Peter-Jordan-Straße 82, 1190 Vienna, Austria

*E-mail: hermann.voglmayr@boku.ac.at

Received: *24 Nov 2020.* ***Published:*** *23 Dec 2020.* ***Keywords:*** *New England aster, obligate parasite, rust fungus, Pucciniales*

North American species of the genus *Symphyotrichum* ('asters' or 'Michaelmas daisies') are popular, widely cultivated ornamentals, some of which have become invasive and widely naturalised in Europe, posing threats to natural ecosystems.

A rust fungus was collected in October 2017 on naturalised *S. lanceolatum* in Baumgarten an der March, Lower Austria (voucher specimen WU 43136 deposited in the fungarium of the University of Vienna), and in October 2020 on *S. novae-angliae* in a garden in St. Willibald, Upper Austria (voucher specimen WU 43601). Infected plants displayed chlorotic spots on the upper leaf surfaces and uredinia with powdery urediniospores on the lower leaf surfaces and stems (Figs. 1-3). Urediniospores were ellipsoid to oblong-ellipsoid, polyangular, verrucose, 29-34 × 19-22 µm (Fig. 4). Based on these characteristics and the hosts, the rust fungus was identified preliminarily as *Coleosporium montanum* (McTaggart & Aime, 2018).

To confirm the species identification, we sequenced the ITS2-LSU and the LSU regions of samples WU 43601 and WU 43136, respectively. DNA was extracted from uredinia using an innuPREP DNA Micro Kit (Analytik Jena, Germany) following the manufacturer's instructions, with a lysis time of 20 hours. The ITS2-LSU and LSU were amplified and sequenced with primer pairs RUST2inv - LR5 and Rust28SF - LR5, respectively (McTaggart & Aime, 2018 and references therein). The obtained sequences were deposited in GenBank (Accession Nos. MW284588, MW284589). An nBLAST analysis revealed 99.7-100% identity to sequences of *C. montanum*. In a molecular phylogenetic analysis, the collections were placed in a subclade of *C. montanum* composed of North American and Korean accessions from *Symphyotrichum* hosts (Fig. 5).

Coleosporium montanum is native to North America and has been introduced into Asia (McTaggart & Aime, 2018). To our knowledge, our records are the first for Europe, but there were a few recent Central European records from *Symphyotrichum* spp. that were likely misidentified as *C. asterum* (Scheuer, 2015; Ellis, 2020). Sequence differences between *C. montanum* accessions from *Symphyotrichum* and *Solidago* (Fig. 4) indicate that it may contain two host-specific cryptic species (McTaggart & Aime, 2018). So far, from Europe, only the closely related *C. solidaginis* has been confirmed from *Solidago* spp. (Beenken *et al.*, 2017). No *C. montanum* teliospores were seen, but they were reported for an Austrian collection (as *C. asterum*) from *S. lanceolatum* (Scheuer, 2015). Occurrences on potential alternate hosts, 2- or 3-needled pines (*Pinus* spp.), are as yet unknown in Europe. As the disease was observed only late in the season, it may have a minor impact on its *Symphyotrichum* hosts, but may affect their ornamental horticultural value.

Acknowledgements

The authors thank Thomas Barta for communicating specimen WU 43136. Financial support for updating the inventory of alien fungal species for Austria by the Federal Environment Agency in the Austrian Program for Rural Development 2014-2020 is gratefully acknowledged. The new record is also associated with the ABOL project.

References

1. Beenken L, Lutz M, Scholler M, 2017. DNA barcoding and phylogenetic analyses of the genus *Coleosporium* (Pucciniales) reveal that the North American goldenrod rust *C. solidaginis* is a neomycete on introduced and native *Solidago* species in Europe. *Mycological Progress* **16**, 1073-1085. http://dx.doi.org/10.1007/s11557-017-1357-2
2. Ellis WN, 2020. *Coleosporium asterum* (Dietel) Sydow & Sydow, 1914. In: Plant Parasites of Europe - Leafminers, Galls and Fungi. https://bladmineerders.nl/parasites/fungi/basidiomycota/pucciniomycotina/pucciniales/coleosporiaceae/coleosporium/coleosporium-asterum. Accessed 24 November 2020.
3. McTaggart AR, Aime MC, 2018. The species of *Coleosporium* (*Pucciniales*) on *Solidago* in North America. *Fungal Biology* **122**, 800-809. http://dx.doi.org/10.1016/j.funbio.2018.04.007
4. Scheuer C, 2015. Mycotheca Graecensis, Fasc. 25 (Nos 481-500). *Fritschiana* **79**, 1-9.

Figure 1

Figure 2

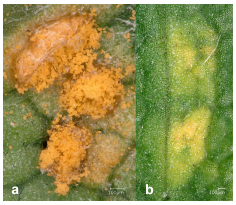

Figure 3

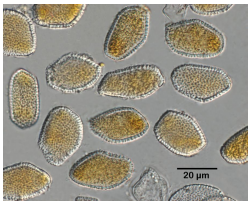

Figure 4

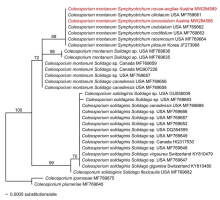

Figure 5

To cite this report: Voglmayr H, Krisai-Greilhuber I, Kirisits T, 2020. First report of *Coleosporium montanum* on *Symphyotrichum* in Austria and Europe. *New Disease Reports* **42**, 24. http://dx.doi.org/10.5197/j.2044-0588.2020.042.024

This report was published on-line at www.ndrs.org.uk where high quality versions of the figures can be found.