Contribution to the *Antrodiella americana* species complex (Basidiomycota, Polyporales)

Jiří Kout¹, Josef Vlasák², Viacheslav Spirin³

¹Department of Biology, Geosciences and Environmental Education, Faculty of Education, University of West Bohemia, Klatovská 51, Plzeň, CZ-306 19, Czech Republic; martial@seznam.cz
²Biology Centre of the Academy of Sciences of the Czech Republic, Institute of Plant Molecular Biology, Branišovská 31, České Budějovice, CZ-370 05, Czech Republic; vlasak@unbr.cas.cz
³Botanical Museum, P.O. Box 7, FI-00014 University of Helsinki, Finland; slava_spirin@mail.ru

*corresponding author


Two recently described polypores, *Antrodiella niemelaei* and *A. chinensis*, are newly reported from the Russian Far East and the first of them also from the Czech Republic, Central Europe. The correctness of the identification of both species was confirmed by sequencing of ribosomal DNA. *Antrodiella chinensis* is reported as a record new to Russia. *Antrodiella niemelaei* was collected on dead fruitbodies of *Hymenochaete intricata* and *H. tabacina*. Photographs of both species are presented.

**Key words:** polypores, Basidiomycota, taxonomy, ecology.


Outkovečky *Antrodiella niemelaei* a *A. chinensis* jsou nově zaznamenány z ruského Dálného východu a první z nich také z České republiky. Správnost určení obou druhů byla potvrzena sekvenováním ribozomální DNA. *Antrodiella chinensis* je novým druhem pro Rusko. *Antrodiella niemelaei* byla sbírana na odumřelých plodnicích kožovek *Hymenochaete intricata* a *H. tabacina*. Jsou prezentovány fotografie obou druhů.

**INTRODUCTION**

*Antrodiella niemelaei* Vampola & Vlasák and *A. chinensis* H.S. Yuan belong to the *A. americana* complex and have been separated from *Antrodiella americana* Ryvarden & Gilb. recently (Vampola & Vlasák 2011, Yuan 2013). The whole group of species around *A. americana* is characterised by their ecology. They all belong to so-called successor species (Niemelä et al. 1995, Piątek 2001) inhabiting wood decayed by some other fungi, in this case specifically of the family *Hymenochaetaceae*. Three geographically separated species are recognised: *Antrodiella*

In this article, we present new records of A. niemelaei and A. chinensis from the Russian Far East and the first one also for the first time from the Czech Republic (Central Europe). Our identifications were supported by ribosomal DNA analysis.

MATERIAL AND METHODS

The specimens of Antrodiella niemelaei and A. chinensis, collected in the Czech Republic and Russia, are deposited in the Botanical Museum, University of Helsinki (H), Mycological Department of the National Museum, Prague (PRM), as well as the Mycological Herbarium of the Department of Biology, University of West Bohemia, Pilsen, Czech Republic (abbreviated KBI here) and the private herbarium of J. Vlasák (abbreviated JV). For acronyms of public herbaria, see Thiers (on-line).

A microscopic study was made in Cotton Blue and Melzer’s reagent using an Olympus BX 51 light microscope. We measured the pore size values of 2 specimens of Antrodiella americana (CFMR specimens), 2 specimens of A. chinensis (Spirin 5088, 6612) and 7 specimens of A. niemelaei (Ryvarden 28822, Toresson 19980911, holotype, Parmasto 154386, Spirin 5839, 4828, 4870); 20 measurements from each specimen in total.

For DNA methods, see Vlasák & Kout (2011). The phylogram analysis was carried out as presented in Vampola & Vlasák (2011); A. semisupina, A. pallescens and A. romellii were used as outgroup (specimens used for the DNA study, see Tab. 1). There were a total of 586 positions in the final alignment, of which 85 were variable and 74 parsimony informative.

RESULTS AND DISCUSSION

Antrodiella niemelaei was described based on specimens from Northern Europe (Vampola & Vlasák 2011), but here it is reported from the Czech Republic, Central Europe and also from the Russian Far East, Asia. The locality in the Czech Republic, Petrovka Nature Reserve, is a protected site in a humid alder valley, where the Alnus-dominated communities have a cooler climate than the surrounding pine forests. In the Russian Far East (Khabarovsk Reg.) Antrodiella niemelaei occurs in mixed forests in Bolshoi Khekhtsir Nature Reserve (highland areas, alt. 800–1000 m), occupying dead basidiocarps of Hymenochaete intricata (Lloyd) S. Ito on dead branches of Acer ukurunduense.
Antrodiella chinensis is reported here as new to Russia. It was found in the Russian Far East, where also its close relative Antrodiella niemelaei occurs (at the same locality). Antrodiella americana remains limited to the North American continent (Vampola & Vlasák 2011), nevertheless we expect other Antrodiella species there as well (e.g. on fruitbodies of Hydnochaete genus).

Six sequences of rDNA ITS regions of Antrodiella niemelaei specimens were generated during this study to confirm our identifications. We demonstrated high sequence similarity (99–100% concordance) of A. niemelaei specimens from Fennoscandia, Central Europe and East Asia, as well as its close affinity to A. americana, which shows, however, much higher sequence diversity (Fig. 1). More North American specimens are needed to study this unexpected variability. Antrodiella chinensis forms a rather distant clade, belonging, nevertheless, to the Hymenochaete-successor subclade. Typical Antrodiella species (not connected to Hymenochaete-colonised wood) – A. semisupina, A. pallescens and A. romellii – are clustered separately from the Hymenochaete-successor subclade of Antrodiella species.

### Tab. 1. Specimens used in phylogenetic relationships.
(The first two GenBank records of Antrodiella americana have probably not been published. Other GenBank numbers without reference are published in this paper, see Specimens examined.)

<table>
<thead>
<tr>
<th>Species</th>
<th>Country</th>
<th>Herbarium specimen/culture</th>
<th>GenBank Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antrodiella americana</td>
<td>USA</td>
<td>L 3468</td>
<td>EU232185</td>
</tr>
<tr>
<td>Antrodiella americana</td>
<td>USA</td>
<td>HIB 4100-Sp</td>
<td>EU232186</td>
</tr>
<tr>
<td>Antrodiella americana</td>
<td>USA</td>
<td>JV 0109/37</td>
<td>JN592510</td>
</tr>
<tr>
<td>Antrodiella americana</td>
<td>China</td>
<td>Dai 8874</td>
<td>JX110843</td>
</tr>
<tr>
<td>Antrodiella americana</td>
<td>China</td>
<td>Dai 9010</td>
<td>JX110844</td>
</tr>
<tr>
<td>Antrodiella americana</td>
<td>Russia</td>
<td>SP 6612</td>
<td>KF963616</td>
</tr>
<tr>
<td>Antrodiella niemelaei</td>
<td>Finland</td>
<td>Renvall 3218</td>
<td>AF126876</td>
</tr>
<tr>
<td>Antrodiella niemelaei</td>
<td>Finland</td>
<td>Haikonen 14727</td>
<td>AF126877</td>
</tr>
<tr>
<td>Antrodiella niemelaei</td>
<td>Sweden</td>
<td>KH Larsson 11949</td>
<td>JN710509</td>
</tr>
<tr>
<td>Antrodiella niemelaei</td>
<td>Czech Republic</td>
<td>KBI 0903/13</td>
<td>KF963615</td>
</tr>
<tr>
<td>Antrodiella niemelaei</td>
<td>Russia</td>
<td>SP 4828</td>
<td>KF963610</td>
</tr>
<tr>
<td>Antrodiella niemelaei</td>
<td>Russia</td>
<td>SP 4870</td>
<td>KF963611</td>
</tr>
<tr>
<td>Antrodiella niemelaei</td>
<td>Russia</td>
<td>SP 5839</td>
<td>KF963612</td>
</tr>
<tr>
<td>Antrodiella niemelaei</td>
<td>Russia</td>
<td>SP 6625</td>
<td>KF963614</td>
</tr>
<tr>
<td>Antrodiella niemelaei</td>
<td>Russia</td>
<td>SP 6565</td>
<td>KF963613</td>
</tr>
<tr>
<td>Antrodiella pallescens</td>
<td>Finland</td>
<td>Miettinen 13611</td>
<td>FN907921</td>
</tr>
<tr>
<td>Antrodiella romellii</td>
<td>Finland</td>
<td>Saarenkoski 34286</td>
<td>AF126901</td>
</tr>
<tr>
<td>Antrodiella romellii</td>
<td>Finland</td>
<td>Renvall 3901</td>
<td>AF126902</td>
</tr>
<tr>
<td>Antrodiella semisupina</td>
<td>Canada</td>
<td>Labrecque &amp; Labbé 372</td>
<td>JN710521</td>
</tr>
</tbody>
</table>
In addition to geographic distribution and rDNA sequences, pore size is a good species character in the *A. americana* complex (Figs. 2–4), which was already stated in some earlier publications (Vampola & Vlasák 2011, Yuan 2013). *Antrodiella niemelaei* has small pores, approx. 4 per mm, *A. americana* medium pores 1–3 per mm, and *A. chinensis* has large pores, 1–2 per mm in our specimens, but 0.5–1.5 per mm in the original description (Yuan 2013). The above pore size values are measured in young and well-developed basidiocarps. In the case of drying and older fruitbodies disruption or deformation of the pores can sometimes occur, which may alter the measured values.

Photographs of fresh basidiocarps of *A. chinensis* and *A. niemelaei* are presented in Figs. 5 and 6.
KOUT J., VLASÁK J., SPIRIN V.: CONTRIBUTION TO THE *ANTRODIELLA AMERICANA* SPECIES COMPLEX

Fig. 2. Pore density in *Antrodiella americana*.

Fig. 3. Pore density in *Antrodiella chinensis*.

Fig. 4. Pore density in *Antrodiella niemelaei*.
Fig. 5. *Antrodiella chinensis*, Russia (Khabarovsk Reg.), on *Betula lanata*, 3 Sept. 2013 (Spirin 6612). Bar = 1 cm. Photo by V. Spirin.

Fig. 6. *Antrodiella niemelaei*, Russia (Leningrad Reg.), on *Salix caprea* and *Hymenochaete tabacina*, 28 July 2012 (Spirin 4828). Bar = 1 cm. Photo by V. Spirin.
Specimens examined

**Antrodiella americana:**

**Antrodiella chinensis:**

**Antrodiella niemelaei:**

**REFERENCES**
