Taxonomic Re-Evaluation of Korean *Laccaria*

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The genus *Laccaria* (Hydnangiaceae, Basidiomycota) contains around 75 species, which are found in both tropical and temperate regions of the world. *Laccaria* plays an important role in forest ecosystems as ectomycorrhizal fungi, helping plants effectively uptake nutrients. The genus *Laccaria* appears to be associated with plants and has been used to aid forest recovery projects by improving seedlings growth. In Korea, 9 *Laccaria* species have been reported based on morphological work done between 1978-1996. Exact identification and exploiting uncovered *Laccaria* species is necessary for industrial application and efficient forest management. Our goal was to re-evaluate the diversity of Korean *Laccaria* using molecular phylogenetic methods. We used three loci (ITS, rLSU and rpb2) for single and multigene phylogenetic analyses using 364 specimens (RDA and Seoul National University) collected between 1981 and 2014. From our analyses, we identified 9 species -- 5 previously reported, 2 new to Korea, and 2 potentially new species. When morphological characteristics of the specimens were examined, the possibility of incorrect identification was significant due to considerable overlap between characters. Our study shows that misidentification based on morphology can be high and that the application of molecular methods is necessary for correct identification.

Taxonomic Re-evaluation of *Lactarius* subgenus *Russularia* in Korea Based on Morphological Features and Phylogenetic Analysis

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The genus *Lactarius*, characterized by the unique ability to exude a milky fluid when bruised, is a well known and widely distributed genus of basidiomycetes. Species of *Lactarius* subg. *Russularia* are morphologically well-characterized by a small to medium-sized cap which is dry, rarely sticky and has a dominant reddish-brown or orange color. Seven species of this subgenus have been reported in Korea: *L. camphoratus*, *L. obscratus*, *L. oomphaiformis*, *L. quietus*, *L. subdulcis*, *L. suzonarius* and *L. theiogalus*. In this study, we re-evaluated the Korean inventory of *Lactarius* subg. *Russularia* through DNA barcoding. Three barcoding markers (ITS, LSU, and rPB2) were sequenced for 89 specimens obtained from Seoul National University Fungus Collection (SFC), Korea National Arboretum (KA) and the National Academy of Agricultural Sciences (HCCN). Molecular phylogenetic analyses with morphology based confirmation recovered 9 species, where only 2 species corresponded to the previously known Korean species. Remaining 7 species were undescribed species. Our data show that most species in Korea are conspecific with any taxon from America and Europe in spite of very similar morphology. The results of this study suggest that there are more Korean species awaiting discovery.

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