

Ascomycete Japonicae Exsiccati, Fascicle 2, Nos. 11–20

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Abstract Ten sets of specimens of fungi, each composed of ten taxa were prepared to introduce fungal biodiversity to overseas herbaria including CAS, CUP, DAVFP, FH, GZU, PDD, and TUR. The specimens are accompanied with cultures deposited in a culture collection, tissue samples, and extracted DNA samples when available.

Keywords: ascomycetes, biodiversity, discomycetes, exsiccata, mycobiota.

Introduction

This is the second fascicle following the previous fascicle (Hosoya *et al.*, 2019) of the occasional series to introduce discomycetes and other mycobiota in Japan in exsiccatae. The specimens provided here are accompanied with isolates, tissue samples, extracted DNA samples, and registered sequences whenever possible. The isolates were deposited to NITE BioResource Center (<https://www.nite.go.jp/en/nbrbc/cultures/index.html>). Isolation, cultivation, methods for DNA extraction to sequence followed Itagaki *et al.* (2019). Isolates were deposited to Biological Resource Center, National Institute of Technology and Evaluation (NITE-BRC). Tissue samples and extracted DNA were deposited to Center for Molecular Biodiversity Research, National Museum of Nature and Science for collaborative research. DNA sequences were deposited to DDBJ (<https://www.ddbj.nig.ac.jp/index-e.html>) or UNITE (<https://unite.ut.ee/>). Coordinates follow WGS84 datum.

1. *Aleuria aurantia* (Pers.) Fuckel

On the *Abies firma* forest floor, Yammba Nature Park, Naganohara, Agatsuma-gun, Gunma Pref. (+36.539082, +138.928146). 2020-X-12. Collected by Tsuyoshi Hosoya and Hiyori Itagaki. Identified by Tsuyoshi Hosoya. Duplicate of TNS-F-91318.

Note: This is a common species that is widely distributed in Japan. The internal transcribed spacer and 5.8S ribosomal DNA region (ITS-5.8S) sequence obtained from the present specimen (LC619223) showed >98.5% similarity with the previously registered sequences from strain or voucher specimens of *A. aurantia* (KX449456, MN992569, MK575463, DQ491495) by basic local alignment tool (BLAST) search.

2. *Arachnopeziza delicatula* Fuckel

On unidentified rotten wood, Atsubetsu, Atsubetsu-ku, Sapporo-shi, Hokkaido (+43.021208, +141.482246). 2020-VIII-3. Collected by Tsuyoshi Hosoya and Hiyori Itagaki. Identified by Tsuyoshi Hosoya. Duplicate of TNS-F-86287 (culture NBRC 115014).

Note: This is a common species that mainly occurs on deciduous wood. The ITS-5.8S

sequence of this material (LC619224) was identical with that of a previously collected *A. delicatula* specimen (TNS-F-12770, JN033433), and showed high similarity >98.5% with other *A. delicatula* sequence (MT231651) cited in Kosonen *et al.* (2021). The species superficially resembles *A. aurata* in morphology (Korf, 1951), but Kosonen *et al.* (2021) demonstrated that the two species are phylogenetically distantly related. In Japan, we have more specimens identified as *A. aurata* than those identified as *A. delicatula*, but the former may include potential *A. delicatula*. There is a trend to accept *Gorgoniceps delicatula* (Fuckel) Höhn. as a correct name for *A. delicatula* (<http://www.speciesfungorum.org/Names/SynSpecies.asp?RecordID=262927> (accessed on 12 March 2011), but we accept *Arachnopeziza* as an appropriate genus to accommodate this species based on the detailed molecular phylogenetic analysis by Kosonen *et al.* (2021).

3. *Brunnipila clandestina* (Bull.) Baral

On dead twigs of *Rubus idaeus*, Engaru-cho, Okhotsk subprefecture, Hokkaido. 2018-VII-14. Collected and identified by Yukito Tochihara. Duplicate of TNS-F-81486 (culture NBRC 113939).

Note: The present fungus was described in detail based on the present specimen in Tochihara *et al.* (2019). The ITS-5.8S sequence was registered to UNITE as UDB0779084.

4. *Bulgaria inquinans* (Pers.) Fr.

On *Quercus crispula* bark, Ogawa, Sekimoto-cho, Kita-ibaraki-shi, Ibaraki Pref. (+36.939483, +140.587203). 2020-VI-10. Collected by Tsuyoshi Hosoya and Yukito Tochihara. Identified by Tsuyoshi Hosoya. Duplicate of TNS-F-223906 (culture NBRC 115011).

Note: *Bulgaria inquinans* is well-known for its characteristic morphology. The ITS-5.8S sequence of the culture from the present specimen (LC619225) showed identical sequence with voucher specimens or strains (e.g., KY633576 from DAOM 240100, KY633580 from DAOM 145165, KJ663832 from strain CBS129.58,

AY789345 from strain ZW-Geo52-Clark).

5. *Gelatinipulvinella astraicola* Hosoya & Y.Otani

On inner surface of *Astraeus hygrometricus* cortex, Lake Shikotsu-ko, Chitose-shi, Hokkaido (+42.741878, +141.402161). 2020-VIII-4. Collected by Tsuyoshi Hosoya and Hiyori Itagaki. Identified by Tsuyoshi Hosoya. Duplicate of TNS-F-60536 (culture NBRC 115012).

Note: *Gelatinipulvinella astraicola* is characterized by its unique fungicolous habitat and yeast-like asexual state. Since its first report (Hosoya and Otani, 1995), the occurrence has been widely known in Japan. The closest affinity with the ITS-5.8S sequence of this isolate (LC619226) was *Gelatinopsis fungicola* (Kirschst.) Baral with the similarity of 93–94% based on BLAST search. This is reasonable based on the morphological resemblance.

6. *Helvella elastica* Bull.

On ground, Tsukuba Botanical Garden, Tsukuba, Ibaraki Pref. (+36.100696, +140.11198). 2020-X-28. Collected by Tsuyoshi Hosoya. Identified by Tsuyoshi Hosoya. Duplicate of TNS-F-91339.

Note: *Helvella elastica* is known from a wide area in Japan, and the present specimen shows the typical morphology for the fungus recognized as *H. elastica* in Japan. However, the ITS-5.8S sequence (LC619227) showed rather low similarity with those stored in GenBank (88–90%), and only unidentified *Helvella* sequences (LC098743) showed the highest similarity of 98% as a result of BLAST search. As discussed by Skrede *et al.* (2017), ITS-5.8S region in this genus may be too diverse to define a species.

7. *Hyphopeziza pygmaea* (Mouton) J.G.Han, Hosoya & H.D.Shin

On *Quercus crispula* leaf, Kakuma, Sanadachi, Ueda-shi, Nagano Pref. (+36.455075, +138.35878). 2015-VI-4. Collected by Tsuyoshi Hosoya. Identified by Tsuyoshi Hosoya. Duplicate of TNS-F-61910 (culture NBRC 115009).

Note: The fungus was originally described as

Hyalopeziza pygmaea by Hosoya and Otani (1997), and examined by Han *et al.* (2014) to be recognized as a member of a new monotypic genus. It is common on *Quercus crispula* in spring in Japan. The ITS-5.8S sequence from the present specimen (LC619228) showed >98.5% similarity with vouchers KUS-F51564 and TNS-F-17940, showing the conservative nature of the region for this fungus.

8. *Purpureocillium atypicola* (Yasuda) Spatafora, Hywel-Jones & Luangsa-ard

On Antrodiaetidae, Hiroshima-shi Plant Park, Kurashige, Saeki-ku, Hiroshima-shi, Hiroshima Pref. (+34.394111, +132.345167). 2011-VII-10. Collected by Toshikazu Imoto. Identified by Tsuyoshi Hosoya. Duplicate of TNS-F-39273 (culture NBRC 115008).

Note: The ITS-5.8S sequence from the isolate of the present specimen (LC619229) showed 100% match with *Cordyceps cylindrica* Petch (LC008213), regarded as the sexual state of *P. atypicola* (Spatafora *et al.*, 2015).

9. *Taphrina truncicola* Kusano

On *Cerasus maximowiczii* peduncle, Sugadaira Montane Research Center, Tsukuba University, Ueda-shi, Nagano Pref. (+36.524947, +138.347047). 2019-VI-9. Collected by Tsuyoshi Hosoya. Identified by Tsuyoshi Hosoya. Duplicate of TNS-F-88648 (culture NBRC 115010).

Note: The ITS-5.8S sequence obtained for this strain (LC619230) shows significant differences with sequences of other *Taphrina* species currently registered in GenBank, and justifies its specific distinction by molecular evidence.

10. *Tarzetta catinus* (Holmsk.) Korf & J.K.Rogers

On ground, Yamanouchi-machi, Shimotakai-gun, Nagano Pref. (+36.709333, +138.49647). 2011-VI-30. Collected by Tsuyoshi Hosoya. Identified by Tsuyoshi Hosoya. Duplicate of TNS-F-91388.

Note: Although this fungus is common in the *Fagus crenata* forest in Japan, its occurrence is

not reported in academic literature in Japan. *Tarzetta catinus* is common in Europe and America and more than 2,000 occurrences has reported (GBIF.org, 29 December 2020). The ITS-5.8S sequence from the present specimen (LC619231) showed the highest similarity (99.65%) with *Tarzetta cf. catinus* isolate AH:53705 (MN712325), but there was no identical sequence in GenBank. Several sequences with higher similarity (>98.5%) labeled as *T. catinus* were also found.

References

- GBIF.org (29 December 2020) GBIF Occurrence Download. <https://doi.org/10.15468/dl.e3ae4t> [Accessed 1 May 2021].
- Han, J. G., Hosoya, T., Sung, G. H. and Shin, H. D. 2014. Phylogenetic reassessment of Hyaloscyphaceae sensu lato (Helotiales, Leotiomycetes) based on multigene analyses. *Fungal Biology* 118: 150–167.
- Hosoya, T. and Otani, Y. 1995. *Gelatinipulvinella astraeicola* gen. et sp. nov., a fungicolous discomycete and its anamorph. *Mycologia* 87: 689–696.
- Hosoya, T. and Otani, Y. 1997. Hyaloscyphaceae in Japan (2): Glassy-haired members of the tribe Hyaloscyphaceae. *Mycoscience* 38: 187–205.
- Hosoya, T., Tochihara, Y. and Itagaki, H. 2019. Ascomycete Japonicae Exsiccati, fascicle 1, nos. 1–10. *Bulletin of the National Museum of Nature and Science, Series B* 45: 103–106.
- Itagaki, H., Nakamura, Y. and Hosoya, T. 2019. Two new records of ascomycetes from Japan, *Pyrenopeziza protrusa* and *P. nervicola* (Helotiales, Dermateaceae sensu lato). *Mycoscience* 60: 189–196.
- Korf, R. P. 1951. Monograph of Arachnopezizaceae. *Lloydia* 14: 129–186.
- Kosonen, T., Huhtinen, S. and Hansen, K. 2021. Taxonomy and systematics of Hyaloscyphaceae and Arachnopezizaceae. *Persoonia* 46: 26–62.
- Skrede, I., Carlsen, T. and Schumacher, T. 2017. A synopsis of the saddle fungi (*Helvella*: Ascomycota) in Europe—Species delimitation, taxonomy and typification. *Persoonia* 39: 201–253.
- Spatafora J. W., Quandt C. A., Kepler, R. M., Sung, G.-H., Shrestha, B., Hywel-Jones, N. L. and Luangsa-ard, J. J. 2015. New 1F1N species combinations in Ophiocordycipitaceae (Hypocreales). *IMA Fungus* 6: 357–362.
- Tochihara, Y., Sasagawa, R. and Hosoya, T. 2019. Enumeration of Remarkable Japanese Discomycetes (11): Notes on three species of Lachnaceae new to Japan with one new combination. *Bulletin of the National Museum of Nature and Science, Series B* 45: 47–55.