



Type study of *Lachnum japonicum*: a new combination proposal with lectotypification

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Abstract

Type specimen of *Lachnum japonicum* Syd. & P. Syd. was discovered in the National Museum of Nature and Science (TNS). Based on the morphological reexamination of it, the species was transferred to the genus *Trichopezizella*. *Trichopezizella japonica* comb. nov. was proposed and the specimen was designated as lectotype.

Keywords: isosyntype, Japan, Lachnaceae, TNS, *Trichopezizella*

Introduction

The genus *Lachnum* Retzius (1769: 255) (Lachnaceae, Helotiales, Ascomycota) is typically characterized by stipes, hairs wholly equipped with granules, lanceolate paraphyses and ectal excipulums composed of *textura prismatica* (Hosoya *et al.* 2010). *Lachnum* is a highly diverse genus embracing more than 250 species (Index Fungorum 2019, Kirk *et al.* 2008), but some species described before mid-20th century do not match with the general concept mentioned above and should be transferred to proper genera.

Lachnum japonicum Syd. & P. Syd. (1912: 409) was originally described by Sydow & Sydow (1912) based on specimens collected by K. Hara in 1912 in Japan, Mino prov., Kawauye-mura (currently Japan, Gifu pref., Nakatsugawa city), on dead stems of *Boehmeria nivea*. *Lachnum japonicum* was mentioned a few times only by Hara himself (Hara 1912, 1936, 1954) citing an original description. He regarded *L. japonicum* as a plant pathogen (Hara 1936) and named it Kuro-hina-no-chawan-take in Japanese meaning a small and black cup-shaped fungus (Hara 1954). In the original description, Sydow & Sydow (1912) pointed out *L. japonicum* had ‘sordide flavis vel flavo-brunneis’ (=dull yellow to yellow-brown) and ‘lenissime asperulis’ (=mildly rough) hairs, indicating the presence of granules on hair surface. In the present concept, brown and granulate hairs are characteristic not of *Lachnum* but of other lachnaceous genus *Brunnipila* Baral (in Baral & Krieglsteiner 1985: 49) (Baral & Krieglsteiner 1985, Hosoya *et al.* 2010). Since the original description was not clear especially about the hair morphology, type study had been required to determine the generic position of *L. japonicum*. However, no type specimens were designated in the original description (Sydow & Sydow 1912) and specimens used in it have long been missing.

Since specimen information in the mycological herbarium of the National Museum of Nature and Science where both authors work (TNS, Tsukuba, Ibaraki, Japan) has been databased in the last 15 years, some type specimens collected in Japan that had been believed lost were discovered in TNS (Shirouzu & Hosoya 2017). As a result of searching ‘*Lachnum japonicum*’ in the TNS herbarium database, one specimen record **TNS-F-209717** was discovered and we checked the corresponding specimen was surely stored in the designated shelf. In the Global Biodiversity Information Facility (GBIF, <http://www.gbif.org/>) database, another specimen record **S-Fungi F6259** in the herbarium of the Swedish Museum of Natural History was also registered (GBIF.org 2019). Metadata (scientific name, collection date ‘Jan 23’, collector, location and host plants) of these two specimens matched with each other completely and matched with the original description (Sydow & Sydow 1912) except for collected year. However, since Hara (1912) mentioned that “Dr. Sydow created the scientific name ‘*Lachnum japonicum*’ based on a specimen having collected in

January 1912 by myself.”, the year ‘1902’ in the original description seems to be a typographic error of ‘1912’, so both specimens can be regarded as types.

Materials and methods

An ‘isosytype’ specimen TNS-F-209717 housed in TNS was examined. Since DNA extraction from TNS-F-209717 ended in failure, it was examined only morphologically. Morphological observation procedures followed Hosoya & Otani (1997). Dried apothecia were detached from the substrate and rehydrated in ion-exchanged water for 6 h, and then some were observed in cotton blue dissolved in lactic acid (CB/LA) and others were in tap water. Ascal apex iodine reaction was checked by Melzer’s reagent with or without 3% KOH pretreatment and Lugol’s iodine (IKI, 1% Iodine and 1% Potassium Iodine in tap water).

Results

Lachnum japonicum Syd. & P. Syd. in Sydow & Sydow (1912: 409) Fig. 1

Redescription:—**Dried apothecia** gregarious on the substrate, at first spherical, later flat-disc-shaped, 0.5–1.2 mm in diameter, sessile, up to 0.5 mm high. **Dried disc** concave, white to pale yellow, margin incurving, densely covered with dark brown hairs. **Hairs** cylindrical, straight or slightly curved, up to $375 \times 2.8\text{--}4.0 \mu\text{m}$, multiseptate, pale to dark brown, totally smooth, equipped with no crystals or resinous matters, relatively thick walled; wall up to $1.5 \mu\text{m}$ thick; apex blunt and sometimes swelled or protruding, pale brown to hyaline. **Ectal excipulum** *textura globulosa* lacking intercellular spaces and partially *textura prismatica* composed of cubic cells; cells $2.5\text{--}11 \mu\text{m}$ in diameter; wall dark brown in the lower part and light brown to hyaline near medullary excipulum, up to $2.5 \mu\text{m}$ thick. **Medullary excipulum** of *textura intricata* composed of hyaline hyphae. **Asci** $100\text{--}115 \times 5\text{--}7.5 \mu\text{m}$, cylindrical-clavate, 8-spored, arising from croziers; apex conical or hemispherical; pore not reaction against MLZ with or without 3% KOH pretreatment or IKI. **Ascospores** $12.5\text{--}15 \times 2.8\text{--}3.8 \mu\text{m}$, cylindric-ellipsoid, non-septate, containing no guttules. **Paraphyses** narrowly lanceolate to lanceolate, septate, up to $6 \mu\text{m}$ at the widest point, exceeding the asci up to $15 \mu\text{m}$, encrusted by amorphous, nonrefractive matters conspicuous in the upper half; amorphous matters easily detached in the squash mounts; apex acute and sometimes protruded.

Specimen examined:—JAPAN. Gifu: Nakatsugawa city, Kawaue district, 23 Jan 1912, on dead stems of *Boehmeria nivea* (var. *nipponivea*), K. Hara (TNS-F-209717).

Discussion

Most of the morphological characters matched with the original description except for the presence of granules on the surface of hairs (Table 1). Hairs of TNS-F-209717 were apparently smooth and covered with no granules (Fig. 1F) unlike the account of ‘lenissime asperulis’ in Sydow & Sydow (1912) (Table 1).

Morphological examination revealed that the proper genus to dispose is *Trichopezizella* Dennis ex Raitviir (in Raitviir 1969: 68), because of its smooth, brown hairs. Comparison with other *Trichopezizella* spp. descriptions (Raitviir 1970, Haines 1974) elucidated *L. japonicum* was very similar to *Trichopezizella relicina* (Fries 1822: 103) Raitviir (1970: 60) especially in having paraphyses encrusted by amorphous matters (Fig. 1L). Haines (1974) observed number of specimens of *T. relicina* including the type and some of them were conserved in New York Botanical Garden (NYS). In this study, we borrowed seven specimens of *T. relicina* (NYS-D-23, 374, 471, 3365, 4082, 4105, 4258) collected and cited by Haines (1974) to compare the morphology with *L. japonicum* and following differences were noticed: *L. japonicum* was sessile while *T. relicina* was stipitate, *L. japonicum* has ectal excipulum of *textura globulosa* to *prismatica* not arranged in a row while *T. relicina* only of *textura prismatica* composed of cubic cells arranged in a row and *L. japonicum* has larger asci than *T. relicina* (Table 1). Based on these characteristics, *L. japonicum* was proved to be different from *T. relicina* (and other known species of *Trichopezizella*).

In the present study, we therefore propose a new combination as follow. We here designate TNS-F-209717 as the lectotype of the present fungus.

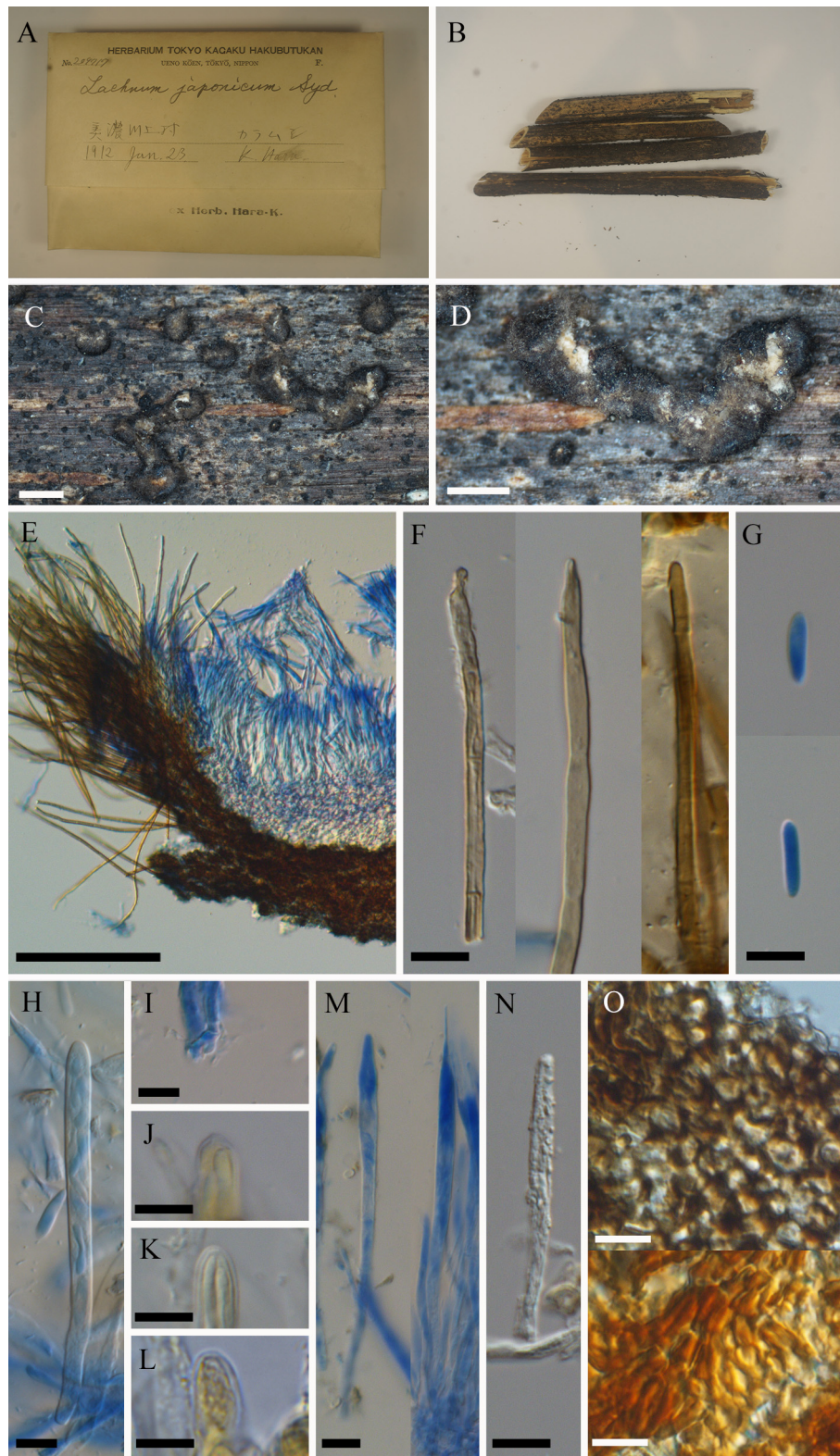


FIGURE 1. *Lachnum japonicum* (TNS-F-209717). **A:** Appearance of the specimen. **B:** Substrates with numerous apothecia. **C, D:** Apothecia. **E:** Vertical section through the apothecia, showing hairs, ectal excipulum, medulla and hymenium. **F:** Hairs. **G:** Ascospores. **H:** Ascus. **I:** An ascus base with a crozier. **J:** An ascus pore MLZ (-) without 3% KOH pretreatment. **K:** An ascus pore MLZ (-) with 3% KOH pretreatment. **L:** An ascus pore IKI (-). **M:** Paraphyses from which amorphous matters were detached by squash mounts. **N:** Paraphysis with amorphous matters. **O:** Ectal excipulum. Scale bars = 1 mm (C, D), 10 μ m (F–O). Mounted in CB/LA (E–I, M, O), MLZ (J, K), IKI (L), tap water (N).

TABLE 1. Comparison of morphological characters of *Lachnum japonicum* (description in this study and original description) and *Trichopezizella relicina*.

	TNS-F-209717 (this study)	Original description of <i>Lachnum japonicum</i> (Sydow & Sydow 1912)	<i>Trichopezizella relicina</i> (Haines 1974)
Apothecia diameter (mm)	0.5–1.2	1–2	up to 0.7
Hair color	pale brown to brown	dull yellow to yellow-brown	umber
Hair surface	smooth	'lenissime asperulis' (=granulate?)	smooth
Hair size (µm)	up to 375 × 2.8–4.0	225–300 × 4–5	up to 400 × 5–9
Asci size (µm)	100–115 × 5–7.5	75–100 × 5.5–8	(45–) 50–65 (–80) × 5–7
Presence or absence of croziers	present	(unmentioned)	generally present
Ascospore size (µm)	12.5–15 × 2.8–3.8	13–17 × 3–3.5	(8–) 8.5–15 (16) × (1.7–) 2–2.5 (–3)
Paraphyses shape	narrowly lanceolate to lanceolate	lanceolate	narrowly lanceolate
Presence or absence of paraphyses' amorphous matters	present	(unmentioned)	present
Cell size of ectal excipulum (µm)	2.5–11	(unmentioned)	6–11

Taxonomy

Trichopezizella japonica (Syd. & P. Syd.) Tojihara & Hosoya, *comb. nov.*

≡*Lachnum japonicum* Syd. & P. Syd. (1912: 409)

MycoBank no.:—MB832700

Lectotype (designated here):—JAPAN. Gifu: Nakatsugawa city, Kawaue district, 23 Jan 1912, on dead stems of *Boehmeria nivea* (var. *nipponnivea*), K. Hara (TNS-F-209717).

Isolotype:—the same specimen information as lectotype (S-Fungi F6259).

Distribution:—Known only from the type locality.

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