Two new species of *Exobasidium* (Exobasidiales) from China

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Abstract—Two new species, *Exobasidium ovalifoliae* on *Lyonia ovalifolia* var. *elliptica* and *Exobasidium tengchongense* on *Pieris formosa*, are reported. They were collected from Yunnan Province. *Exobasidium ovalifoliae* causes leaf hypertrophy and deformation. It is characterized by 2(−3) sterigmata per basidium and by basidiospores that germinate via germ tubes. *E. tengchongense* causes red leaf spots, and has small basidiospores.

Key words—Ustilaginomycetes, symptoms, taxonomy

Two new species of *Exobasidium* were collected from Yunnan Province in 2005. One was found on *Lyonia ovalifolia* var. *elliptica* and the other on *Pieris formosa*. Both host plants belong to the subfamily *Andromedoideae* of *Ericaceae*. To date, 26 species of *Exobasidium* have been recorded in China (Sawada 1922, Teng 1963, Tai 1979, Guo et al. 1991, Zang 1996, Li and Guo 2006a, b, 2008) including the two new species described in this paper.

The first new species is parasitic on young leaves of *Lyonia ovalifolia* var. *elliptica*, causing leaf hypertrophy and deformation. The infected parts of the leaves are concave on the upper surface and convex on the lower surface, subglobose in shape. The diseased parts are at least 7 mm in diam. and sometimes nearly the whole leaf is infected. Usually there are 1–4 deformed parts on each leaf. Transverse sections of a diseased leaf showed no differentiation between the palisade and mesophyll cells. There is hypertrophy and hyperplasia of plant cells. Hyphae protrude between epidermal cells, forming a continuous white hymenium on both surfaces of the leaves at maturity. There are predominantly

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2 (rarely 3) sterigmata per basidium. The sterigmata measure 4–8 × 1.3–3 μm and basidiospores 12–20(–23) × 3–4.2 μm. Through scanning electron microscopy basidiospores with long germ tubes were observed. The new species appears to be the same fungus named *Exobasidium pieridis-taiwanense* by Sawada (1959), who failed to provide a Latin diagnosis, thus making his name invalid according to the International Code of Botanical Nomenclature. Sawada described *Exobasidium pieridis-taiwanense* as occurring on *Pieris taiwanensis* Hayata, where it caused swelling of leaves and produced basidia with 2(–3) sterigmata measuring 5–10 × 2.5–3 μm and basidiospores measuring 15–19 × 4.5–6 μm. We were unsuccessful in obtaining the type specimen on loan from TAI (Herbarium of National Taiwan University) and TNS (Mycological Herbarium, National Science Museum, Tokyo, Japan). Among all the validly described taxa on *Ericaceae* plants, *E. pieridis* Henn. (Ezuka 1991) is considered the most closely related species to the present fungus. It attacks the same host and produces similar symptoms. The sterigmata and basidiospores are of similar sizes, but *E. pieridis* has 2–3(–4) sterigmata and produces basidiospores that germinate by producing conidia. We propose the following name for this new species:
**Exobasidium ovalifoliae** Z.Y. Li & L. Guo, sp. nov.  
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≡*Exobasidium pieridis-taiwanense* Sawada, Descriptive Catalogue of Taiwan (Formosan) Fungi XI p. 98, 1959 (nom. inval.).

_Hymenium amphigenum_. Basidia hyalina, clavata vel cylindrica, 40–70 × 5–8 μm, terminaliter 2(–3) sterigmatibus 4–8 × 1.3–3 μm praedita. Basidiosporae allantoideae vel obvoideae, curvae, 12–20(–23) × 3–4.2 μm, hyalinae, laeves, primo continuae, dein 1–3(–5)-septatae, per hyphas germinantes.

Hymenium amphigenous. Basidia hyaline, clavate or cylindrical, 40–70 × 5–8 μm, with 2(–3) sterigmata. Sterigmata conical, 4–8 × 1.3–3 μm. Basidiospores allantoid or obovoid, 12–20(–23) × 3–4.2 μm, hyaline, smooth, at first continuous, then 1–3(–5)-septate, and slightly curved, germinating by germ tubes.

**Specimen examined**—On *Lyonia ovalifolia* var. _elliptica_ (Siebold & Zucc.) Hand.-Mazz. (*Ericaceae*), Yunnan: Longling, Raolang, alt. 2197 m, 22 IX 2005, Z.Y. Li, L. Guo & N. Liu 229, HMAS 99934 (holotype).

A second new species parasitizes young leaves of _Pieris formosa_, causing leaf spots that are red on the upper surface. The diseased parts are up to 5 mm in diam, with usually one or more diseased parts on each leaf. Transverse sections of the diseased leaf show that there is hypertrophy but no hyperplasia of plant
cells. Hyphae protrude between epidermal cells, forming a continuous thick layer on the under surfaces of the leaves at maturity. There are 2–4 sterigmata per basidium. The sterigmata measure 2–4 × 1–2 μm and basidiospores (6.5–) 10–15 × 2.5–4 μm. *Exobasidium asebiae* Hara & Ezuka (Ezuka 1991) on *Pieris japonica* D. Don ex G. Don is similar to this species, but it has large basidiospores measuring 16–23 × 3–5.5 μm.

*Exobasidium tengchongense* Z.Y. Li & L. Guo, sp. nov. Figs. 2, 7-10

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*Hymenium hypophyllum*. Basidia hyalina, cylindrica, 3–5 μm lata, terminaliter 2–4 sterigmatibus 2–4 × 1–2 μm praedita. Basidiosporae cylindricae vel clavatae, (6.5–)10–15 × 2.5–4 μm, hyalinae, laeves, primo continuae, dein 1–3-septatae.

Hymenium hypophyllous. Basidia hyaline, cylindrical, 3–5 μm wide, with 2–4 sterigmata. Sterigmata conical, 2–4 × 1–2 μm. Basidiospores cylindrical or clavate, (6.5–)10–15 × 2.5–4 μm, hyaline, smooth, at first continuous, then 1–3-septate.

*Specimen examined—On* *Pieris formosa* D. Don (*Ericaceae*), Yunnan: Tengchong, Xiaodifang, alt. 2180 m, 19 IX 2005, Z.Y. Li, L. Guo & N. Liu 201, HMAS 173149 (holotype).

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Figs. 3-6. *Exobasidium ovalifoliae* on *Lyonia ovalifolia* var. elliptica (HMAS 99934, holotype). Fig. 3. Symptoms. Fig. 4. Basidiospores and germ tubes as seen by SEM. Fig. 5. Basidium, sterigmata and basidiospore as seen by LM. Fig. 6. Basidium, sterigmata and basidiospores as seen by SEM. Figs. 7-10. *Exobasidium tengchongense* on *Pieris formosa* (HMAS 173149, holotype). Fig. 7. Symptoms. Figs. 8-9. Basidia, sterigmata and basidiospores as seen by LM. Fig. 10. Basidium and sterigmata as seen by SEM.
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