

## Two new species and a new Chinese record of *Exobasidium* (*Exobasidiales*) from China

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**Abstract**—Two new species, *Exobasidium rhododendri-nivalis* on *Rhododendron nivale* and *E. pyroloides* on *Gaultheria pyroloides*, are reported. They were collected from Yunnan and Sichuan Provinces. *Exobasidium rhododendri-nivalis* causes small galls on leaves, stems and shoots, while *E. pyroloides* causes red leaf spots. *Exobasidium cylindrosporum* on *Rhododendron* sp., collected from Jiangxi Province, is reported as new to China.

**Key words**—*Ustilaginomycetes*, symptoms, taxonomy

Two new species of *Exobasidium*, collected from southwestern China, are described and illustrated. The first new species was collected in 2007 from Yunnan and Sichuan Provinces at altitudes of 4300 m and 4650 m. It is parasitic on *Rhododendron nivale* (subfamily *Rhododendroideae* of *Ericaceae*), causing small galls measuring 1–4 mm in diam. on leaves, stems and shoots. On leaves there are 1–5 (or more) galls on the lower surface. Diseased leaves are convex on the upper surface. The galls are red when fresh and become pale yellowish brown to black when old. Basidiospores with short germ tubes were observed in some microscopical slides of fresh material. The new species is described as:

***Exobasidium rhododendri-nivalis*** ZhenYing Li & L. Guo, sp. nov.      Figs. 1, 4–7  
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*Hymenium album. Basidia clavata vel cylindrica, 7–18 × 4–8 μm, hyalina, terminaliter 2–4 sterigmatibus 4.5–7 × 1–1.5 μm praedita. Basidiosporae ellipsoideae, curvae, 10.2–13 × 2.5–3 μm, hyalinae, laeves, primo continuae, dein 1-septatae; per hyphas germinantes.*

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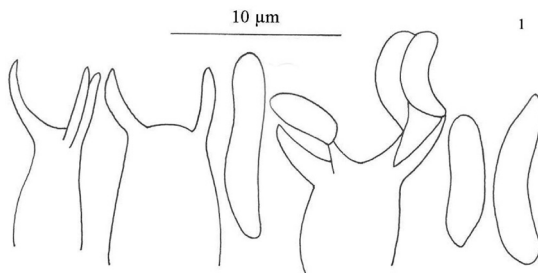


Fig. 1. Line drawings of basidia, sterigmata and basidiospores of *Exobasidium rhododendri-nivalis* on *Rhododendron nivale* (HMAS 183431, holotype).

Hymenium white, forming a continuous layer over the surface of a gall. Basidia clavate or cylindrical,  $7\text{--}18 \times 4\text{--}8 \mu\text{m}$ , hyaline, with 2–4 sterigmata. Sterigmata conical,  $4.5\text{--}7 \times 1\text{--}1.5 \mu\text{m}$ . Basidiospores ellipsoidal,  $10.2\text{--}13 \times 2.5\text{--}3 \mu\text{m}$ , hyaline, smooth, at first continuous, then 1-septate, and slightly curved; germinating by germ tubes.

SPECIMENS EXAMINED—On *Rhododendron nivale* Hook.f. (*Ericaceae*), Yunnan: Deqen, Baimaxue Mountain, alt. 4300 m, 21 IX 2007, Z.Y. Li, L. Guo & S.H. He 697, HMAS 183431 (holotype); Sichuan: Xiangcheng, alt. 4650 m, 24 IX 2007, Z.Y. Li, L. Guo & S.H. He 716, HMAS 183444 (paratype)

*Exobasidium rhododendri-nivalis* is similar to *E. sakishimaense* Otani (1976) although the latter has larger basidiospores ( $15\text{--}24 \times 5\text{--}6 \mu\text{m}$  vs.  $10.2\text{--}13 \times 2.5\text{--}3 \mu\text{m}$ ).

The second new species parasitizes young leaves of *Gaultheria pyroloides* (subfamily *Gaultherioideae* of *Ericaceae*), causing leaf spots that are red on the upper surface. The host plant belongs to the subfamily *Gaultherioideae* of *Ericaceae*. There are one or two diseased parts on each leaf. Transverse sections of the diseased leaf show hypertrophy of plant cells. Hyphae protrude between epidermal cells, forming a continuous thick layer on the lower surfaces of the leaves at maturity. There are 2–4 sterigmata per basidium.

*Exobasidium pyroloides* ZhenYing Li & L. Guo, sp. nov.

Figs. 2, 8–10

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*Hymenium album*, hypophyllum. Basidia cylindrica,  $3.5\text{--}6 \mu\text{m}$  lata, hyalina, terminaliter 2–4 sterigmatibus  $(2\text{--})3\text{--}5\text{--}(6) \times 1\text{--}1.5\text{--}(2) \mu\text{m}$  praedita. Basidiosporae cylindricae vel obovoideae,  $(7\text{--})9\text{--}13 \times 3\text{--}4\text{--}(5) \mu\text{m}$ , hyalinae, laeves, primo continuae, dein 1(–2)-septatae.

Hymenium white, hypophyllous. Basidia cylindrical,  $3.5\text{--}6 \mu\text{m}$  wide, hyaline, with 2–4 sterigmata. Sterigmata conical,  $(2\text{--})3\text{--}5\text{--}(6) \times 1\text{--}1.5\text{--}(2) \mu\text{m}$ . Basidiospores cylindrical or obovoid,  $(7\text{--})9\text{--}13 \times 3\text{--}4\text{--}(5) \mu\text{m}$ , hyaline, smooth, at first continuous, then 1(–2)-septate.



Fig. 2. Line drawings of basidia, sterigmata and basidiospores of *Exobasidium pyroloides* on *Gaultheria pyroloides* (HMAS 183432, holotype).

SPECIMEN EXAMINED—On *Gaultheria pyroloides* Hook.f. & Thomson ex Miq. (*Ericaceae*), Yunnan: Tengchong, Xiaodifang, alt. 2180 m, 19 IX 2005, Z.Y. Li, L. Guo & N. Liu 201, HMAS 183432 (holotype).

*Exobasidium pyroloides* is similar to *E. gaultheriae* Sawada on *Gaultheria cuneata* Bean from which it mainly differs in having 2–4 sterigmata and forming leaf spots; *E. gaultheriae* has 3–6 sterigmata and forms galls.

A third species of *Exobasidium* is a new Chinese record. This species is parasitic on young leaves of *Rhododendron* sp., causing convex or concave galls on the upper surface. The diseased parts are ellipsoidal, usually 9–13 × 4–6.5 mm in size. There are one or more diseased parts on each leaf. Transverse sections of the diseased leaf show that there is hypertrophy of plant cells. Hyphae protrude between epidermal cells, forming a continuous layer on the lower surfaces of the leaves at maturity. It is identified as *Exobasidium cylindrosporum* (Ezuka 1990), which was described from Japan on *Rhododendron macrosepalum* Maxim..

*Exobasidium cylindrosporum* Ezuka, Trans. Mycol. Soc. Japan 31: 451, 1990.

Figs. 3, 11–13

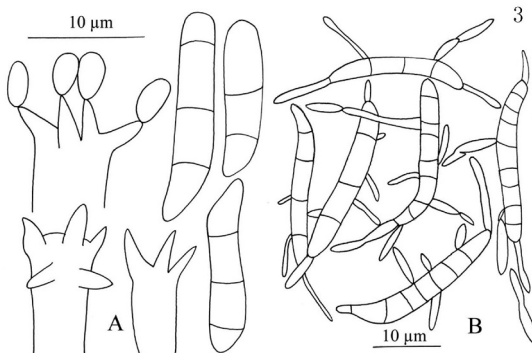


Fig. 3. *Exobasidium cylindrosporum* on *Rhododendron* sp. (HMAS 183415).  
A. Basidia, sterigmata and basidiospores. B. Basidiospore germination.

Basidia cylindrical, 17–30 × 4–6(–8) µm, hyaline, with 3–5(–6) sterigmata. Sterigmata conical, (3.2–)4–5.5(–7) × 1.2–2 µm. Basidiospores cylindrical, 15–20.5 × (3.5–)4(–4.8) µm, hyaline, smooth, at first continuous, with 3–8 septa when germinating, and slightly curved at the base. Short germ tubes emerge from cells at both ends of the basidiospores and from near septa of intermediate cells 24 h after dropping.

SPECIMEN EXAMINED—On *Rhododendron* sp. (*Ericaceae*), Jiangxi: Lushan, alt. 1080 m, 14 V 2007, Z.Y. Li & L. Guo 638, HMAS 183415.

Colonies on PDA grew slowly, to a maximum 10 mm diameter after 21 days incubation at 25°C. The colony was yellow and corrugate on the surface, composed of hyphae and conidia. Conidia linear, 9–20 × 1 µm.

To date, 29 species of *Exobasidium* have been recorded in China (Sawada 1922, Teng 1963, Tai 1979, Guo et al. 1991, Zang 1996, Li & Guo 2006a, b, 2008a, b) including the three species in this paper.

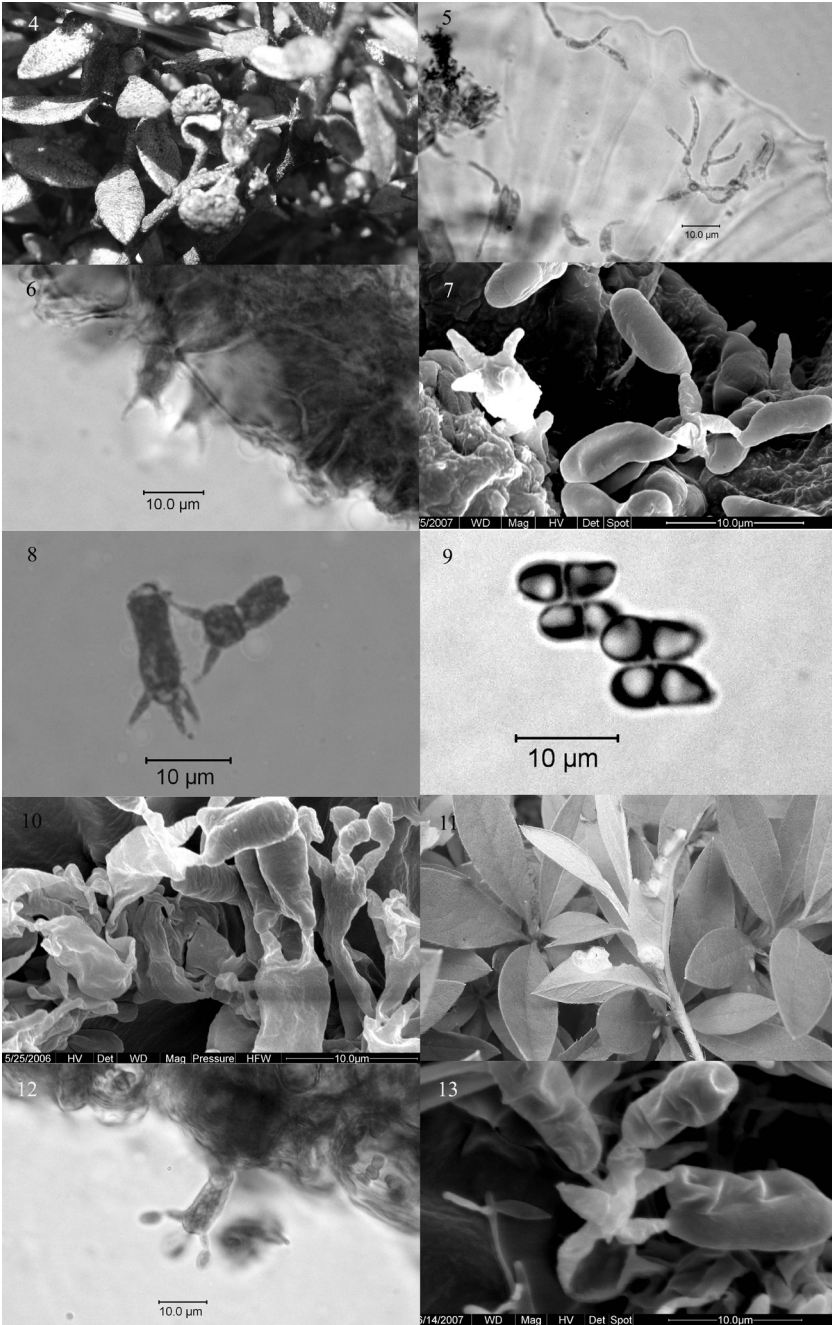
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**Figs. 4–7.** *Exobasidium rhododendri-nivale* on *Rhododendron nivale* (HMAS 183431, holotype). Fig. 4. Symptoms. Fig. 5. Basidiospores and germ tubes as seen by LM. Fig. 6. Basidia and sterigmata as seen by LM. Fig. 7. Basidia, sterigmata and basidiospores as seen by SEM. **Figs. 8–10.** *Exobasidium pyroloides* on *Gaultheria pyroloides* (HMAS 183432, holotype). Fig. 8. Basidia and sterigmata as seen by LM. Figs. 9. Basidiospores as seen by LM. Fig. 10. Basidia, sterigmata and basidiospores as seen by SEM. **Figs. 11–13.** *Exobasidium cylindrosporum* on *Rhododendron* sp. (HMAS 183415). Fig. 11. Symptoms. Fig. 12. Basidium, sterigmata and basidiospores as seen by LM. Fig. 13. Basidium, sterigmata and basidiospores as seen by SEM.



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