



中国蜡盘衣属3新记录种 (英文)

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中国蜡盘衣属 3 新记录种

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摘要: 根据形态、解剖特征和化学特征, 报道了蜡盘衣属(*Biatora*)中国新记录 3 种: 阿拉斯加蜡盘衣(*B. alaskana*)、浅红蜡盘衣(*B. alborufidula*)和长孢蜡盘衣(*B. longispora*), 并编制了中国蜡盘衣属已知种的检索表。

关键词: 树花衣科; 蜡盘衣属; 地衣型真菌; 地衣

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Three *Biatora* Species New to China

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Abstract: Three species of *Biatora*, including *B. alaskana*, *B. alborufidula* and *B. longispora*, are reported from China for the first time. The morphological, anatomical, and chemical characteristics were described. The key to the known species of *Biatora* in China is presented.

Key words: Ramalinaceae; *Biatora*; Lichenized fungi; Lichen

The genus *Biatora* Fr. was described in 1817^[1]. In 1874, Fries Theodor Magnus divided the *Lecidea* into four subgenera of *Psora*, *Biatora*, *Mycoblastus* and *Euclidean* by using Nylander's method, and was later treated as a subgenus of *Lecidea* for nearly a hundred years^[2]. Also, in addition to the characteristics of spores, *Biatora* was divided into 12 groups according to the color of disc, the presence of margin or not, and the pigmentation of hypothecium and paraphyses^[3]. Coppins and Hafellner reintroduced *Biatora* to genus level^[4-5]. The genus is characterized by crustose lichens with green algae, convex apothecia, distinct exciple, asci of *Biatora*-type or *Bacidia*-type, and colorless ascospore simple to 3-septate^[6]. The genus *Biatora* comprises about 40 species, inhabiting organic substrata (bark, wood, bryophytes and plant debris)^[7]. Three species of *Biatora* were reported from

China, *B. vernalis* (L.) Fr., *B. sphaeroides* (Dicks.) Hornem, and *B. carnealbida* (Müll. Arg.) Coppins^[8-9]. During the research on Chinese crustose specimens, three new records of *Biatora* were encountered and reported here.

1 *Biatora alaskana* Printzen & Tønsberg, Bryologist, **102**(4): 696 (1999) Fig. 1

Thallus crustose, more or less with granular verrucae, soredia and isidia absent; prothallus absent; surface gray to grayish white, matt; photobiont trebouxioid. Apothecia rounded or slightly irregular in outline, sessile with strongly constricted base, or some with short stipes, 0.5–0.8 mm diam., mostly single or a few in groups of three; disc pale to orange-brown, strongly convex, epruinose; margin lacking from beginning; exciple distinct, colorless, 50–62 μm wide,

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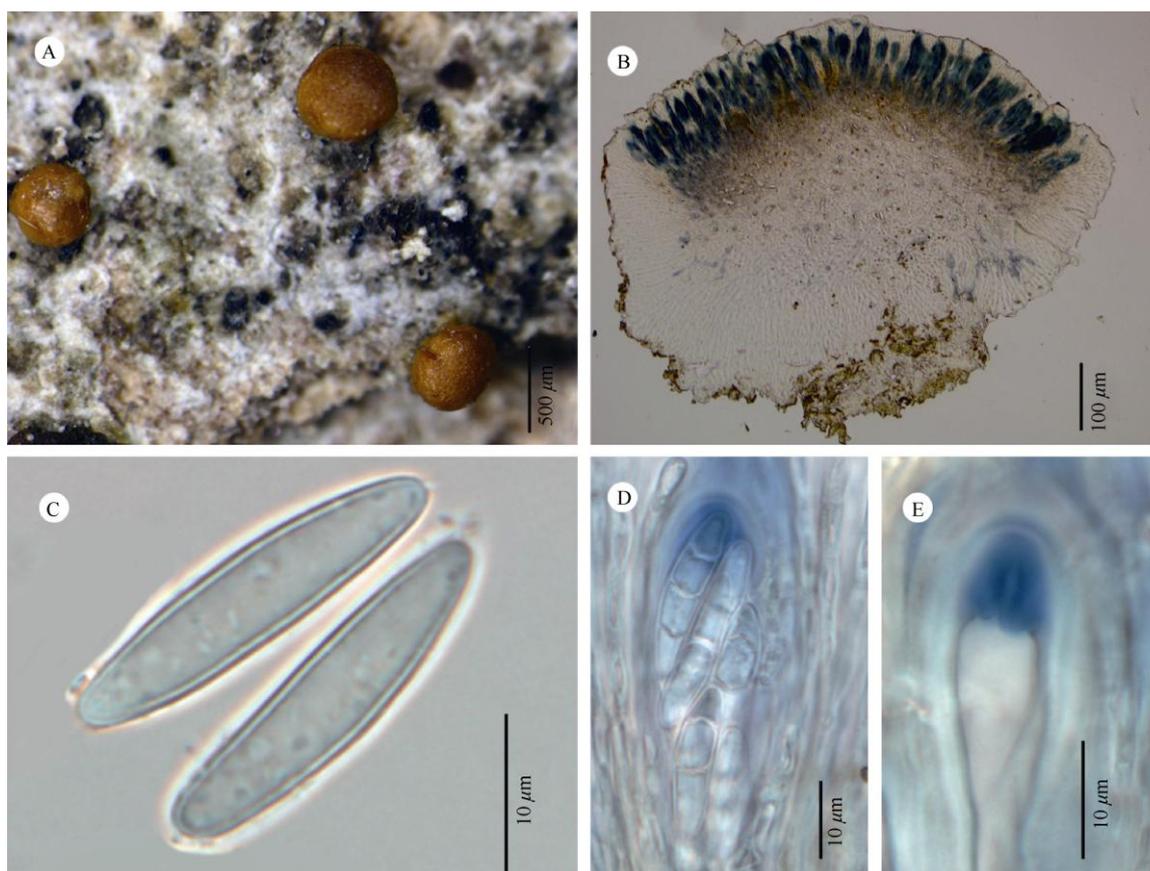


Fig. 1 *Biatora alaskana* (20100024, SDNU). A: Thallus with apothecia; B: Hymenium 0.3% IKI (K/I)+ blue; C: Ascospores simple; D: Ascus with 3-septate ascospores; E: Ascus *Biatora*-type.

hyphae cylindrical; epihymenium lacking; hymenium colorless to pale orange, 50–75 μm high, I+ blue; subhymenium pale brown, 55–80 μm high; hypothecium colorless, 90–200 μm high; paraphyses simple, with 1–2 μm , apically 2.5 μm wide lumina; asci of *Biatora*-type, 8-spored; ascospores colorless, long fusiform, simple or 3-septate, 18–27.5(–30) μm \times 4.8–5.0(–6.2) μm , the ratio of length to width is about 3–6 times. Pycnidia not observed.

Chemistry: Thallus and apothecia 10% KOH (K)–, NaClO (C)–, KOH and NaClO (KC)–, P-Phenylenediamine (Pd)–. No lichen substances detected by Thin Layer Chromatography (TLC).

Distribution: America and Canada^[10]. New to China.

Specimen examined: CHINA. Yunnan, Lijiang City, Mt. Laojunshan, alt. 3 600 m, on bark, 5 Nov. 2009, Zhang Lulu 20100024 (SDNU).

Discussion: *Biatora alaskana* is similar to *B.*

vernalis in morphology and apothecial anatomy, but the later one species has rarely 3-septate ascospores shorter and wider (12.5–19 μm \times 4.5–7.0 μm).

2 *Biatora alborufidula* (Hedl.) S. Ekman & Printzen, in Printzen, *Bibliothca Lichenol*, **60**: 68 (1995) Fig. 2

Thallus crustose, continuous, verrucose or weakly splitting, surface usually white, esorediate, prothallus absent, matt. Apothecia rounded, sessile, 0.2–0.8 mm diam.; single or in groups of two to three, disc pale brown to dark reddish brown, flat to strongly convex, epruinose; margin lacking or some with pale beige, soon excluded; exciple distinct, colorless or pale brown near hymenium, 25–50 μm wide; epihymenium lacking; hymenium colorless or locally pale brown, 30–70 μm high, I+ blue; subhymenium pale brown, 40–60 μm high; hypothecium colorless or pale yellow, 70–120 μm high; paraphyses simple or weakly branched and anastomosing; asci of *Biatora*-type, 8-spored;

ascospores colorless, narrowly ellipsoid, mostly 1-septate, rarely simple, $15\ \mu\text{m} \times (10-12.5-2-2.5-3\ \mu\text{m})$, the ratio of length to width is about 4–6 times. Pycnidia not observed.

Chemistry: Thallus and apothecia K–, C–, KC–, Pd–. No lichen substances detected by TLC.

Distribution: Europe^[11]. New to China.

Specimen examined: CHINA. Jilin, Helong City, Mt. Zengfengshan, alt. 1 600 m, on bark, 19 Aug. 2011, Cheng Yuliang 20119884 (SDNU).

Discussion: This species is characterized by its mostly 1-septate and narrow ascospores. It is similar to *Lecidea albohyalina* (Nyl.) Th. Fr., but the latter one has mostly simple ascospores and endophloeodal thallus^[12].

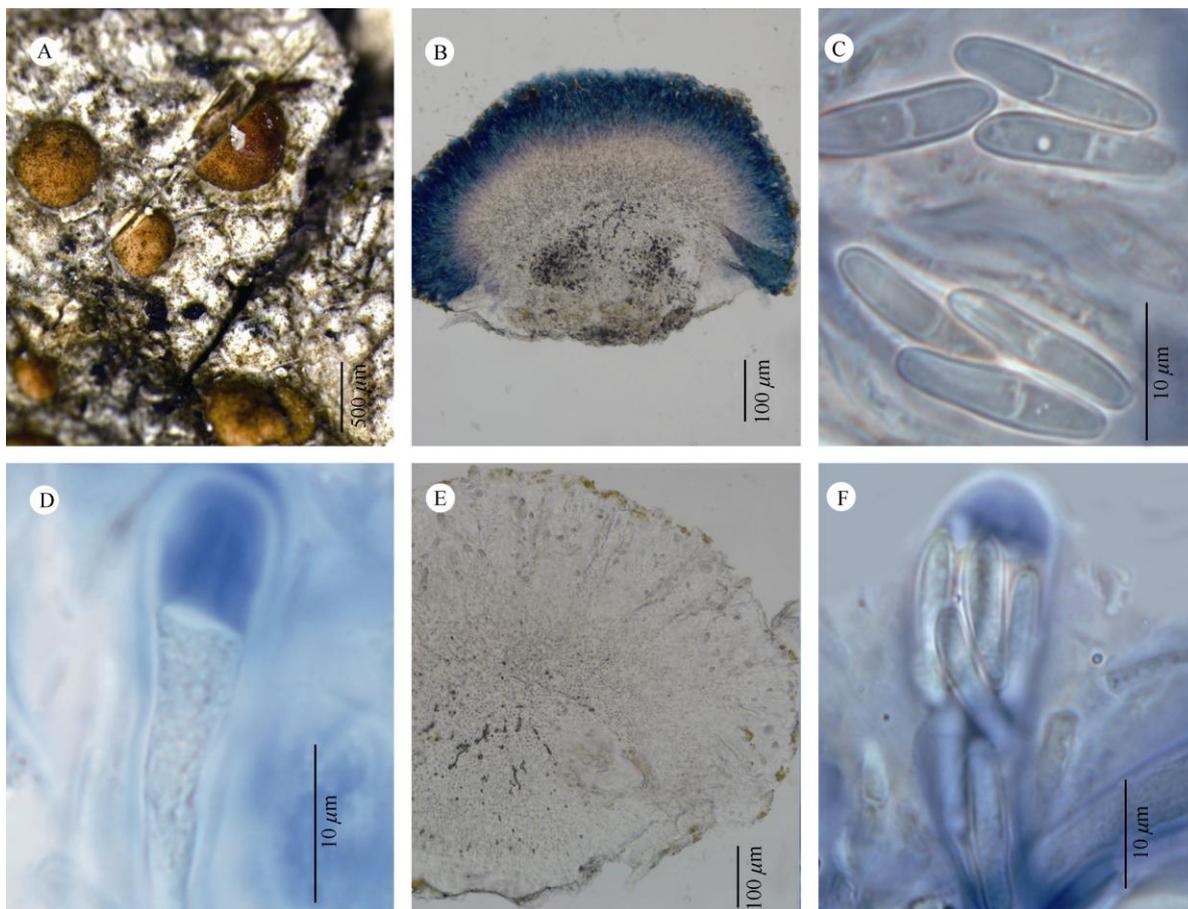


Fig. 2 *Biatora alborufidula* (20119884, SDNU). A: Thallus weakly splitting and apothecia sessile; B: Hymenium K/I+ blue; C: Ascospore 1-septate; D: Ascus *Biatora*-type; E: Section of apothecium; F: Asci with simple ascospores.

3 *Biatora longispora* (Degelius) Lendemer & Printzen, in Lendemer, *Opuscula Philolichenum*, 1: 38 (2004) Fig. 3

Thallus crustose, continuous and smooth, surface grayish white or grayish green, esorediate, prothallus absent. Apothecia approximately rounded, mostly in groups of two to three or single, disc pale yellow brown, flat to strongly convex, margin lacking; exciple distinct, colorless, composed of radiating and weakly branched and anastomosing hyphae; epihymenium

lacking; hymenium colorless or pale brown near subhymenium, 50–80 μm high, I+ blue; subhymenium colorless or pale, 20–30 μm high; hypothecium colorless or pale yellow, 45–60 μm high; paraphyses simple and not separated easily; asci of *Biatora*-type, 8-spored; ascospores colorless, narrowly ellipsoid, simple, $16-22.5\ \mu\text{m} \times 2.5-3.2\ \mu\text{m}$, the ratio of length to width is about 6–7 times. Pycnidia not observe.

Chemistry: Thallus and apothecia K–, C–, KC–, Pd–. No lichen substances detected by TLC.

Distribution: America, Canada, Korea and Turkey^[12]. New to China.

Specimen examined: CHINA. Jilin, Helong City, Mt. Zengfengshan, alt. 1 600 m, on bark, 19 Aug. 2011,

Cheng Yuliang 20119565 (SDNU).

Discussion: *Biatora longispora* is similar to *Biatora subgilva* in apothecial anatomy, but the later one contains usnic and isousnic acids^[13].

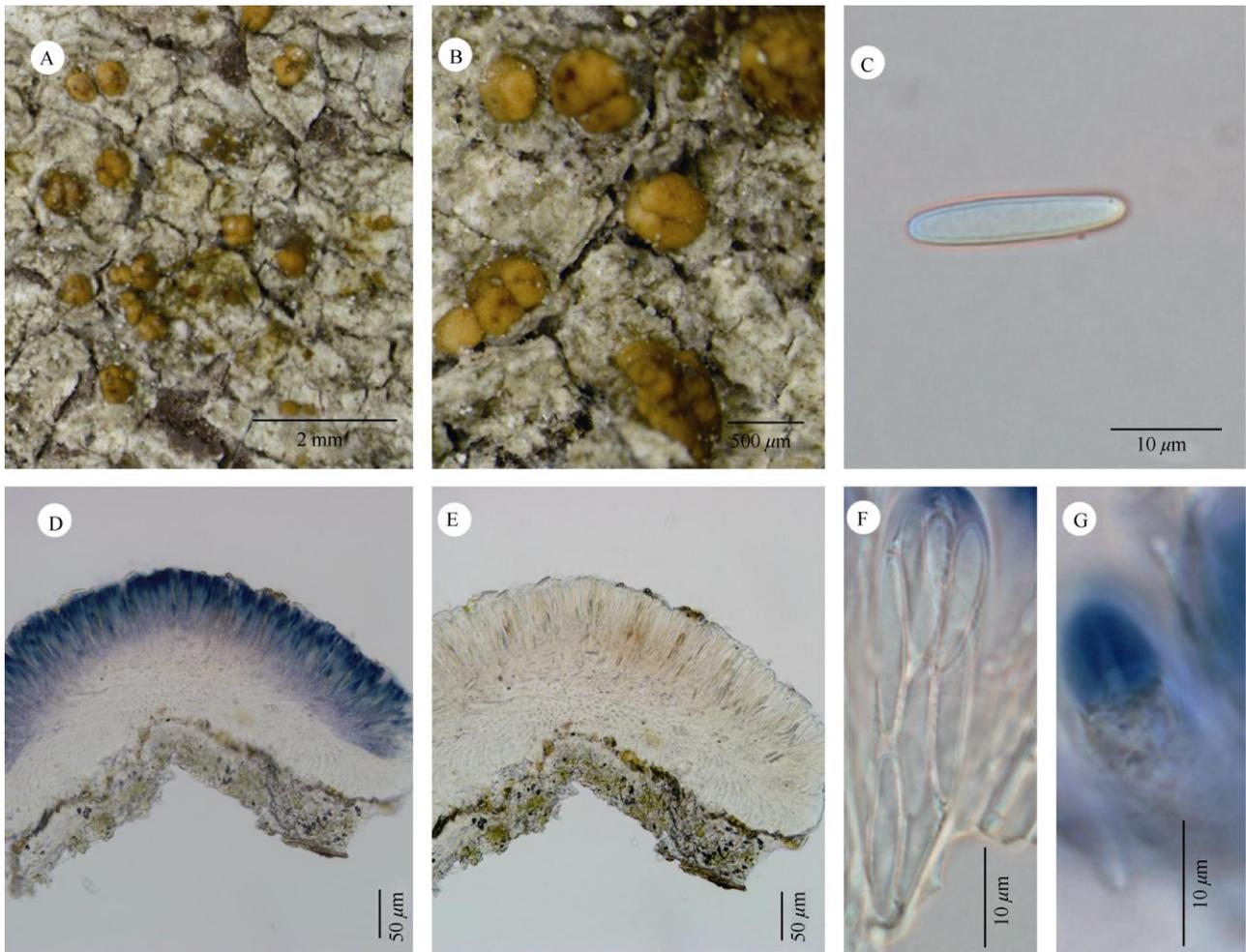


Fig. 3 *Biatora longispora* (20119565, SDNU). A: Thallus and apothecia; B: Apothecia growing in groups; C: Ascospores simple; D: Hymenium K/I+ blue; E: Section of apothecium; F: Asci with ascospores; G: Ascus *Biatora*-type.

Key to the know species of *Biatora* in China

- 1. Thallus gray green to green2
- 1. Thallus gray white to white4
- 2. Apothecia brown, ascospore mostly simple, 12.5–19 μm × 4.5–7.0 μm*B. vernalis*
- 2. Apothecia pale yellow, ascospore 1- or 3-septate3
- 3. Apothecia mostly single, ascospore mostly 1- or 3-septate, 15–20 μm × 5–7.0 μm*B. sphaeroides*
- 3. Apothecia in groups, ascospore mostly 3-septate, 14.5–21.0 μm × 2.0–5.0 μm *B. carnealbida*
- 4. Thallus smooth, disc pale yellow, ascospore always simple, 16–22.5 μm × 2.5–3.2 μm*B. longispora*
- 4. Thallus granular or weakly splitting, disc pale to red brown5
- 5. Ascospore mostly 3-septate, 18–27.5(–30) μm × 4.8–5.0(–6.2) μm*B. alaskana*
- 5. Ascospore mostly 2-septate, (10–)12.5–15 μm × (2–)2.5–3 μm*B. alborufidula*

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