Some interesting species of *Asterina* from Guangdong, China

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Five species of the genus *Asterina* from Guangdong Province (China) are reported in this paper. Among them *Asterina elaeocarpicola*, *A. garciniae*, and *A. nodosa* are new to China, and *Asterina tetracericola* is described and illustrated as a new species.

**Key words**: *Asterina tetracericola*, *Asterinaceae*, new species.

**Introduction**

We are studying the folicolous fungi deposited in the Herbarium of Guangdong Institute of Microbiology (Song et al., 2002, 2003a,b,c) and in this paper report on five *Asterina* species. *Asterina* Lév. was introduced for a group of obligate parasitic fungi on leaves of higher plants, which are widely distributed in tropical and subtropical regions (Doidge, 1942; Hansford, 1946; Müller and von Arx, 1962; Hosagoudar et al., 2001). Hansford (1946) established the *Asterinaceae* based on following characters: parasitic on leaves of plants; mycelium superficial, brown, forming an open network, with or without appressoria; ascomata superficial, thyrothecial, flattened, diminidiate-scutate, orbicular or rounded, opening by a stellate fissure or crumbling of deliquescent cells at the apex. Kirk et al. (2001) acknowledged about 200 taxa, and Hosagoudar and Abraham (2000) list at least 578 species and varieties on various families of hosts. In China, *Asterina* species are mainly distributed to the south of the Yangtze River in subtropical or tropical regions with a warm and humid climate, and at least 35 species and varieties of the genus, including some new species, have been reported mostly from Guangdong and Yunnan Province, China (Ouyang et al., 1995, 1996; Song et al., 2002, 2003b,c). We have critically re-examined specimens and five species occurring in

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Guangdong, including one new species and three new records for China are reported in this paper.

**Taxonomy**

*Asterina elaeocarpicola* Hansf., Reinwardtia 3: 131. 1954. (Figs. 1-3)

*Colonies* mostly hypophyllous, black, thin, arachnoid to nearly velvety, scattered, up to 8 mm diam., sometime confluent. *Hyphae* brown, sinuous, irregularly branching acutely or obtusely, loosely reticulate, cells mostly 15-35 × 3-4.5 µm. *Appressoria* unicellular, in alternate or unilateral arrangement, 1% opposite, spreading, mostly bent, cylindrical, entire, narrowed at apex, 7.2-17 × 3.5-5 µm. *Ascomata* scattered, black, globose to hemispherical, stellately dehisced at the centre, irregularly crenate to short tassels at the periphery, up to 120 µm diam., surface cells 2.5-3.8 µm wide. *Ascospores* brown, oblong, obtuse, 1-septate, constricted at septum, surface smooth, 20-27 × 9-12 µm.


*Notes:* *Asterina elaeocarpicola* Hansf. was first described from Java (Hansford, 1954) as parasitic on *Elaeocarpus punctatum*, and is reported here for the first time from China. It is also known from India (Hosagoudar and Goos, 1996).

So far, five taxa of *Asterina* occurring on members of the genus *Elaeocarpus*, namely *Asterina borneensis* Hansf., *A. elaeocarpi* Syd., *A. elaeocarpi* Syd. var. *ovalis* Kar & Ghosh, *A. elaeocarpi-kobanmochi* Yam. and *A. elaeocarpicola* Hansf. have been recorded from Borneo, China, India, Java, and the Philippines (Sydow, 1911; Hansford, 1954; Yamamoto, 1957; Kar and Ghosh, 1986). The main distinguishing characters of *A. borneensis* are that the ascospores are large (45-50 × 22-24 µm) with verruculose ornamentation. In *A. elaeocarpi* var. *ovalis* and *A. elaeocarpi-kobanmochi* appressoria are alternate or opposite, short and wide (7-11 × 3.9-7 µm for *A. elaeocarpi* var. *ovalis*, 7-10 × 4.5-6 µm for the *A. elaeocarpi-kobanmochi*). *Asterina elaeocarpicola* is also similar to *A. elaeocarpi*, but differs in having shorter and wide nearly lobed appressoria (8-11 × 6-8 µm), allowing easy distinction from *A. elaeocarpicola*.

*Asterina garciniae* Hansf., Proceeding of the Linnean Society, London 158: 44. 1947. (Figs. 4-6)

*Colonies* mostly epiphyllous, thin, black, arachnoid or nearly velvety, up to 6 mm diam., sometime confluent. *Hyphae* brown, nearly straight or sinuous, opposite or irregular branching acutely or obtusely, loosely or closely reticulate, cells mostly 15-35 × 3.5-5 µm. *Appressoria* unicellular, in alternate
or unilateral arrangement, spreading, straight or bent, nearly globose or clavate, entire, 10-11.5 × 5.8-6.5 µm. Ascomata scattered to nearly aggregate, black, orbicular or hemispherical, stellately dehiscent at the centre, irregularly crenate to shortly tasseled at the periphery, up to 150 µm diam., surface cells 2.5-3.5 µm wide. Ascospores brown, oblong, 1-septate, obtuse with rounded ends, constricted at septum, surface smooth, 18.5-22.5 × 7.9-12 µm.

Material examined: CHINA, Heishiding Biosphere Reserve, Fengkai County, Guangdong Province, on leaves of Garcinia oblongifolia Champ. (Guttiferae), 16 October 1992, Y.S. Ouyang and B. Song (HMIGD 34238).

Notes: Asterina garciniae was first described by Hansford (1947) from India, as parasitic on Garcinia mangostanae, and is reported here for the first
time from China. It is also similar to Asterina garciniicola Y.S. Ouyang et al. (1995), but differs from latter species in having larger ascospores (25-30 µm long and 14-18 µm wide) with verruculose ornamentation.

**Asterina nodosa** Doidge, Bothalia 4: 335. 1942. (Figs. 7-9)

Colonies hypophyllous, black, thin to nearly dense, arachnoid to nearly velvety, scattered, up to 15 mm diam., mostly confluent. Hyphae brown, sinuous to rather tortuous or geniculate, irregular branching acutely, loosely or densely reticulate, cells mostly 20-43 × 2.8-4.8 µm. Appressoria unicellular, in alternate or unilateral arrangement, mostly bent or curved, often irregular or obtusely nearly lobate, 7.5-13 × 5-9 µm. Ascomata nearly aggregate to scattered, black, orbicular or hemispherical, stellately dehiscent at the centre,
irregularly crenate to shortly tasseled at periphery, up to 220 µm diam., surface cells 2-3 µm wide. *Ascospores* brown, oblong-ellipsoid, 1-septate, obtuse with rounded ends, constricted or strongly constricted at septum, surface echinulate, 23-33 × 12-17 µm.

*Material examined:* CHINA, Nankun Shan, Guangdong Province, on leaves of *Ilex dasyphylla* Merr. (*Aquifoliaceae*), 12 July 1987, Y.X. Hu (HMIGD 34382); Fengkai County, Guangdong Province, on leaves of *Ilex ficoidea* Hemsl. (*Aquifoliaceae*), 17 October 1992, B. Song and Y.S. Ouyang (HMIGD 34334).

*Notes:* *Asterina nodosa* was described by Doidge (1942) from South Africa, as parasitic on *Ilex mitis*, and is reported here for the first time from China. This species was often associated with *A. bottomleyae* Doidge (1942) and *A. hendersonii* Doidge (1920) on the same leaves. It differs from *A.*

bottomleyae in having alternate or opposite appressoria with larger ascospores (33-39 µm long and 15-20 µm wide). Asterina nodosa differs from A. hendersonii in having smaller appressoria (5-7.5 × 5-6 µm), and smaller ascospores (11-15 µm long and 10-12.5 µm wide) with a smooth surface.

**Asterina tetracericola** B. Song, T.H. Li & F.W. Xing, sp. nov. (Figs. 10-12)

*Coloniae* epiphyllae, subdensae, atrae, arachnoideae vel subvelutinae, ad 3 mm diam. *Hyphae* atro-brunneae, sinuatae, oppositae vel irregulatiter acuteque vel wideque ramosae, laxae vel dense reticulatae, cellulis plerumque 28-35 × 3-4 µm. *Appressoria* unicellula, alternata vel unilatera, laxa, antrorsa, ovata vel subglobosa, angulosa vel lobata, 5.5-10 × 5.5-9 µm. *Ascomata* dispersa vel subaggregata, atra, orbiculata vel hemisphaerica, ad 130 µm diam.,
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stellate dehiscentia ad centrum, irregulariter margina crenata vel fimbriata, cells 3-4 µm lata. Ascosporae atro-brunneae, oblongae, 1-septatae, obtusae, constrictae, echinulatae, 20-23 × 8-10 µm.

*Etymology:* tetracericola, in reference to the host species, *Tetracera asiatica*.

*Colonies* epiphyllous, nearly dense, black, arachnoid to nearly velvety, up to 3 mm diam. *Hyphae* brown, sinuous, opposite or irregular branching acutely or obtusely, loosely to closely reticulate, cells mostly 28-35 × 3-4 µm. *Appressoria* unicellular, in alternate or unilateral arrangement, spreading, ovate to nearly globose, angulose to lobe, 5.5-10 × 5.5-9 µm. *Ascomata* scattered to nearly aggregate, black, orbicular to hemispherical, stellately dehiscent at the centre in maturity, irregularly crenate to shortly tasseled at periphery, up to 130 µm diam., surface cells 3-4 µm wide. *Ascospores* brown, oblong, 1-septate, obtuse, constricted at septum, surface echinulate, 20-23 × 8-10 µm.

*Material examined:* CHINA, Dinghu Shan, Guangdong Province, on leaves of *Tetracera asiatica* (Lour.) Hoogl. (Dilleniaceae), December 1978, G.Z. Jiang (HMIGD 34158, holotype designated here).

*Notes:* The new species is similar to *Asterina tetracerae* Syd. and *Asterina scruposa* var. *longipoda* Hughes. The main distinguishing characters of *A. tetracerae* are that the ascospores have a smooth surface (Sydow, 1931). The main distinguishing characters of *A. scruposa* var. *longipoda* are that the hyphae are larger (7-9 µm), and the appressoria are cylindrical (11-22 × 5-6 µm) (Hughes, 1952).


*Colonies* epiphyllous, black, thin, arachnoid or nearly velvety, orbicular or irregular, up to 3 mm diam., sometime confluent. *Hyphae* brown, nearly straight or sinuous, opposite or alternate branching acutely or obtusely, loosely to closely reticulate, cells mostly 25-45 × 3-5 µm. *Appressoria* bicellular, in alternate or unilateral arrangement, spreading, mostly straight, 7.5-15 µm long; stalk cells cylindrical to cuneate, 2.5-5 µm long; head cells ovate or nearly globe, mostly 1-3-lobed, 5.5-10 × 5-8 µm.

*Ascomata* scattered to nearly aggregate, black, orbicular or hemispherical, stellately dehiscent at the centre, irregularly crenate to shortly tasseled at periphery, up to 120 µm diam., surface cells 1.8-3.3 µm wide. *Ascospores* brown at ends, oblong, 1-septate, obtuse with rounded ends, constricted at septum, surface minor echinulate, 20-23 × 7.5-10 µm.

*Material examined:* CHINA, Wuhua County, Guangdong Province, on leaves of *Casearia villilimba* Merr. (Samydaceae), September 1987, H. Hu (HMIGD 34165).

*Notes:* *Asterina caseariae* Yam. was first described by Yamamoto (1957) from Taiwan (China), as parasitic on *Casearia merrilli*. This is hononym of
Asterina caseariae  Hansford (1944) and Hosagoudar and Abraham (2000) renamed it Asterina yamamotoicola. This species is reported here for the first time from the Chinese mainland. This species is similar to *A. caseariae* Hansford (1944), but differs from latter in having opposite appressoria with smaller ascospores (16-20 × 8-9 µm). This species is also similar to *A. caseariicola* Hosagoudar and Goos (1996), but differs from latter in having 5% opposite appressoria, larger ascospores (18-22 × 11-13 µm) with a smooth surface.
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