

中国地衣新记录属——裂衣属

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摘要: 报道了中国文字衣科地衣一新记录属——裂衣属(*Chapsa* A. Massal.)及其2新记录种, 即印度裂衣(*C. indica* A. Massal.)和斑果裂衣[*C. leprocarpa* (Nyl.) A. Frisch], 标本来自海南和广西。该属主要特征是: 地衣体壳状、树皮生; 具子囊盘类或色盘衣类的子囊果, 固有果壳融合或不明显, 具侧生侧丝; 具横隔或砖壁型胞室的子囊孢子。

关键词: 孢子植物; 地衣型真菌; 分类学; 新记录

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Chapsa (Graphidaceae, Ostropales), A Lichen Genus New to China

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Abstract: Based on the specimens collected from Hainan Island and Guangxi Province, the lichen genus *Chapsa* A. Massal. and two species, *C. indica* A. Massal. and *C. leprocarpa* (Nyl.) A. Frisch, are reported as new to China. The genus is characterized by the corticolous crustose thallus, apothecioid or chroodiscoid ascomata with a fused to indistinctly free proper exciple, the presence of lateral paraphyses, and the transversely septate to muriform ascospores.

Key words: Cryptogamae; Lichenized fungi; Taxonomy; New record

The lichen genus *Chapsa* A. Massal., belonging to the lichenized fungi family Graphidaceae (Ascomycota, Lecanoromycetes, Ostropales), comprises over 70 species, distributed mostly in tropical and subtropical regions^[1-4]. Previously referred to as *Asteristion* Leight. or included in *Thelotrema* Ach. in Thelotremataceae, now, the genus *Chapsa* was revised for species of the thelotremoid Graphidaceae with chroodiscoid apothecia, a periphysoid-bearing proper exciple, distinct and rigid paraphyses with either moniliform or branched tips, transversely septate or submuriform or muriform ascospores^[1-6]. During the study of the lichen family Graphidaceae and the compilation of *Flora Lichenum Sinicorum*, some materials of *Chapsa* were recognized in China. In present paper, the genus and its two species

distributing in Hainan Island and Guangxi Zhuang Autonomous Region are reported as new records to China.

The specimens are deposited in the Lichen Herbarium of College of Life Sciences, Liaocheng University (LCU-L). Stereomicroscope (OLYMPUS SZX12) and light microscopes (OLYMPUS BX51 & NiKON Eclipse-55i) were used for morphological and anatomical studies. Sections of thalli and ascomata were mounted in water, 10% KOH (K) and Lugol's solution (I), respectively. The lichen constituents were identified by thin-layer chromatography^[7-9].

Chapsa A. Massal., in Atti Reale Ist., Veneto Sci. Lett., ed Arti, Sér. 3, 5: 257 (1860). 裂衣属

Type species: *Chapsa indica* A. Massal.

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Thallus corticolous, continuous, endophloeodal or epiphloeodal, usually pale, yellowish, greenish-grey, olive-grey or brown-olive, ecorticate or corticate, smooth, slightly warty, with a matt to glossy, mealy, compact or cartilaginous surface. Photobiont trentepohlioid, often within the substrate, with scattered to continuous photobiont cells. Medulla thin, indistinct or absent, endophloeodal.

Apothecia *Chroodiscus*-type, 0.25–2.5 mm in diam., rounded, angular, reniform and occasionally elongated or slightly branched, apothecioid to chroodiscoid. Margin fissured to lobed, usually strongly raised, rim-like to recurved or reflexed, with a \pm thick, compact or felty, white, pale brown or fawn inner surface. Periderm layer present, often indistinct. Disc pale brown, usually with a thin to thick, fine, coarse or slightly felty, white or bluish-white pruina. Proper exciple fused or (rarely) free from the thalline margin. Columella structures always lacking.

Hymenium non-amyloid, non-inspersed; paraphyses not thickened to rarely \pm thickened, straight to slightly bent, unbranched; apices not to \pm distinctly thickened; lateral paraphyses usually clearly separated from the proper exciple. Asci 1–8-spored, narrowly to broadly clavate, *Thelotrema*-type, I–. Ascospores 1–4-seriate, hyaline or brown, small to large, 12–160 $\mu\text{m} \times 3.5$ –40 μm , transversely septate to muriform, usually hyaline or yellowish, or greyish at late maturity, rarely brown, I– or I+ purplish-blue, with a weak to strong endospore development, halonate or not. Conidiomata often absent.

Chemistry: Lichen compounds absent or presence of stictic acid and related compounds.

Distribution: Tropical to subtropical regions.

The genus *Chapsa* is characterized by thin, usually corticolous thallus, rather large, apothecioid or chroodiscoid ascomata with fused to indistinctly free proper exciple and the presence of lateral paraphyses. It is similar to genera *Acanthotrema*, *Chroodiscus*, *Reimnitzia*, *Thelotrema* and *Topeliopsis*, but differs from them respectively. The genus *Acanthotrema* has paraphyses with spiny tips and thin walled-type ascospores, while *Chroodiscus* is characterized by presence

of thin walled ascospores and absence of lateral paraphyses. *Reimnitzia* is distinguished by thick, *Leptotrema wightii*-like and isidiate thallus with columnar calcium oxalate crystals. *Thelotrema* and *Topeliopsis* differ from *Chapsa* mainly by not having distinctly chroodiscoid ascomata.

1 *Chapsa indica* A. Massal., in Atti Reale Ist., Veneto Sci. Lett., ed Arti, Sér. 3, 5: 257 (1860). 印度裂衣 Fig. 1: A–D

Type: Sri Lanka [‘Ceylon’] – sine loco (VER, not seen).

Thallus corticolous, pale greenish to olive-grey, continuous, matt to slightly glossy. Medullary layer absent. Prothallus line thin and brownish. Phenocortex absent. Photobiont layer 30–90 μm thick, with Inclusions of some calcium oxalate crystals, partly or completely endophloeodal. Medulla endophloeodal.

Apothecia rounded to usually angular, 0.3–2 mm in diam., margin jagged to lobed, incurved to recurved, with a thick white-felty to crystalline inner surface; proper exciple fused. Disc brownish, covered by thick white-felty to crystalline pruina. Proper exciple cupular, 10–15 μm deep at the base, 5–15 μm wide laterally, hyaline. Periphysoids up to 40 μm long, dense, free, perpendicular or inclined towards the epihymenium, 1.5–2 μm wide. Hymenium 100–170 μm high, non-inspersed; paraphyses simple, straight, 1.5–2 μm wide, tips strongly moniliform and intensely adspersed with fine greyish to brownish granules; epihymenium unpigmented, 10–30 μm high. Asci narrowly clavate, 80–150 $\mu\text{m} \times 12$ –25 μm , 8-spored. Ascospores, 2–3 seriate, hyaline, transversely septate, 30–36 loculate, 65–100 $\mu\text{m} \times 5.5$ –8 μm , almost thin-walled or with moderate endospore development, with subacute ends, slightly halonate, I–.

Chemistry: No lichen compounds detected by TLC.

Substrate: On bark.

Specimens examined: China. Hainan: Ledong County, Mount. Jianfengling, 850 m, on barks, 11/XII/2014, Ze-Feng Jia HN2014005 (LCU-L).

Distribution and ecology: Africa (Sierra Leone, Kenya, Mozambique); Asia (India, Sri Lanka, Borneo,

Malaya, Andaman Islands)^[1,10-12]. The Chinese specimen has been collected in tropical virgin forest of Mountain Jianfengling, Hainan Island.

Notes: *Chapsa indica* is characterized by the ecor-ticate, thin or largely endophloeodal thallus, the small angular or shortly elongated apothecia with a usually densely white-felty disc, the paraphyses and periphysoids of the *Chapsa*-type, the large hyaline, transversely

septate ascospores with 65–100 $\mu\text{m} \times 5.5\text{--}8\ \mu\text{m}$ size, and the absence of lichen compounds. The material collected from China differs from other materials by the narrower ascospores, such as the wide size (5.5–)8–11 μm reported by Frish^[1] and 6–12 μm by Mangold^[2]. It is similar to *C. pulchra* in apothecia, ascospores-type and lichen compounds, but that species has smaller ascospores (30–70 $\mu\text{m} \times 5\text{--}8\ \mu\text{m}$ with 12–24-locular)^[1-2].

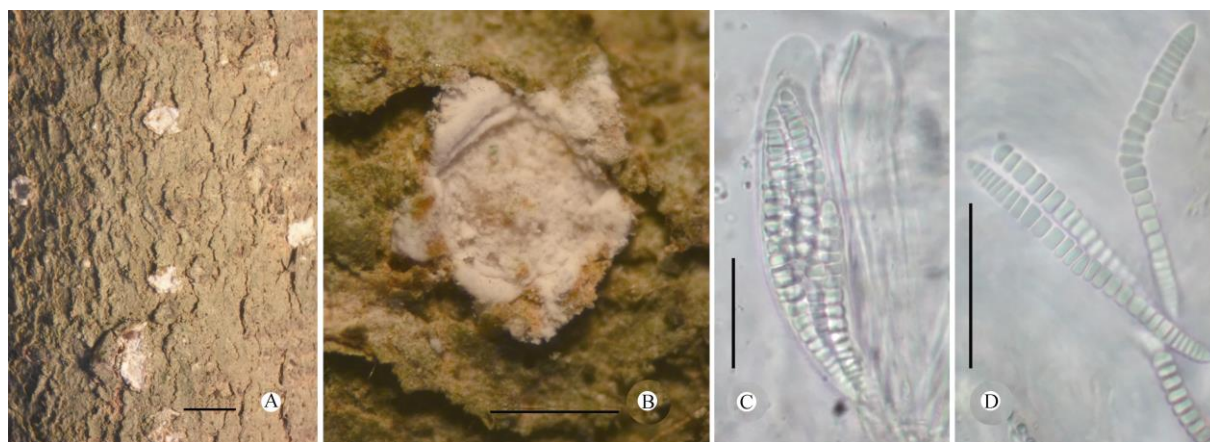


Fig. 1 *Chapsa indica* (Ze-Feng Jia HN2014005). A: Thallus (Bar=1 mm); B: Ascomata (Bar=1 mm); C: Ascus with ascospores (Bar=50 μm); D: Ascospores (Bar=20 μm).

2 *Chapsa leprocarpa* (Nyl.) A. Frisch, Biblioth. Lichenol. 92: 108 (2006). 斑果裂衣 Fig. 2:

A–D

≡ *Graphis leprocarpa* Nyl., Acta Soc. Sci. Fenn. 7: 472 (1863). — *Thelotrema leprocarpum* (Nyl.) Tuck., Genera lichenum: 139 (1872). — *Graphina leprocarpa* (Nyl.) Zahlbr., Cat. Lich. Univ. 2: 412 (1923). Type: USA, Louisiana, on bald Cupress. leg. Hale no. 111, 1853 (holotype, FH-TUCK, isotype, H-NYL 6839).

Thallus corticolous, pale to greenish-grey, continuous, matt, slightly uneven to verrucose, medullary layer absent. Prothallus line thin and brownish. Phenocortex absent. Photobiont layer 30–80 μm thick, with inclusions of some calcium oxalate crystals, largely endophloeodal. Medulla endophloeodal.

Apothecia angular to slightly elongated, 0.3–1.5 mm in diam., margin raised, deeply fissured to lobed, recurved, with a thick white-felty inner surface; proper exciple fused. Disc pale brown, covered by thick

white-felty to crystalline pruina. Proper exciple cupular, 5–15 μm deep at the base, 4–10 μm wide laterally, hyaline. Paraphysoids up to 40 μm long, dense, free, perpendicular or inclined towards the epihymenium, 1.5–2 μm wide. Hymenium 100–150 μm high, non-inspersed; paraphyses simple, straight, 1.5–2 μm wide, tips strongly moniliform and intensely adspersed with fine greyish to brownish granules; epihymenium unpigmented, 8–15 μm high. Asci clavate, 90–130 $\mu\text{m} \times 20\text{--}30\ \mu\text{m}$, 1-spored. Ascospores, hyaline, muriform, 60–110 $\mu\text{m} \times 20\text{--}40\ \mu\text{m}$, almost thin-walled, with acute ends, slightly halonate, I–.

Chemistry: No lichen compounds detected by TLC.

Substrate: On bark.

Specimens examined: China. Guangxi: Shangsi County, Mount. Shiwandashan, 340–420 m, on barks, 25/V/2015, Jian Li GX15095, GX15186, GX15201 (LCU-L).

Distribution and ecology: Africa (Cameroon

and Tanzania); Asia (Sri Lanka and Borneo); America (USA and Brazil)^[1,5,13]. Pantropical, extending to subtropical regions in both hemispheres. The Chinese specimens were collected in lowland rainforest of Mountain Shiwandashan, Guangxi.

Notes: *Chapsa leprocarpa* is characterized by the thin epiphloeodal or endophloeodal, ecorticate, pale to greenish-grey thallus, the chroodiscoid apothecia with a lobed and recurved margin, the heavily white pruinose disc, the single muriform ascospore per ascus,

60–110 $\mu\text{m} \times 20\text{--}40 \mu\text{m}$, the absences of lichen compounds. The materials collected from China differs from other materials by the smaller ascospores. Mangold^[2] reported the ascospores 60–130 $\mu\text{m} \times 20\text{--}40 \mu\text{m}$. It is similar to *C. niveocarpa* and *C. patens*, but the latter two species have larger ascospores, viz. *C. niveocarpa* 80–190 $\mu\text{m} \times 20\text{--}50 \mu\text{m}$ and *C. patens* 90–158 $\mu\text{m} \times 22\text{--}35 \mu\text{m}$. It is also similar to *C. grossomarginata*, but the latter has smaller ascospores (up to 80 μm long)^[1–2].

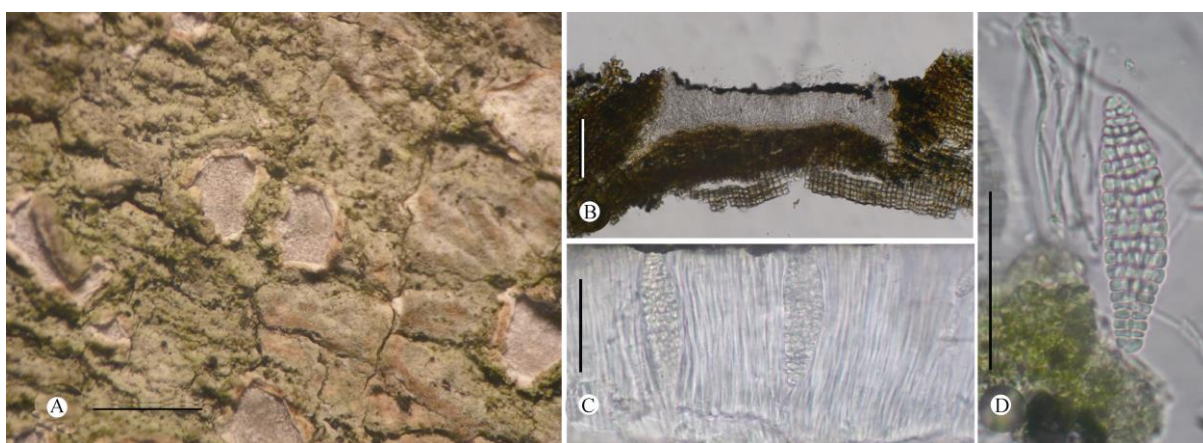


Fig. 2 *Chapsa leprocarpa* (Ze-Feng Jia GX15186). A: Thallus (Bar=1 mm); B: Section of ascomata (Bar=100 μm); C: Hymenium with asci (Bar=50 μm); D: Ascospore (Bar=50 μm).

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