

The genus *Xylaria* in the south of China – 5. Three new records in the China Mainland

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Abstract: Three species of stromatic pyrenomycetous fungi from the genus *Xylaria*, *X. cubensis*, *X. laevis*, and *X. schweinitzii*, are newly recorded in China. *Xylaria cubensis* collected in Yunnan Province, Guizhou Province and Jilin Province is characterized by its clavate stromata with copper brown or brownish-black stromatal surface; *X. laevis* collected from Guangdong Province and Jilin Province is distinguished by its stromatal morphology and texture; *X. schweinitzii* collected from Sichuan Province has smoother stromata and ascospores with obliquely germ slits. The illustrated descriptions of these three species are provided based on the Chinese materials.

Zusammenfassung: Drei Arten stromatischer Pyrenomyceten der Gattung *Xylaria*, *X. cubensis*, *X. laevis* und *X. schweinitzii*, wurden neu in China festgestellt. *Xylaria cubensis* aus den Provinzen Yunnan, Guizhou und Provinz Jilin, ist durch clavate Stromata mit kupferbrauner oder bräunlich-schwarzer Oberfläche gekennzeichnet; *X. laevis* aus den Provinzen Guangdong und Jilin durch spindelförmige Ascosporen; *X. schweinitzii* aus der Provinz Sichuan hat glattere Stromata und Ascosporen mit schrägem Keimschlitz. Beschreibungen dieser drei Arten werden basierend auf den chinesischen Aufsammlungen bereitgestellt.

Xylaria HILL ex SCHRANK, the type genus of the *Xylariaceae* TUL. & C. TUL., has received much attention in recent years (ROGERS 1984, 1986; ROGERS & CALLAN 1986; SAN MARTÍN & ROGERS 1989; VAN DER GUCHT 1995; JU & ROGERS 1999; SAN MARTÍN & al. 2001; JU & HSIEH 2007; ROGERS & al. 2008; FOURNIER & al. 2011). It is characterized by having upright, stipitate, woody to leathery stromata with perithecia entirely immersed. The genus is widely distributed in tropical, subtropical, and temperate regions, and over 300 species have been described (KIRK & al. 2008). However, so far, it has never been monographed, and publications providing detailed descriptions and illustrations of this genus in China are few (DENG 1963; TAI 1979; LI & LI 1994; XU 1999; MA 2011; MA & al. 2011 a, b, 2012). Several surveys of the family *Xylariaceae* have been carried out in the south of China, and several papers dealing with species of *Xylariaceae* have been published based on the specimens

collected during these surveys (MA 2011; MA & al. 2011 a, b, 2012). A further study of these specimens has yielded three additional species of *Xylaria* new to China Mainland.

Materials and methods

Collection, preservation, and identification methods follow JU & ROGERS (1999). Microscopic features and measurements were made from slide preparations mounted in water and Melzer's reagent. The photographs of the asci, ascial apical ring, and ascospores were taken by using a VHX-600E microscope of the Keyence Corporation. The photographs of stromatal surface were taken with a ZSA30w microscope and S70 Canon camera. The studied specimens are deposited at the Herbarium of Mycology of Jilin Agricultural Un. (HMJAU).

New records

Xylaria cubensis (MONT.) FR., Nova Acta Regia Soc. Sci. Upsal. (Ser. 3) 1: 126. 1851; sensu ROGERS (1984) (Fig.1)

Stromata unbranched, cylindrical to clavate, with rounded fertile apices on short or obsolete stipes arising from pannose bases, 2-5 cm in total length \times 0.4-0.9 cm in diam.; externally copper brown to brownish-black, internally white. Texture hard. Surface smooth to slightly rough with ostiolar papillae and fine cracks. Perithecia ovoid, 0.5-0.7 mm; ostioles inconspicuous to conspicuous, prominent. Asci eight-spored, cylindrical, long-stipitate, 120-180 μ m in total length \times 7-8.5 μ m wide, the spore-bearing part (56-)60-71 μ m long, with apical ring bluing in Melzer's reagent, rectangular, 2-2.5 μ m high \times 2-2.3 μ m wide. Ascospores brown to dark brown, unicellular, ellipsoid-inequilateral, with widely rounded ends, smooth, (9-)9.5-10.5(-11) \times 5.5-6.5 μ m, with inconspicuous germ slit.

Material examined: China: Yunnan Province, Mengla County, Xinshuangbanna Tropical Botanical Garden, 21° 41' N, 101° 25' E, on rotten wood, 19. October 1974, M. ZANG (HKAS2350); on rotten wood, 7. August 2010, H.-X. MA (HMJAU22892); 10. August 2010, H.-X. MA (HMJAU23029); Guizhou Province, Leigong Mountain, 26° 15' N, 108° 5' E, on rotten wood, 24. August 2010, H.-X. MA (HMJAU23674); Jilin Province, Changbai Mountain, 40° 15' N, 100° 10' E, on rotten wood, 17. September 2010, Y.-G. FAN (HMJAU 22640, 22641).

Habitat: on decaying wood in broadleaved or conifer-broadleaved forests in tropical, subtropical and temperate areas.

Distribution: *Xylaria cubensis* is very common and has been found in many countries of Africa, North and South America, Asia, and Oceania. The Chinese specimens from Yunnan Province were collected at about 550 m s. m. in a tropical climate, from Guizhou Province at about 1500 m s. m. in a subtropical monsoon mountain climate, from Jilin Province at about 1000 m s. m. in a temperate continental mountain climate.

Comments: *Xylaria cubensis* has been described by many mycologists (LLOYD 1918; DENNIS 1958, 1961; MARTIN 1970; ROGERS 1984; ROGERS & SAMUELS 1987; ROGERS & al. 1988; SAN MARTÍN & ROGERS 1989; CALLAN & ROGERS 1990; VAN DER GUCHT 1995; JU & ROGERS 1999, SAN MARTÍN & al. 2001), but it is reported in the Chinese Mainland for the first time. The Chinese material seems to fit ROGERS' (1984) concept of *X. cubensis*: the typical characteristics are copper brown or brownish-black clavate stromata with rounded apices, the smooth surface with papillate ostioles, and dark ascospores with germ slits unclear.

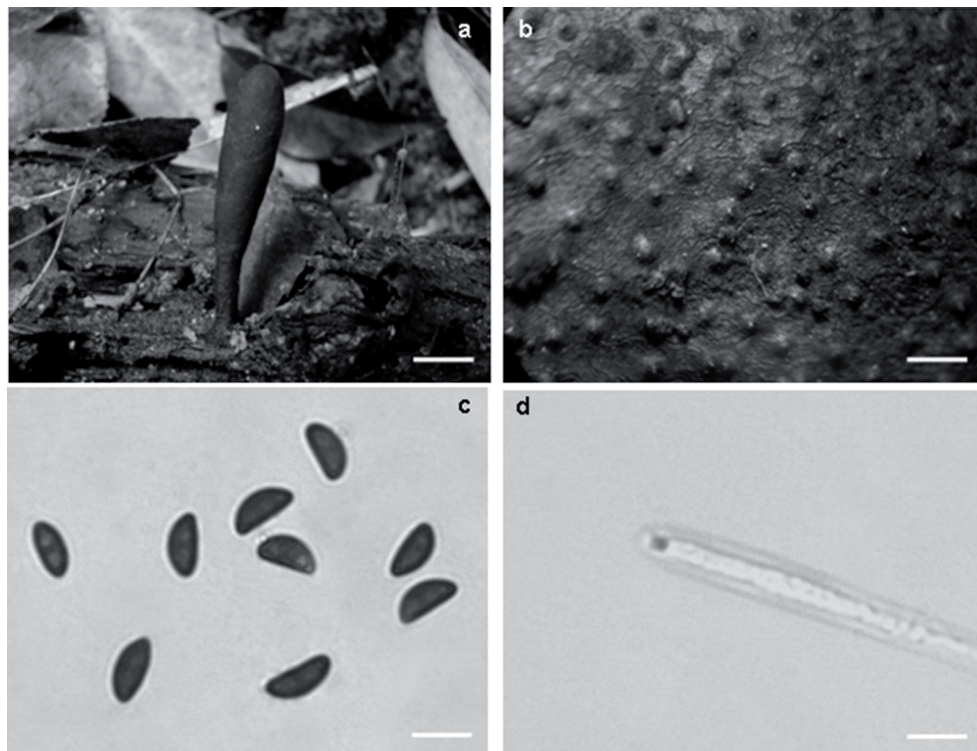


Fig.1. *Xylaria cubensis*, a stromata, b stromatal surface, c ascospores, d germ slit; bars: a 7.5 mm, b 0.5 mm, c 8.3 µm, d 7.5 µm.

Xylaria allantoidea (BERK.) FR. resembles *X. cubensis* in many respects, but these species can be separated from each other on the basis of distinctive teleomorphic features. First, the stromata of the two taxa are different: *X. allantoidea* usually has more robust and more allantoid stromata, whereas stromata of *X. cubensis* are smaller. In addition, the ascospores of *X. allantoidea* are paler and longer (average 14.2 µm in Chinese collections) and have a conspicuous germ slit almost in spore-length, while *X. cubensis* has smaller ascospores, brown to dark brown, with usually inconspicuous germ slit, or when sometimes conspicuous, less than spore length. Furthermore, *X. allantoidea* has a larger apical apparatus (2.2-3.6 µm high × 2-3 µm wide), whereas the apical apparatus of *X. cubensis* is smaller (1.6-2.4 µm high × 1.4-1.8 µm).

***Xylaria laevis* C. G. LLOYD**, Mycol. Writings 5: 8. 1918 (Fig. 2)

Stromata upright, solitary, unbranched, cylindrical to shortly clavate, with rounded fertile apices on very short or obsolete stipes, 0.6-2.2 cm in total length × 2.5-6.0 mm in diam; externally darkish brown to black brown, internally white at first, becoming hollow with age, and finally a thin fragile shell left. Texture fragile. Surface smooth. Perithecia spherical, 0.3-0.6 mm; ostioles prominent. Asci eight-spored, cylindrical, long-stipitate, 130-210 µm in total length × 5.5-6.5 µm wide, the spore-bearing part 53-64 µm long, with apical ring bluing in Melzer's reagent, rectangular, 0.7-1.3 µm

high \times 1.2–1.7 μm wide. Ascospores brown, unicellular, inequilateral-ellipsoid, with narrowly to broadly rounded ends, smooth, 8.5–9.5(–10) \times 5–6 μm , sometimes bearing a minute hyaline appendage at the one end, with inconspicuous germ slit.

Material examined: **China:** Jilin Province, Wangqing County, Jingouling Farm, 43° 20' N, 130° 10' E, on rotten wood, 19. September 2009, H.-X. MA (HMJAU 20635); Guangdong Province, Dinghu Mountain, 23° 10' N, 112° 33' E, on rotten wood, 30. June 2010, H.-X. MA (HMJAU 22256); Heishiding Nature Reserve, 23° 31' N, 111° 52' E, on rotten wood, 1. July 2010, H.-X. MA (HMJAU 22279).

Habitat: on rotten wood in the broadleaved or conifer-broadleaved forests in subtropical and temperate areas.

Distribution: *Xylaria laevis* has been reported in Mexico, USA, Ivory Coast, Indonesia, Philippines, Papua New Guinea, and Taiwan. The specimens studied from Jilin Province were found at about 700 m s. m. in a temperate monsoon climate, from Guangdong Province at about 650 m s. m. in a subtropical monsoon climate.

Comments: This species was found in the Chinese Mainland for the first time. *Xylaria laevis* was believed by LLOYD (1918) to be a small-spored form of *X. nigrescens* because of similar stromatal morphology, and similar to *X. cubensis* in shape, size and ascospores, but it has no sign of a pellicle. *Xylaria laevis* seems to be an intermediate between *X. allantoidea* and *X. cubensis*: it is similar to *X. cubensis* in the size range of the ascospores, but the apical ring of the latter is larger, 2–2.5 μm high \times

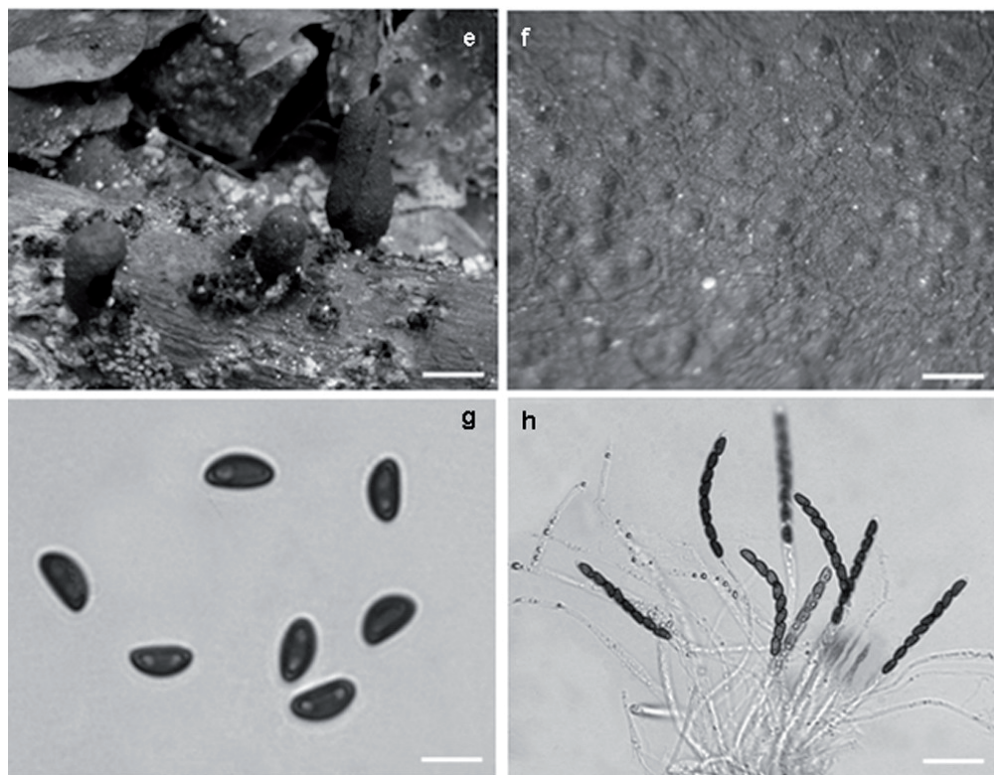


Fig. 2. *Xylaria laevis*, e stromata, f stromatal surface, g ascospores, h Asci; bars: e 6.4 mm, f 0.38 mm, g 7.6 μm , h 24 μm .

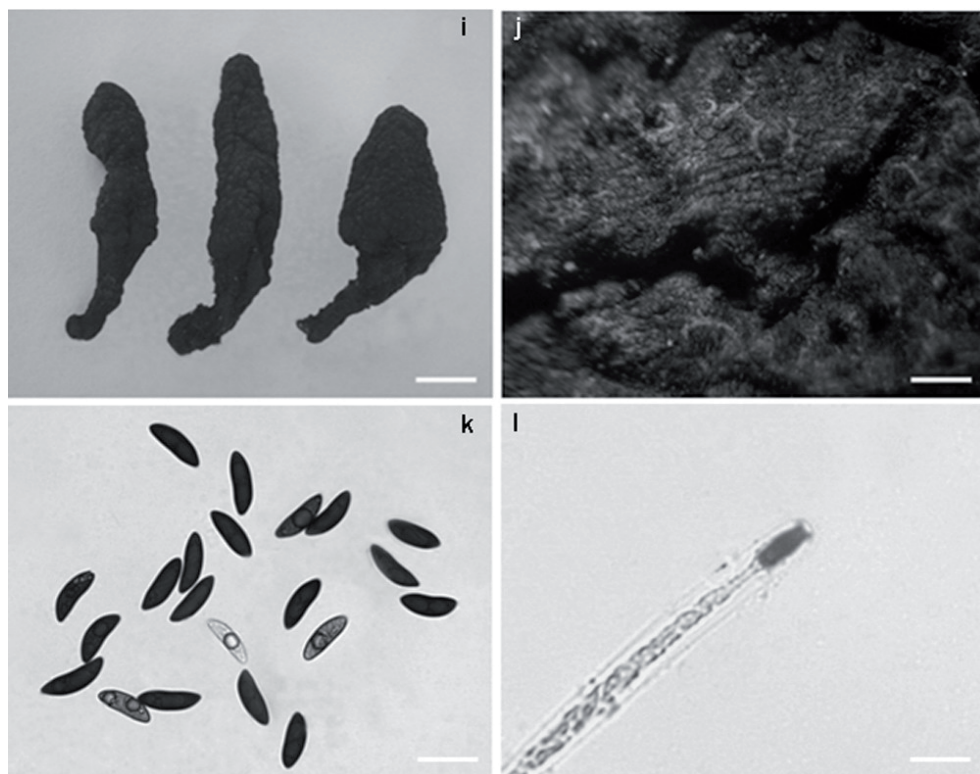


Fig. 3. *Xylaria schweinitzii*, i stromata, j stromatal surface, k ascospores, l germ slit; bars: i 5.0 mm, j 0.36 mm, k 23.75 μ m, l 12 μ m.

2-2.3 μ m wide, whereas *X. laevis* has a smaller apical ring. *Xylaria laevis* could be separated from *X. allantoidea* by smaller ascospores. VAN DER GUCHT (1995) described ascospores of the species from Papua New Guinea as slightly inequilateral-ellipsoid to citriform, with acute ends. JU & ROGERS (1999) described ascospores from Taiwan as short fusoid. The specimens collected in Mainland China seem to have inequilateral-ellipsoid ascospores, but the other characters fit well the descriptions of *X. laevis*. We prefer to use the name *X. laevis* for those Chinese collections until further study is done.

***Xylaria schweinitzii* BERK. & CURT., J. Acad. Nat. Sci. Philadelphia, n. s. 2: 284. 1853. (Fig. 3)**

Stromata upright, usually solitary, unbranched, cylindrical, clavate to irregular, with rounded fertile apices, on short or long stipes, 2-6 cm in total length \times 0.8-1.2 cm in diam.; externally black brown to black, internally white. Texture hard. Surface roughened by small wrinkles and perithecial contours. Perithecia ovoid, 0.5-0.8 \times 0.7-1 mm; ostioles conspicuous, cone-like, prominent. Asci eight-spored, cylindrical, long-stipitate, (180-)200-260(-280) μ m in total length \times 10-11.5 μ m wide, the spore-bearing part 152-167 μ m long, with apical ring bluing in Melzer's reagent, rectangular, 10-12.5 μ m high \times 4-6(-8) μ m wide. Ascospores dark brown, unicellular, ellipsoid-ine-

quilateral, navicular to crescent, with widely to narrowly rounded ends, with oblique germ slit much less than spore-length.

Material examined: **China:** Sichuan Province, Qingcheng Mountain, 31° 01' N, 103° 32' E, on rotten wood, 13. September 2010, H.-X. MA (HMJAU 22751).

Habitat: on rotten wood in the broadleaved forest in subtropical areas.

Distribution: The species has been found in many countries including the North and South Americas, Africa, South Europe, South East Asia and some countries of Oceania (DENNIS 1957, 1961; ROGERS & CALLAN 1986; ROGERS & al. 1988). The studied specimens from Sichuan Province were collected at about 850 m s. m. in a subtropical climate.

Comments: The Chinese collections fit well the description by ROGERS & CALLAN (1986). Many mycologists, such as LLOYD (1919), CARROLL (1964), ROGERS & CALLAN (1986), VAN DER GUCHT (1995), and JU & ROGERS (1999) have considered *X. schweinitzii* to be a tropical variant of *X. polymorpha*, whereas DENNIS (1958, 1961) placed the name *X. schweinitzii* in synonymy under *X. polymorpha*. We accept the concept of *X. schweinitzii* as the tropical variant of *X. polymorpha*, which has smoother stromata and ascospores with oblique germ slits.

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References

- CALLAN, B. E., ROGERS, J. D., 1990: Teleomorph-anamorph connections and correlations in some *Xylaria* species. – Mycotaxon **36**: 343-369.
- CARROLL, G. C. 1964: *Pyrenomyces*, mainly *Xylariaceae*, from some South Pacific Islands. – Bot. Tidsskr. **59**: 301-310.
- DENG, S. C., 1963: Fungi of China. – Peking: Science Press.
- DENNIS, R. W. G., 1957: Further notes on tropical American *Xylariaceae*. – Kew Bulletin **12**: 297-232.
- 1958: Some xylosphaeras of tropical Africa. – Rev. Biol. **1**: 175-208.
- 1961: *Xylarioideae* and *Thamnomycetoideae* of Congo. – Bull. Jard. Bot. État **31**: 109-154.
- FOURNIER, J., FLESSA, F., PERŠOH, D., STADLER, M., 2011: Three new *Xylaria* species from southwestern Europe. – Mycol. Progress **10**: 33-52.
- JU, Y. M., ROGERS, J. D., 1999: The *Xylariaceae* of Taiwan (excluding *Anthostomella*). – Mycotaxon **73**: 343-440.
- HSIEH, H. M., 2007: *Xylaria* species associated with nests of *Odontotermes formosanus* in Taiwan. – Mycologia **99**: 936-957. doi:10.3852/mycologia.99.6.936.
- KIRK, P. F., CANNON, P. F., MINTER, D. W., STALPERS, J. A., (Eds) 2008: Dictionary of the fungi, 10th edn. – Egham: CABI.
- LI, Y. X., LI, H. J. 1994: A novel species of *Xylaria*. – J. Nanjing Agricult. Univ. **17**(3): 145-147.
- LLOYD, C. G., 1918: *Xylaria* notes no. 1. – Mycol. Writings **5**: 1-16.
- 1919: Mycological notes no. 61. – Mycol. Writings **6**: 877-903.
- MA, H.-X., 2011: Taxonomy and molecular phylogeny of several genera of *Xylariaceae* from China. – Jilin Agricultural University, Changchun, PhD dissertation.
- VASILYEVA, L., YU, L., 2011 a: A new species of *Xylaria* from China. – Mycotaxon **116**: 151-155.
- — — 2011 b: *Xylaria choui*, a new species from China. – Sydowia **63**(1): 79-83.
- — — 2012: The genus *Xylaria* in the south of China - 3. *Xylaria atroglobosa* sp. nov. – Mycotaxon **119**: 381-384.

- MARTIN, P., 1970: Studies in the *Xylariaceae* VIII. *Xylaria* and its allies. – J. S. African Bot. **36**:71-83.
- ROGERS, J. D., 1984: *Xylaria cubensis* and its anamorph *Xylocoremium flabelliforme*, *Xylaria allantoidea*, and *Xylaria poitei* in continental United States. – Mycologia **76**: 912-923. doi:10.2307/3793147.
- 1986: Provisional keys to *Xylaria* species in continental United States. – Mycotaxon **26**: 85-97.
- CALLAN, B. E., 1986: *Xylaria polymorpha* and its allies in continental United States. – Mycologia **78**: 391-400. doi:10.2307/3793042.
- — ROSSMAN, A. Y., SAMUELS, G. J., 1988: *Xylaria* (*Sphaeriales*, *Xylariaceae*) from Cerro de la Neblina, Venezuela. – Mycotaxon **31**: 103-153.
- MILLER, A. N., VASILYEVA, L. N., 2008: *Pyrenomyces* of the Great Smoky Mountains National Park. VI. *Kretzschmaria*, *Nemania*, *Rosellinia* and *Xylaria* (*Xylariaceae*). – Fungal Diversity **29**: 107-116.
- SAMUELS, G. J., 1987 [„1986“]: Ascomycetes of New Zealand 8. *Xylaria*. – New Zealand J. Bot. **24**(4): 615-650.
- SAN MARTÍN, S. F., ROGERS, J. D., 1989: A preliminary account of *Xylaria* of Mexico. – Mycotaxon **34**: 283-373.
- LAVÍN, P., ROGERS, J. D., 2001: Some species of *Xylaria* (*Hymenoascomycetes*, *Xylariaceae*) associated with oaks in Mexico. – Mycotaxon **79**: 337-360.
- TAI, F. L. 1979: Sylloge Fungorum Sinicorum. – Peking: Science Press.
- VAN DER GUCHT, K., 1995: Illustrations and descriptions of xylariaceous fungi collected in Papua New Guinea. – Bull. Jard. Bot. Belg. **64**: 219-403.
- XU, A. S., 1999: A new species of *Xylaria*. – Mycosystema **18**: 137-140.

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