

MYCOTAXON

DOI: 10.5248/114.361

Volume 114, pp. 361–366

October–December 2010

A new species of *Phlyctis* (*Phlyctidaceae*) from ChinaRUI MA¹, HONG-MEI LI², HAI-YING WANG^{1*} & ZUN-TIAN ZHAO^{1*}*lichenmr@yahoo.com* * *lichenwhy@yahoo.com.cn* * *ztzhao@sohu.com*¹*College of Life Sciences, Shandong Normal University
Jinan, 250014, P. R. China*²*College of Life Sciences, Hebei University
Baoding, 071002, P. R. China*

Abstract — A new *Phlyctis* species, *P. subargena*, characterized by a sorediate thallus, clustered apothecia and 2-spored asci, is described from north-central China.

Key words — lichen, ascomycetes, Asia, taxonomy

Introduction

After Flotow (1850) established the lichen genus *Phlyctis* (Wallr.) Flot., the genus was expanded to include taxa formerly placed in *Phlyctomia*, *Phlyctella*, and *Phlyctidia* (Galloway & Guzmán 1988). Following phylogenetic analyses of molecular data, *Phlyctis* was moved from the *Lecanorales* to the *Ostropales* (Wedin et al. 2005, Miadlikowska et al. 2006). *Phlyctis* species are morphologically characterized by crustose thalli; small innate or subimmersed apothecia; large, colourless, and septate or muriform ascospores, 1–2 or 8 per ascus; and globose green algae as photobionts (Purvis et al. 1992, Brodo et al. 2001, Tønsberg 2004, Galloway 2007). *Phlyctis* species contain one or several of the following depsidone acids: stictic, constictic, norstictic, connorstictic, hypostictic, salazinic, psoromic, neopsoromic, and protocetraric (Galloway & Guzmán 1988).

Phlyctis contains approximately 12 species worldwide (Kirk et al. 2008), but only *Phlyctis schizospora* Zahlbr., from Hubei Province, has been reported from China (Chen et al. 1989, Wei 1991). During our study of *Phlyctis* collected from Gansu Province, an interesting *Phlyctis* species new to science was found.

* Equal corresponding authors

Materials and methods

The specimens studied were collected from Gansu Province, China, and are preserved in SDNU (Lichen Section of Botanical Herbarium, Shandong Normal University). The morphology of the lichen specimens was examined using a stereo microscope (COIC XTL7045B2) and a compound microscope (JNOEC XS-213). Lichen substances in all specimens cited were identified using the standardized thin layer chromatography techniques (Culberson 1972). Photos of the thallus and ascospores were taken under OLYMPUS SZX12 with DP70.

Taxonomy

Phlyctis subargena R. Ma & H.Y. Wang, sp. nov.

FIG. 1

MYCOBANK 518778

Species acido norstictico, sporis 2nae et soreidiis copiosis a congeneribus diversa.

TYPE COLLECTION: CHINA. Gansu province, Longnan, Wenxian Co. Qiujiaba, alt. 2450m, on bark, F. Yang, 3-8(-10) August 2007. (Holotype in SDNU).

EXPANDED DESCRIPTION —Thallus crustose, 60–120 μm thick, distinctly sorediate; surface arachnoid-byssoid, forming patches, roughened-uneven to irregularly areolate; areolate 0.1–0.2 mm, greenish white; prothallus white at margins and breaks in thallus; soralia usually paler than thallus, powdery to granular, coalescing to form diffuse, irregular patches. Apothecia frequent, 0.1–0.3 mm in diam, 3–8(-10) clustered, immersing in thalline sorediate patches; disc reddish-brown, rounded to irregularly, plane, usually with white pruina; exciple poorly developed. Epithymenium yellow-brown, up to 30 μm thick; hymenium colourless, up to 130 μm thick, hypothecium pale to light brown, up to 30 μm thick; paraphyses slender, simple; asci broadly clavate, 110–150 \times 32–40 μm , 2-spored; ascospores hyaline, muriform, 42–78 \times 30–42 μm ; I-. Photobiont green, globose, 12–18 μm in diam.

CHEMISTRY — Cortex K+ yellow, C-; medulla K+ yellow-orange-red, C-, PD+ yellow. Constituent in 6 specimens tested: norstictic acid.

SUBSTRATE AND DISTRIBUTION —*Phlyctis subargena* is a corticolous species, found only in the type locality at present.

ADDITIONAL SPECIMENS EXAMINED —CHINA. Gansu: Longnan, Wenxian Co., Qiujiaba, alt. 2450m, on bark, 2/VIII/2007, F. Yang 20070024, 20070043, 20070045; alt. 2350m, on bark, 3/VIII/2007, F. Yang 20070080; alt. 2350m, on bark, 5/VIII/2007, F. Yang 20070381, 20070383-1(SDNU).

COMMENTS —The presence of norstictic acid, abundant soredia, and two spores per ascus distinguishes *Phlyctis subargena* from all other *Phlyctis* species. *Phlyctis agelaea* (Ach.) Flot., *P. chilensis* D.J. Galloway & Guzmán, *P. oleosa* Stirt., *P. speirea* G. Merr., *P. uncinata* Stirt. and *P. argena* (Ach.) Flot.

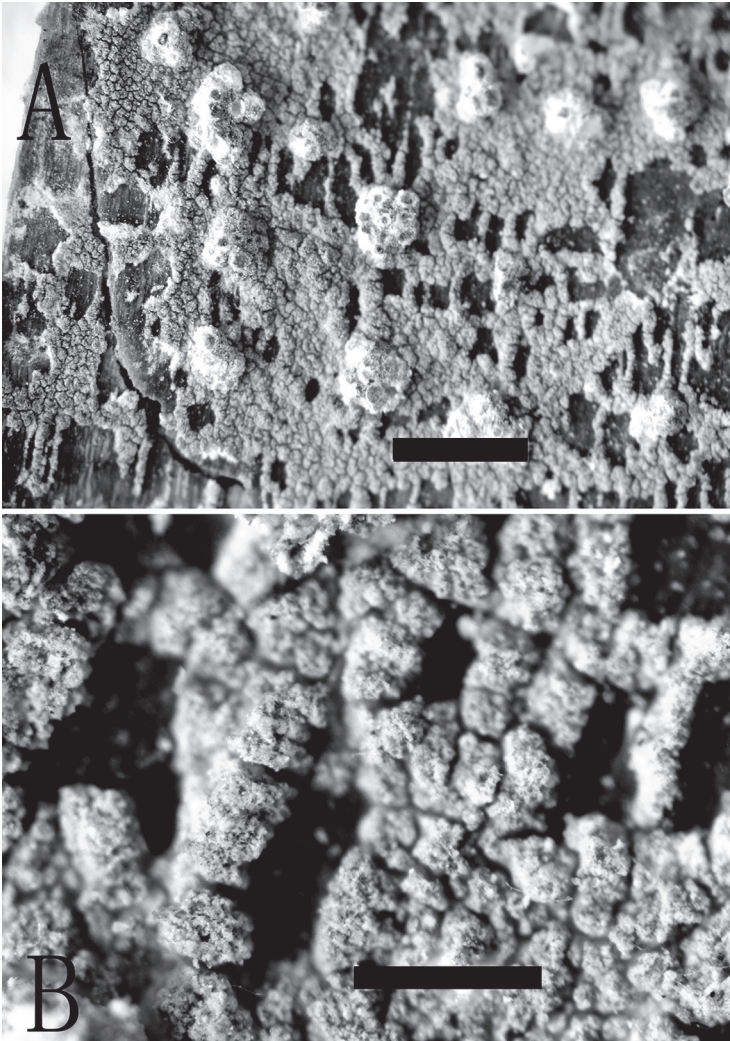


FIG. 1. *Phlyctis subargena* (holotype). A. Thallus (bar = 2 mm). B. Soralia (bar = 200 µm).

all contain norstictic acid. However, the former five are esorediate. Although *P. argena* is distinctly soorediate, *P. subargena* can be clearly separated from the former, which produces rare and solitary apothecia, only one spore per ascus, and larger spores ($100\text{--}150 \times 25\text{--}50 \mu\text{m}$). In addition, *P. argena* also contains a trace of conorstictic acid, which is absent in *P. subargena*.

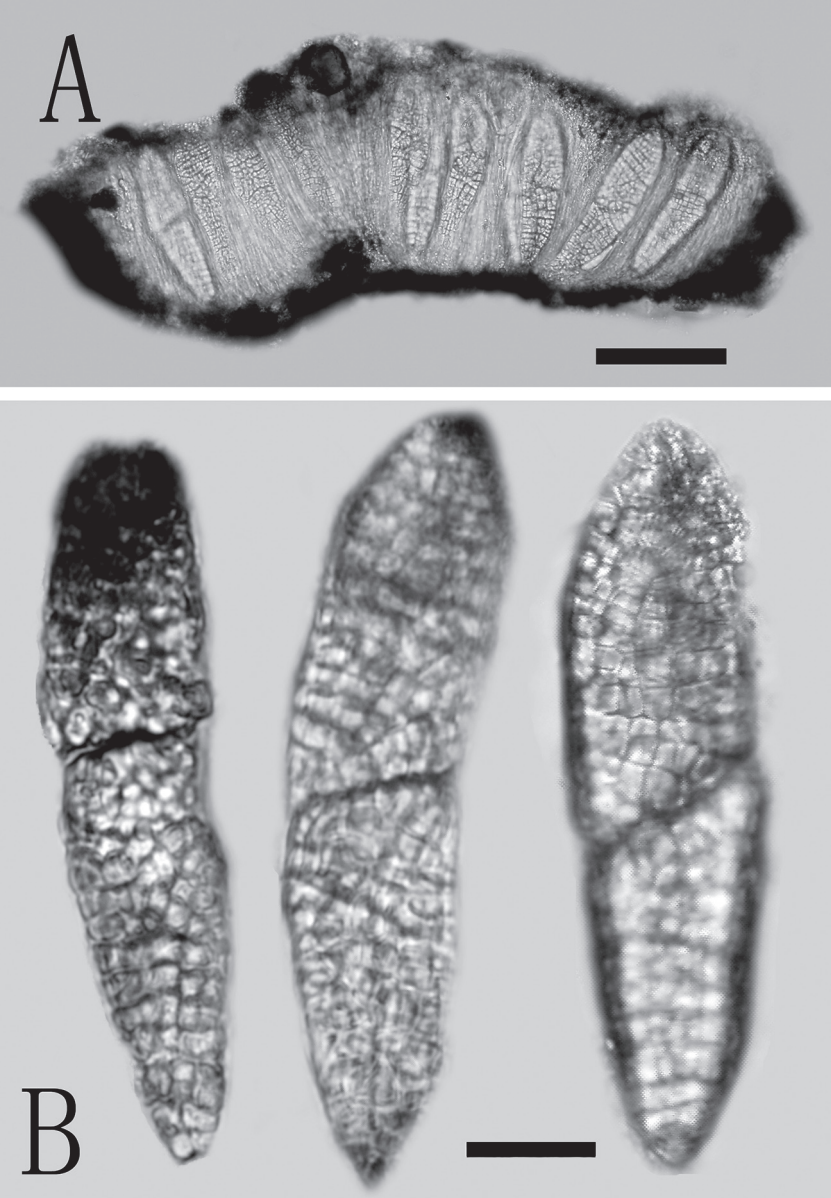


FIG. 1. *Phlyctis subargena* (holotype). A. Apothecium (bar = 50 µm).
B. Ascospores, showing 2-spored ascus and muriform shape (bar = 20µm).

Phlyctis subuncinata Stirt., which is also sorediate, differs from *P. subargena* in its fusiform spores and chemistry (stictic and cryptostictic acid vs. norstictic acid).

Acknowledgements

The project was financially supported by the National Natural Science Foundation of China (31070010) and Natural Science Foundation of Shandong Province (Y2007D21). The authors would like to thank Prof. A. Aptroot (CBS, AD Utrecht, Netherlands) and Dr. Zhong-Shuai Sun (College of Life Sciences, Zhejiang University) for the assistance in the specimen identification. The authors thank Dr. Irwin M. Brodo (Research Division, Canadian Museum of Nature, Canada), Prof. Shou-Yu Guo (Key Laboratory of Systematic Mycology & Lichenology, Institute of Microbiology, Chinese Academy of Sciences, Beijing, China) and Dr. Richard Harris (New York Botanical Garden, America) for presubmission reviews.

Literature cited

- Brodo IM, Sharnoff DS, Sharnoff S. 2001. Lichens of North America. Yale University Press: New Haven and London. 795 pp.
- Chen JB, Wu JN, Wei JC. 1989. Lichens. pp. 487–488, in: Fungi and Lichens of Shennongjia. World Publishing Corp., Beijing.
- Culberson CF. 1972. Improved conditions and new data for the identification of lichen products by a standardized thin-layer chromatographic method. *Journal of Chromatography* 72: 113–125. doi:10.1016/0021-9673(72)80013-X
- Galloway DJ, Guzmán G. 1988. A new species of *Phlyctis* from Chile. *Lichenologist* 20: 393–399. doi:10.1017/S0024282988000507
- Galloway DJ. 2007. *Phlyctis*. pp. 1184–1191, in: Flora of New Zealand. Lichens. 2nd ed., rev., including lichen-forming and lichenicolous Fungi. Vol. 2. Manaaki Whenua Press: Lincoln, New Zealand.
- Kirk PM, Cannon PF, Minter DW, Stalpers JA. 2008. Dictionary of the fungi. 10th Edition. CABI Bioscience: CAB International. 771 pp.
- Flotow J von. 1850. Lichenologische Beiträge zur Flora Europaea. *Botanische Zeitung* 8: 537–542, 553–559, 569–575
- Miadlikowska J, Kauff F, Hofstetter V, Fraker E, Grube M, Hafellner J, Reeb V, Hodkinson BP, Kukwa M, Lücking R, Hestmark G, Ojalora MG, Rauhut A, Büdel B, Scheidegger C, Timdal E, Stenroos S, Brodo IM, Perlmutter GB, Ertz D, Diederich P, Lendemer JC, May PF, Schoch C, Arnold AE, Gueidan C, Tripp E, Yahr R, Robertson C, Lutzoni F. 2006. New insights into classification and evolution of the *Lecanoromycetes* (*Pezizomycotina*, *Ascomycota*) from phylogenetic analyses of three ribosomal RNA- and two protein-coding genes. *Mycologia* 98: 1088–1103. doi:10.3852/mycologia.98.6.1088
- Purvis OW, Coppins BJ, Hawksworth DL, James PW, Moore DM (eds). 1992. The lichen flora of Great Britain and Ireland. Natural History Museum Publications & British Lichen Society, London.
- Tønsberg T. 2004. *Phlyctis*. pp. 415–416, in: Nash. TH III, Ryan BD, Diederich P, Gries C, Bungartz F (eds). Lichen flora of the Greater Sonoran Desert Region, Vol. 2. Lichens Unlimited: Arizona State University, Tempe, Arizona.

- Wedin M, Wiklund E, Crewe A, Döring H, Ekman S, Nyberg Å, Schmitt I, Lumbsch HT. 2005. Phylogenetic relationships of *Lecanoromycetes* (*Ascomycota*) as revealed by analyses of mtSSU and nLSU rDNA sequence data. *Mycological Research* 109: 159–172. doi:10.1017/S0953756204002102
- Wei JC. 1991. An enumeration of lichens in China. International Academic Publishers: Beijing. 278 pp.