
Dioscorea bulbifera var. *albotuberosa* (Dioscoreaceae), a New Variety from Yunnan, China

Zhou Yifeng, Xu Zenglai, Hang Yueyu*, and Ding Zhizun

Institute of Botany, Jiangsu Province, and Chinese Academy of Sciences (Nanjing Botanical Garden, Mem. Sun Yat-Sen), Nanjing, 210014, People's Republic of China. *Author for correspondence: hangyueyu@21cn.com

ABSTRACT. A study of the diversity of *Dioscorea bulbifera* L. (Dioscoreaceae) in China has revealed a distinctive new variety from Yunnan Province, China. *Dioscorea bulbifera* var. *albotuberosa* Y. F. Zhou, Z. L. Xu & Y. Y. Hang differs from *D. bulbifera* by its tubers white in transverse section, bulblets verruculose, and leaf texture membranaceous, papery, and crispy when dry.

Key words: China, *Dioscorea*, Dioscoreaceae, IUCN Red List, Yunnan.

Dioscorea bulbifera L. is distributed widely in Africa and Southeast Asia. According to Knuth (1924) and Prain and Burkill (1936), the species has 10 varieties, all with tubers yellow in transverse section, with three varieties (*D. bulbifera* var. *bulbifera*, *D. bulbifera* var. *simbha* Prain & Burkill, and *D. bulbifera* var. *heterophylla* Prain & Burkill) distributed in China. From 2002 to 2005, we committed ourselves to the revision of Chinese *Dioscorea* L., examining the specimens in five Chinese herbaria (KUN, HITBC, NAS, PE, South China Institute of Botany Academia Sinica). This paper validates the new variety as *D. bulbifera* var. *albotuberosa* Y. F. Zhou, Z. L. Xu & Y. Y. Hang.

1. *Dioscorea bulbifera* L., Sp. Pl. 2: 1033. 1753.

TYPE: tab. 217 in Hermann, *Parad. Bat.*, 1698 (lectotype, designated by E. Milne-Redhead, 1975: 9–10, tab. 217, Hermann, 1698).

1a. *Dioscorea bulbifera* var. *albotuberosa* Y. F. Zhou, Z. L. Xu & Y. Y. Hang, var. nov. TYPE: China. Yunnan: near Lancangjiang, Yong-jing-hong, 22°00'N, 100°47'E, 500 m, 24 Dec. 1957 (fr.), C. T. Ting, T. S. Wang & J. S. Yue 0143 (holotype, NAS). Figure 1.

Haec varietas a ceteris varietatibus sinensibus tubere in sectione transversali albo, bulbillis verruculosus atque laminis foliaceis membranaceis distinguitur.

Stems twining to left, glabrous, smooth, cork black; bulblets brown, bitter-tasting with horned protuberances, variable in size, 0.3–0.9 cm diam., verruculose;

tubers usually solitary, renewed annually, ovoid or pear-shaped, 2–8 cm diam., white in transverse section. Leaves alternate, simple, with petioles 5–8.5 cm, widely ovate, deeply cordate at base, tapering to cuneate apices, membranaceous, thin papery, crispy and splitting when dry, 6–8.5(–12) × 5–10 (–14.5) cm, glabrous, margin entire or slightly undulate, apex acuminate. Inflorescences spiciform; male spikes usually clustered in leaf axils or along leafless, axillary shoots, male flowers solitary along rachis, bract and bracteole ovate, base broad, apex acuminate; female spikes often 2 or 3 together, spikes drooping, 12–20 cm. Male flower sepals 2–3 mm with a purple perianth, corolla lobes lanceolate, ca. 2 mm; stamens 6, 0.6–0.8 mm, inserted at base of perianth, filaments nearly as long as anthers; female flowers similar to male, but with 6 staminodes, 3 spinous, ca. 1 mm, 3 as minute protuberances. Immature fruit green, drooping, reflexed at maturity; mature fruit straw-colored with dense purple maculae, oblong-globose, 2–3 cm long, glabrous; seeds inserted near apex of capsule, 1.2–1.6 × 0.4–0.5 cm, dark brown, seed wing pointing toward capsule base.

Distribution and habitat. *Dioscorea bulbifera* var. *albotuberosa* is distributed in forests, mixed forest margins, thickets, riverbanks, and along valleys, near 300 to 1600 m in southwest Yunnan.

IUCN Red List category. We assess the conservation status of this new variety as Vulnerable (VU B1) according to IUCN Red List criteria (IUCN, 2001), because it is estimated to be found in fewer than 10 locations and its geographic range is less than 20,000 km².

Phenology. Flowering from August to November; fruiting from September to December.

Relationships. *Dioscorea bulbifera* var. *albotuberosa* is a new variety of *D. bulbifera*, which is included in the section *Opsophyton* Uline. This section is distinguished by the usually solitary tubers, flowers with lanceolate lobes, six stamens ca. 1/4 as long as perianth lobes, reflexed capsules, and seed wings

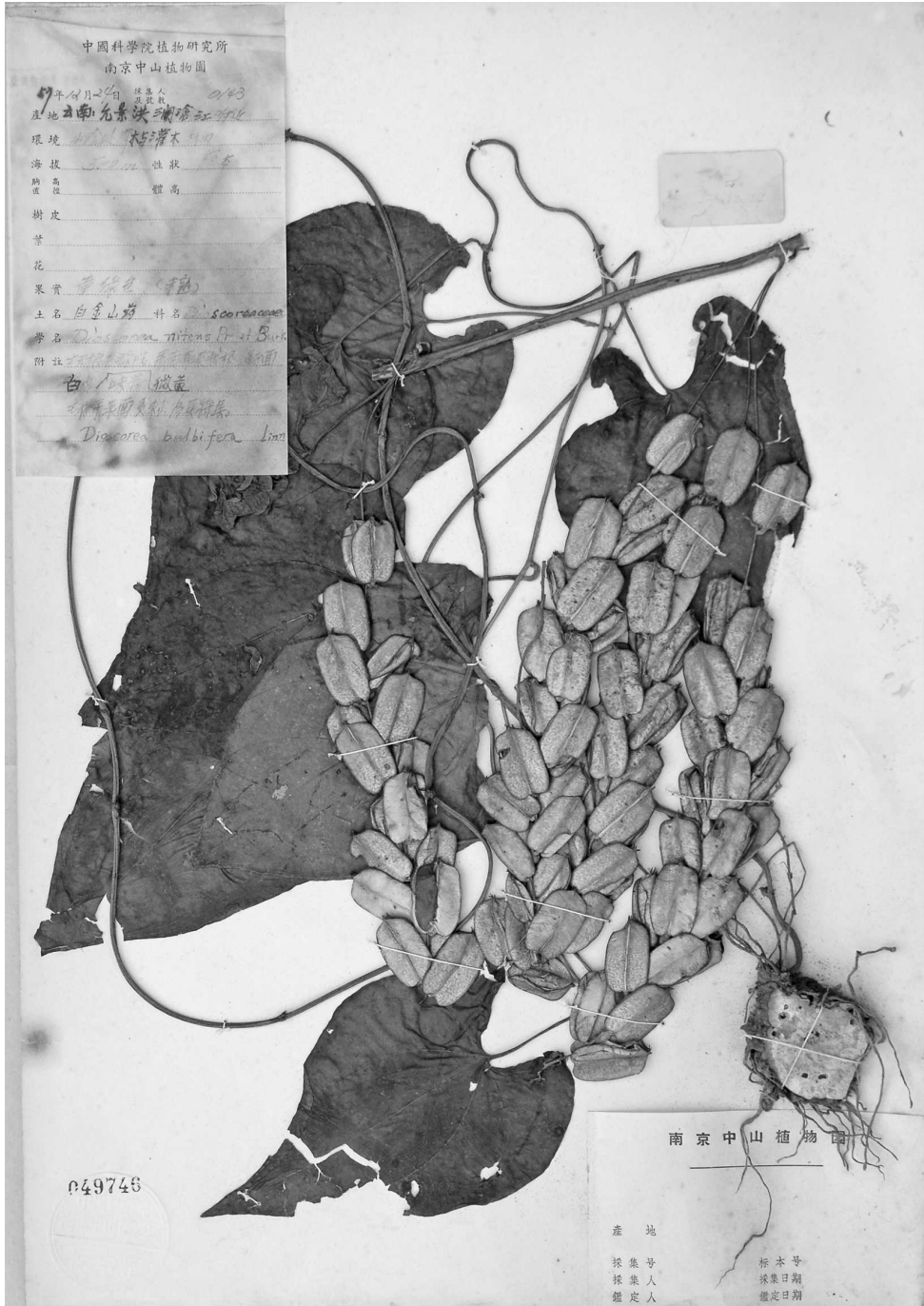


Figure 1. Holotype of *Dioscorea bulbifera* var. *albotuberosa* Y. F. Zhou, Z. L. Xu & Y. Y. Hang (*C. T. Ting, et al.* 0143, NAS). Photo by Songhu Tian.

inserted near the capsule apex (Ding & Michael, 2000). The new variety differs by the tubers white in transverse section, the verruculose bulblets, and the leaf texture membranaceous and thin papery.

Paratypes. CHINA. **Yunnan:** Mong-la, 4 Dec. 1959 (♂), *Ch. Q. Pei s.n.* (KUN 0241801); Mong-hain or Gan-lan-ba, Che-li Hsien, Oct. 1936 (♂), *C. W. Wang s.n.* (PE 00153582); Mong-la or Mong-pa, 19 Jan. 1964 (♀), *C. T. Ting, T. S. Wang & J. S. Yue 295b* (NAS 0422132); Meng-long, Yong-jing-

hong, 21 Dec. 1957, C. T. Ting, T. S. Wang & J. S. Yue 0117 (NAS).

KEY TO THE VARIETIES OF *DIOSCOREA BULBIFERA* IN CHINA

- 1a. Tubers yellow in transverse section; bulblets globose or ovoid with orbicular spots; leaves chartaceous, not splitting when dry.
 - 2a. Leaves cordate or long cordate, base long cordate.
 - 3a. Male flowers with the sepals to 2–3 mm long. *D. bulbifera* var. *bulbifera*
 - 3b. Male flowers with the sepals to 4 mm long. *D. bulbifera* var. *simbha*
 - 2b. Leaves sagittate, base triangular-cordate when young *D. bulbifera* var. *heterophylla*
- 1b. Tubers white in transverse section; bulblets irregular with verrucae; leaves widely ovate, deeply cordate at base, membranaceous, crispy when dry *D. bulbifera* var. *albotuberosa*

Acknowledgments. We are grateful to the curators of PE, KUN, HITBC, South China Institute of Botany Academia Sinica, and NAS for allowing us to study their specimens. We especially thank X. F. Jin and H. Z. Qin for reviewing the manuscript. The research was

supported by the National Natural Science Foundation of China (no. 30270108) and the Chinese Academy of Sciences botanical garden and taxonomic research projects (no. KSCX2-YW-Z-028).

Literature Cited

- Ding, Z. Z. & G. G. Michael. 2000. Dioscoreaceae. Pp. 286–287 in Z. Y. Wu & P. H. Raven (editors), *Flora of China*, Vol. 24. Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.
- Hermann, P. 1698. *Paradisus batavus*,... Abrahamum Elzevier, Lugduni-Batavorum [Leiden].
- IUCN. 2001. IUCN Red List Categories and Criteria, Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.
- Knuth, R. 1924. Dioscoreaceae. Pp. 88–91 in H. G. A. Engler (editor), *Das Pflanzenreich*, Vol. 43. Verlag von Wilhelm Engelmann, Leipzig.
- Milne-Redhead, E. 1975. Dioscoreaceae. Pp. 9–10 in R. M. Polhill (editor), *Flora of Tropical East Africa*. Whitefriars Press Ltd., London.
- Prain, D. & I. H. Burkill. 1936. An account of the genus *Dioscorea* in the East (I). *Ann. Roy. Bot. Gard. (Calcutta)* 14(1): 111–132, pl. 49–51.