



Taxonomic notes on *Castanopsis* (Fagaceae, Castaneoideae) from China

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Abstract

The taxonomy of some Chinese *Castanopsis* species is clarified in the present paper. *C. semifabri* is accepted as the taxonomically correct name, having priority over *C. ledongensis*. *C. wuzhishanensis* is treated as a new synonym of *C. semifabri*. *C. qiongbeiensis* described from Hainan is a new synonym of the widely distributed and more variable *C. chinensis*. *C. lantsangensis* and *Quercus pinfaensis* are reduced to synonyms of *C. ceratocantha* and *C. eyrei* rather than synonyms of *C. mekongensis* and *C. fargesii*, respectively. The variety *C. carlesii* var. *spinulosa* is subsumed as a new synonym of *C. carlesii*. *C. formosana* is resurrected as a separate species rather than treated as a synonym of *C. jucunda*. In addition, an accurate description of *C. wenchangensis* is given to replace the inaccurate one given in *Flora Reipublicae Popularis Sinicae* and *Flora of China*.

Introduction

Castanopsis (D. Don 1825: 56) Spach (1841: 142, 185) (Fagaceae, Castaneoideae) is the third largest genus in Fagaceae and is widely distributed across tropical and subtropical Asia as far north as the Yangtse River of China, Korea, and Japan, as well as the Himalayas (Camus 1929, Barnett 1944, Kaul 1988, Huang & Chang 1998). In the first major revision of the genus, Camus (1929) described 112 species and based on the characteristics of cupules recognized three sections (*Eucastanopsis*, *Callaeocarpus*, and *Pseudopasania*). Subsequently, her work was complemented by Barnett (1944), who recognized 119 species divided into 11 groups on the basis of the characteristics of cupules, nuts and leaves. Soepadmo (1972) recognized 34 species in Malesia based on fruiting specimens. Later, Govaerts & Frodin (1998) recognized 134 species of *Castanopsis*, with ca. 62 species recorded in China.

The taxonomy of the *Castanopsis* of China has been the subject of extensive study (e.g. Hu 1949, Cheng *et al.* 1963, Hsu & Jen 1975, Liao 1996, Wang & Chang 1996, Huang & Chang 1998, Huang *et al.* 1999, Liu 2009). Huang & Chang (1998) and Huang *et al.* (1999) made comprehensive revisions of Chinese *Castanopsis*, and on the basis of vegetative and cupular characteristics recognized respectively 63 or 58 species in China. However, some distinct species were mistakenly synonymized, and a number of species described by other authors (Fu & Huang 1989, Chen & Yu 1991, Fu & Feng 1992, Fu 1994) were not included in their monographs. Recently, some new species published by Fu (2001) on the basis of a small number of specimens from Hainan have descriptions that differ only slightly from previously published species. The aim of this study is to better understand the variation of morphological characters and to further revise Chinese *Castanopsis*.

Materials and Methods

Over the last few years, we made five expeditions to various areas in China where *Castanopsis* is found to record the morphological variations and biological features. We also subjected to careful examination the *Castanopsis* specimens deposited at CAF, CDBI, HF, HIB, HITBC, IBK, IBSC, KUN, LBG, PE, SWFC and SYS. We also obtained images of type specimens of *Castanopsis* species from the curators of A, AMES, B,

After examining the type specimen of *Castanopsis wenchangensis* G.A. Fu & C.C. Huang and comparing its original description with that in *Flora Reipublicae Popularis Sinicae* (Huang & Chang 1998) and *Flora of China* (Huang *et al.* 1999), we find that Huang & Chang (1998) and Huang *et al.* (1999) mistakenly interpreted *C. wenchangensis* as *C. glabrifolia* J.Q. Li & Li Chen (2011: 317). *C. wenchangensis* is distinguished from *C. glabrifolia* by its global cupules with longer spines, pubescent branches, leaves and rachis of inflorescences. The description of *C. wenchangensis* according to Fu and Huang (1989) and the holotype specimen was given as the following:

Trees. Second-year branches grey black with slightly raised lenticels. First-year branches, petioles, leaves abaxially, midvein from base to middle adaxially, rachises of inflorescences and perianth segments covered with grey pubescences and brown scales. Petiole 0.8–1.4 cm. Leaf elliptic or ovate-elliptic, 4.5–6.5 × 1.9–3.1 cm, leathery, base acute or broadly cuneate, margin very shallow serrate from middle to apex, often slightly curled abaxially, apex short acuminate; midvein adaxially impressed, secondary veins 6–9 pairs on each side of midvein, impressed adaxially. Rachis of infructescences 10 cm, 1.5 mm thick. Cupule globose, 1.4–2.0 cm in diameter, cupule outside covered with sparsely grey pubescent spines, spines 0.6–1.5 cm long, basally connate. Nut 1 per cupule, conical, 12 mm in diameter, densely brown pubescent; scar basal.

Acknowledgements

This work was financially supported by grants from the National Natural Science Foundation of China (no. 30770151). We thanked Prof. M.X. Jiang (Wuhan Botanical Garden, CAS) for providing materials from Taiwan. We are grateful to Julian Harber and an anonymous reviewer for comments that improved the manuscript.

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Specimens examined (if not designated, specimens are deposited in IBSC):

C. carlesii — CHINA. **Chongqing**, Nanchuan, T.T. Yu 2966 (PE), G.F. Li 60530 (PE), 60899, 61243, 64350, J.H. Xiong & Z.L. Zhou 9309 (PE), W.P. Fang 820 (PE), K.L. Chu 904, 1016, Mt. Jinyun, T.C. Pan 47 (PE). **Fujian**, Dehua, P.C. Tsoong 377, Fuzhou, Z.P. Jian *et al.* 401783 (PE), 401779 (PE), H.H. Chung 2234, C.C. Huang 817, L.G. Lin 1735, Y.C. Hsu 63046 (SWFC), Z.Q. Li s.n. (SWFC), W.R. Carles s.n. (K), Jianyang, Z.P. Jian *et al.* 400224 (PE), Longyan, R. Lin 4349 (PE), Mingxi, L.G. Lin 5604 (PE), Nanjing, R.C. Lin 3341, G.D. Ye 1308, Shaowu, H.C. Zhou 6263, Shunchang, G.S. He 308 (PE), Songxi, G.S. He 7423, Mt. Wuyi, M. Suzuki *et al.* 98133 (PE), Mt. Wuyi Exped. 1986, Yong'an, P.C. Tsoong 4765 (PE), Yongchun, P.C. Tsoong 328, Locality unknown, S.M. Huang 190272, Fudan Univ. Exped. 58854, C.F. Yang 195 (PE), D.L. Liu s.n. (PE), anonymous 242. **Guangdong**, Conghua, S.H. Chun 17374, L. Teng 8542, Dapu, W.T. Tsang 21034 (PE), 21273, Fengkai, C. Huang 164483, 164498, G.Q. Ding & L. Yu 6527, 6648, anonymous 409, Fengshun, S.K. Lee 201450, H.G. Ye *et al.* 4287, Foshan, P.C. Tam 64053, Gaoyao, J.Q. Zhang 83316, Guangzhou, C.O. Levine 4624 (PE), Heping, Heping Exped. 826, B.M. Zhang 152863, Huaiji, B.M. Zhang 20310, H.G. Ye *et al.* 3110, Y.G. Liu 2728, G.L. Shi 14566, Jiexi, H.G. Ye *et al.* 4521, Lechang, B.Y. Chen *et al.* 261, L.H. Qiu 20207, S.H. Chun 3208, Z.Z. Cao & J. Wang 4352, Liannan, Z.S. Zhu 60931, P.C. Tam 58888, Lianshan, P.C. Tam 58091, 58768, H.G. Ye *et al.* 4906, 3484, F.Y. Zeng *et al.* 748, Longmen, Mt. Nankun Exped. 71092, Nanxiong, L. Teng 6362, Qujiang, X.P. Gao 50261, Ruyuan, N.H. Xiao & N. Liu 208, 334, Yue73 446, 452, 2366 Exped. 3040, C. Wang 42211, Guangdong Wood Exped. 34, 40, Nanling Exped. 1965, Wengyuan, S.K. Lau 2726, 24405, Xinyi, C. Wang 31188, 32061, 37905, Zhanjiang Exped. 4140, Yangchun, Nanzhidi Exped. 47, J.H. Liu & J. Xiao 89830, Yangjiang, Z.X. Li & F.W. Xing 2272, Yangshan, Mountain vegetation team 267, Yingde, B.H. Liang 84085, 84175, 84297, Department of Biology, SYSU, Exped. 80, W.D. Xu 8558, W.T. Tsang 2915, Zengcheng, W.T. Tsang 20282, 20379, Zhaoqing, G.Q. Ding & G.L. Shi 152, G.L. Shi 259, 13299, 367, 12656, 64, Locality unknown, X.Z. Wang 9, S.S. Sin 9311, Nanzhidi Exped. 4104, C.Y. Wu 81-1301 (KUN). **Guangxi**, Chongzuo, H.Y. Liang 67344, 67368, Daxin, S.H. Chun 12204, Fangcheng, X.Z. Wang 51, S.H. Chun 4066, 4816, 4822, W.T. Tsang 26731, Gongcheng, Y.K. Li 402891, Hezhou, Y.K. Li 401469, X.C. Chen *et al.* 500141, Hengxian, Z.Y. Chen 50381, Jinxiu, S.S. Sin 8074, Q.H. Lu 4787 (KUN), Mt. Dayao Exped. 12036, 12329, Y.K. Li 400425, Q.H. Lu 4787, Lingshan, Hepu of Guangdong Exped. 2180, Longlin, Y.K. Li 540, 583, Longsheng, Guangfu Forestry Region Exped. 1030, Longsheng Exped. 162, 180, 50063, S.F. Yuan & L.F. Liu 5942, H. F. Tan & Z.T. Li 71073, Z. T. Li & Y.C. Chen 600068, Luchuan, C.H. Tsoong 809153, Luocheng, W. Chen 84165, Nanpo, S. China Exped. 268, X.P. Gao 55975, Pingnan, C. Wang 39069, Pubei, G.F. Chen 89374, Qinzhou, Hepu of Guangdong Exped. 2633, W.Q. Chen 486, Nanzhidi Exped. 2633, S.H. Chun 4137, Rongshui, J.Q. Li 1974 (HIB), S.H. Chun 14732,