

## 东亚粗叶木属 (茜草科) 植物纪要

朱 华

(中国科学院西双版纳热带植物园, 云南勐腊 666303)

**摘要** 修订了东亚茜草科粗叶木属植物, 新归并 11 个种名及 2 个变种名, 建立 1 个新变种、3 个新组合变种和 1 个新等级亚种, 报道 2 个中国分布新记录种。讨论了一些易于混淆种的界限, 以及探讨了一些种的植物地理意义。

**关键词** 粗叶木属, 茜草科, 订正, 东亚

**分类号** Q949

## Notes on the Genus *Lasianthus* Jack (Rubiaceae) from Asia

ZHU Hua

(Xishuangbanna Tropical Botanical Garden, The Chinese Academy of Sciences, Mengla, Yunnan 666303)

**Abstract** Eleven species names and two variety names are reduced to new synonyms. Three new combinations and one new state are made. Two species are reported new to China. One new variety is established. The delimitation of some species that are easily confused are clarified, and geographical significance of some species is discussed.

**Key words** *Lasianthus*, Rubiaceae, Revision, Asia

*Lasianthus* Jack is a large genus about 140 species in the family Rubiaceae. It occurs from tropical Asia (c. 120 species) and Australia (only one species) to tropical Africa (c. 20 species) as well as tropical America (2 species) but has the center of species diversity in tropical Asia (Robbrecht, 1988). Most species of the genus occur in primary forests. They are usually common shrub species in rain forests of tropical Asia. The genus is especially important in the research of tropical and subtropical forests of southeast Asia not only because it has relatively high phytosociological importance value in the understory but also because some species of the genus are often characteristic species for a forest type (i. e. 'marker species'). Furthermore, some species may have important geographical and ecological significance in reference to the tropical and subtropical forests of southeast Asia.

The genus is extremely difficult taxonomically and the delimitation of some species is very obscure. In the absence of a thorough revision there is still considerable confusion and misidentification in the genus. However, there are regional revisions—India—Burma by Deb & Gang. (1991) and *Lasianthus* section *Pedunculatae* as *Litosnathes* (1989); Malay by Wong. (1989); as well as Zhu (1994). The author published a taxonomic revision of the genus from China (1994) in which 31 species including 4 subspecies and 10 varieties were recognized. In an opportunity to visit **K** (Herbarium of Royal Botanic Gardens, Kew), **BM** (Herbarium of Botany Department of the

\* This project was supported by the fund of the Chinese Academy of Sciences

Received: 1997- 02- 26, Revised: 1997- 06- 03

British Natural History Museum), **E** (Herbarium of Royal Botanic Garden Edinburgh), **P** (Herbarium of Laboratoire de Phanerogamie, Museum National d' Histoire Naturelle, Paris) and **BKF** (Forest Herbarium of the Royal Forest Department, Thailand), the author made a full check of the specimens of *Lasianthus* and consequently considered that it is necessary to give a revised opinion on certain species as an appendix to the former publication<sup>①</sup>.

## TAXONOMIC REVISION<sup>②</sup>

***Lasianthus biermannii*** King ex Hook. f., Fl. Brit. India. 3: 190 (1880); Levl., Cat. Pl. Yunnan.: 246 (1917); Icon. Corm. Sin. 4: 251, f. 5913 (1975); C. Y. Wu, Index Fl. Yunnan. 2: 1259 (1984); H. Li in C. Y. Wu ed., Fl. Xizang. 4: 451, pl. 192, f. 5~6 (1985); H. Zhu in Acta Phytotax. Sin. 32 (1): 74 (1994). Type: Sikkim, Yoksum, T. Thomson s. n. (K) — *Litosanthes biermannii* (King ex Hook. f.) Deb et Gang. in Candollea. 44: 211. f. 1. (1989).

### a. subsp. **biermannii**

Distribution: China (Yunnan, Xizang), Burma, India (NE part), Sikkim.

Additional specimens: China: Yunnan: Gongshan, T. T. Yu 19930, 18080 (E), 1 200 m alt., K. M. Feng 24220 (KUN), Forrest 17871 (BM), Forrest 7968 (K), 800~1 680 m alt. Dulong River Exp. 6974, 6711, 6598, 5036, 900, 1332, 1425, 1501, 3089, 3337, 4693 (KUN); Bi Jiang (Fugong), 2 000 m alt. Z. G. He 178-0028 (KUN), Bi Jiang Exp. 0920 (KUN); Lianghe, G. D. Tao 012988 (KUN). Burma: Kachin, Keenam 3910 (E); E Burma, Lashi, Ward 1622 (E); Tamai, Kingdon-Ward 13241, 17299, 13548 (K, BM); North Triangle, Kingdon-Ward 21410 (BM). India: Khasia, Griffith 2931; Assam, Cox et Hatchison. 388; Manipur, Watt 6359; Darjeeling, Gamble 8358 (E), Lace 2456 (E), 2203 (E), Cowan s. n. (E). Sikkim: Macpherson 8 (E), Stainton 5339 (E), Long 142 (E), Griffith s. n. E. Ind. Comp. no. 29322 (Paratype, K). E. Himalaya: Labdah, Cave s. n. (E); Surei (6000 ft.), Cave s. n.; Rongle, Cave s. n. (E).

b. subsp. **crassipedunculatus** C. Y. Wu et H. Zhu, H. Zhu in Acta Phytotax. Sin. 32 (1): 75 (1994). Type: Yunnan: Maguan, Wu Quan-an 8533 (KUN). — *L. esquirolii* Levl. in Fedde Report. Spec. Nov. Regni Veg. 11: 295 (1912); Ferguson in Lauener, in Notes Roy. Bot. Gard. Edinburgh. 32 (1): 109 (1972). Type: China, Guizhou, J. Esquirol 684 (E) syn. nov. — *Lasianthus biermannii* sensu Hutch. in Sarg., Pl. Wilson. 3: 402 (1916); Rehd. in J. Arnold Arbor. 16: 323 (1935), non King ex Hook. f. (1880). — *Lasianthus octonervis* sensu C. Y. Wu, Index Fl. Yunnan 2: 1259 (1984), non Hand. - Mazz. (1934).

Distribution: China (Yunnan, Guizhou, Hainan).

Additional specimens: China: Yunnan: Henry 11148; Ping-bien, Wang Hong 90-22024 (HITBC); Fuling, Q. A. Wu 9590 (KUN); Luchun, D. D. Tao 318 (KUN). Hainan, E. Hainan Exp. 576 (SCBI).

This subspecies differs from the typical subspecies in having densely appressed hairs on branches and leaf nerves beneath, parallel and conspicuously elevated veinlets beneath, lanceolate calyx lobes and robust peduncles usually longer than petioles.

①Zhu H, 1994. A taxonomic study on the genus *Lasianthus* Jack in China. *Acta Phytotax Sin*, **32** (1): 49~81

②The specimen cited in this paper are the additional ones checked by author than the ones cited in author's former paper. The specimens without citation of the code of herbaria are in K; The specimens in more than K are cited by the codes of the herbaria.

Rehder (1935) considered that Henry 11148 from Yunnan province of China cited by Hutchinson as *L. biermannii* King ex Hook. f. matched the type specimen (*J. Esquirol* 648) of *L. esquirolii* L vl. from Guizhou province of China, so he reduced *L. esquirolii* L vl. to a synonym of *L. biermannii* King ex Hook. f. However, Ferguson (1972) contended that the type of *L. esquirolii* L vl. did not sufficiently match the type of *L. biermannii* King ex Hook. f. and again recognized *L. esquirolii* L vl as a separate species. Many specimens from Southeast Yunnan and Hainan as cited in 1994, show relationship with *L. biermannii* King ex Hook. f. but clearly differ. I accepted them as a geographical subspecies of the latter in the previous paper (Zhu, 1994). After the type of *L. esquirolii* L vl. was checked, I was convinced that it was the same as the subspecies *crassipedunculatus*.

**Lasianthus brevidens** Craib in Kew Bull. 1933: 19. 1933. Type: Thailand, Rachaburi, Prachuap. 700 m, Kerr 10833 (K, Isotype BM). — *Lasianthus bunzanensis* Simizu in Trans. Nat. Hist. Soc. Formos. 34: 301. 1944; Liu et Chao in Taiwan 10: 121, f. 3. 1964; Chao in Fl. Taiwan 4: 286, pl. 1004. 1978; H. Zhu in Acta Phytotax. Sin. 32 (1): 73. 1994. syn. nov. (Type: Taiwan: Taipei, Suzuki 16385 non vidi.) (TIU).

Distribution: China (Taiwan, Hainan, Yunnan), Japan, Philippine, Thailand, Vietnam.

Additional specimens: **China:** Yunnan, Jiang-chen, *G. D. Tao* 8266 (HITBC). Japan: Ryukyu, Okinawa, *Furuse* 4949, 13452. **Philippine:** Mindanao, *Elmer* 13613 (E). **Thailand:** Ranuary, *Kerr*. 16652 (BM); Pattani, *Kerr* 7776 (BM). **Vietnam:** Tonkin, Ha-coi, *W. T. Tsang* 27091 (E).

The specimens from Hainan province of China and Ryukyu, Vietnam and Philippine almost exactly agree with the type of *L. brevidens* Craib. The author has not seen the type of *L. bunzanensis* Simizu, however, the description and the fewer specimens seen from Taiwan strongly suggest that it be conspecific with *L. brevidens* Craib.

**Lasianthus chevalieri** Pitard in Lecomte, Fl. Gen. Indo-Chine 3: 384 (1924). Type: Vietnam, Annam, Lang-bian (1500~2000 m alt.), *A. chevalier* 30383 (Holo., P). — *Lasianthus longisepalus* Geddes in Kew Bull. Misc. Inform. 1928: 245 (1928); Craib, Fl. Siam. 2 (1): 213 (1934); H. Zhu in Acta Phytotax. Sin. 32 (1): 63 (1994). syn. nov. Type: Thailand: Chantaburi, *Kerr* 9632 (K). — *L. longisepalus* Geddes var. *jianfengensis* H. S. Lo in Bot. J. S. China 1993: 4 (1993). syn. nov. Type: China, Hainan, *Hainan Expedit.* 203 (SCBI).

Distribution: China (Hainan); Vietnam; Thailand.

Additional specimens: **China:** Hainan, *Lau* 5221 (E). **Thailand:** Krat, *Put* 2987, *Kerr* 17811; Chantabun, *Kerr* 9432; Chantaburi, *Beusekom et Smitinant* 2203 (E), *Iwatsuki et al.* 7138 (BKF), *Smitinand* 5472 (BKF), *Shimizu et al.* 23760 (BKF), 23735 (BKF). **Vietnam:** Annam, Lang Bian, *Tixier* s. n. (P); Manline (Dalat), *Tixier* 6 (P).

*L. longisepalus* Geddes var. *jianfengensis* H. S. Lo from Hainan Island of China can not be clearly distinguished from the typical variety from Thailand, while *L. chevalieri* Pitard from Indo-China also can not be clearly discerned from either of them. This strongly suggests that they are conspecific.

**Lasianthus curtisii** King et Gamble in J. Asiat. Soc. Bengal. 73: 128 (1904); Ridley, Fl. Malay Penins. 2: 161 (1923); Craib, Fl. Siam. 2 (1): 209 (1934); Yamazaki in J. Jap. Bot. 39 (1): 352 (1964) pro parte

excl. syn. *L. formosensis* Matsum. var. *parvifolius* Hatusima; Liu et Chao in Taiwan. 10: 126. f. 5 (1964); Chao in Fl. Taiwan 4: 289, pl. 1006 (1978); H. Zhu in Acta Phytotax. Sin. 32 (1): 64 (1994). Type: Malay: Penang, Curtis 284 (K). — *L. formosensis* Matsum. var. *hirsuta* Matsum. in Bot. Mag. (Tokyo) 15: 17 (1901). — *L. kwangtungensis* Merr. in Lingn. Sci. J. 7: 323 (1929), ibid. 9: 44 (1930), ibid. 11: 56 (1932); Fl. Hainan 3: 336 (1974); Icon. Corm. Sin. 4: 246, fig. 5905 (1975). Type: China, Hongkong, Y. Chiang 55 (SCBI) (Isotype, K) — *L. condorensis* Pierre ex Pitard in Lecomte, Fl. Gen. Indo-Chine 3: 385 (1924). syn. nov. Syntypes: Vietnam: Tonkin, Bavi, Balansa 2658 (P); Annam, Quang-tri, Eberhardt 1981 (P); Cochinchina, Condor, Harmand 916 (P).

Distribution: China (Guangxi, Guangdong, Hongkong, Hainan, Taiwan), Japan (Kyushu, Ryukyu), Vietnam, Thailand, Malaysia and Indonesia (Java).

Additional specimens: **China:** Guangdong, Dinghu Mt. collector unknown 15819 (SCBI); Taiwan, s. n. (no. herb. 187724, 187745) (SCBI). **Japan:** Ryukyu, Okinawa, Furuse 4899; Menokawa, Murata et al. 17728 (SCBI). **Thailand:** Loei, Chant 90127, Murata et al. 42684 (BKF); Surat, Put 1189 (K, E); Kerr 15952 (E). **Indonesia:** Java, Bangka, Kostermans & Anta 92. **Vietnam:** Tonkin, W. T. Tsang 29874; Fancheng-Tonkin, W. T. Tsang 26718 (SCBI).

**Lasianthus inodorus** Bl., Bijdr.: 998 (1826); Backer et Bakhuizen, Fl. Java 2: 339 (1965). Typus non vidi. — *L. tubiferus* Hook. f., Fl. Brit. India 3: 183 (1880); Craib, Fl. Siam. 2 (1): 219 (1934); Deb et Gang. in J. Econ. Taxon. Bot. 15 (2): 305. fig. 14 (1991); Zhu in Acta Phytotax. Sin. 32 (1): 59 (1994). syn. nov. Lectotype: Khasia, Hook. f. et Thomson, s. n. (K) (selected by Deb & Gangopadhyay in 1985). — *L. poilanei* Pitard in Lecomte, Fl. Gen. Indo-Chine 3: 398 (1924). syn. nov. Type: Cambodia, Mt. Elephant, 1 000 m, Poilane 234 [Holo. P, Iso. E & K].

Distribution: China (Yunnan), India (northeast part), Bangladesh (eastern Part), Thailand, Cambodia and Indonesia (Java).

Additional specimens: China: Yunnan, Jinghong, Mengsong, 1600 m. alt., H. Zhu et H. Wang 940401 (HITBC). **Indonesia:** SE Java, Forbes 1085; Gibodas, Aya Nitta 15186; Gede, Ridley s. n., Koorders 23209B; Zollinger 4817 (P). **Thailand:** Songkla, Larsen et al. 40945 (BKF); Krat, Put 2988; Suwann, Kerr 6063; Nakon Sanvan, Kerr 4063; Doi Angka, Garrett 384, 879 (BKF); Chantaburi, Beusekom et Smitinand 2202 (E); Nakhon Ratchasima (1 200 m alt.), Beusekom et Charoenpal 1697 (E); Loei (1300 m alt.), Beusekom et al. 4550 (P), Murata et al. (1 200 m) 42896 (BKF); Udawn, Tajawa et al. 473, 1214 (BKF); Chiang Mai, Doi Inthanon, Phengklai et al. 1029 (BKF), Shigeyuki et al. 45322 (BKF); Chaiphum, Smitinand 11857 (BKF). **Bangladesh:** Griffith 2923, 2925, 2924 (K, P). India: Naga hill, Meebold 7421; Khasia, Clarke 15241, 1785, 43722.

*L. inodorus* Bl. from the mountains of Java is clearly conspecific with *L. poilanei* Pitard of Cambodia and *L. tubiferus* Hook. f. from India, Thailand and Yunnan of China. The species has orbicular coriaceous bracts which make difference from other species of the genus.

The distributional pattern of Himalaya-Mainland SE Asia-Java exists also in the species *L. lucidus* Bl. (Zhu, 1995) as well as many other taxa of seed plants, as pointed out by Wu et Wang (1983) and Wu (1991).

*L. inodorus* Bl. was cited in Masamune's Check-list of Bornean Plants (Masamune, 1942). I have seen the specimens from Borneo in K, which are determined as *L. inodorus* Bl., but they do not agree with the type de-

scription of *L. inodorus* Bl.

**Lasianthus kurzii** Hook. f., Fl. Brit. India. 3: 183 (1880); Pitard in Lecomte, Fl. Gen. Indo- Chine 3: 384 (1924); Craib, Fl. Siam. 2 (1): 212 (1934); Deb et Gang. in J. Econ. Taxon. Bot. 15 (2): 288 (1991); Zhu in Acta Phytotax. Sin. 32 (1): 60 (1994). Type: Burma, Chopedang, *Wall. Cat.* 8310 (K). — *L. stercorarius* sensu Kurz, Forest Fl. Burma 2: 31 (1877), non Bl. (1826). — *L. hoensis* Pierre ex Pitard in Lecomte, Fl. Gen. Indo- Chine 3: 383 (1924). syn. nov. Syntypes: Cochinchina, Bien Hoa, Tri- huyen, *Pierre* 1316 (P and Iso- syntype E, BM, K); Bien Hoa, Gia- ray, *Poilane* 40832 (P and Iso- syntype BM); Cambodia: Mt. Camchay, Kampot, *Pierre* 3267 (P). — *L. kurzii* Hook. f. var. *howii* H. S. Lo in Bot. J. S. China 1993: 2 (1993). syn. nov. Type: China, Yunnan, Mengla, Wang 80524 (SCBI)

a. var. **kurzii**

Distribution.: China (S Yunnan), India, Burma, Thailand, Laos, Cambodia, Vietnam and Indonesia (Java).

Additional specimens: **Burma:** Myitky na, *Belcher* 641; *Tenasserim*, *Keenan* 855, 884 (K, E). India: Assam, Naga Hills, *Meebold* 6151. **Thailand:** Trat, *Geesink* 6494; Kaokata, *Kerr* 18402 (K, E); Chiang Mai, *Kerr* 17404, *Murata et al.* 15742 (BKF), *Maxell* 87- 710 (BKF), *Maxell* 87- 3040 (BKF); Loei, *Murata* 42858 (BKF); Nakhon Ratchasima, *Beusekom et al.* 3272 (BKF); Trat, *Murata et al.* 17596 (BKF); Krabi, *Larsen et al.* 4331 (BKF); Peninsular, Pangnga, *Geesink* 5035, 7374; *Maxwell* 90- 564; Ranong, *Puff et Sridith* 930706111 (PSU). (E). Vietnam: Cochinchina, Bien Hao, *Poilane* 832 (BM); S. Annam, *Boden Kloss* s. n. (K). Cambodia: Koh Kong (500 m alt.), *Martin Mane* 1541 (P), 417 (P). Laos: Nape, *Spire* 89 (P). Indonesia: Java: Tjigalin, *Zollinger* 594 (P), s. n. (P), Koorders. 39248.

b. var. **microphyllus** (Pitard) H. Zhu, comb. nov. — *L. hoensis* Pierre ex Pitard var. *microphyllus* Pitard in Lecomte, Fl. Gen. Indo- Chine 3: 383 (1924). Type: Cambodia, Mt. Elephant, *Poilane* 233 (P and Isotype E, K).

Distribution: Cambodia.

c. var. **sylicola** H. S. Lo in Bot. Journ. South China 1993: 3. 1993.

Type: China, Hainan, E. Hainan Expedit. 530 (SCBI). — *L. kurzii* Hook. f. var. *fulvus* C. Y. Wu et H. Zhu, H. Zhu in Acta Phytotaxon. Sinica 32 (1): 60. 1994. syn. nov. Type: China, Yunnan, Xishuangbanna, Yunnan- expedit. 59- 13346 (KUN).

Distribution: China (Yunnan, Hainan); New to Thailand.

Additional specimens: **China:** Hainan, *vegetation Exp.* 820 (SCBI). Thailand: Chiang Mai (850 m), *Phengklai et al.* 6782 (BKF); Nakhon Ratchasima, *Beusekom et Charoenpal* 1822 (E); Chaiphaphum (600 m. alt.), *Beusekom et al.* 4452 (P, BKF); Trat, *Murata et al.* 17419 (BKF); Khao Yai, *Murata et al.* 16252 (BKF); Prachinburi, *Larsen et al.* 340 (BKF).

**Lasianthus lucidus** Bl., Bijdr.: 997 (1826); Miq., Fl. Ind. Bat. 2: 319 (1857); Kurz, Forest Fl. Burma 2: 30 (1877); Hook. f., Fl. Brit. India. 3: 184 (1880); Pitard in Lecomte, Fl. Gen. Indo- Chine 3: 385 (1924); Craib, Fl. Siam. 2 (1): 214 (1934); Bakh. f. in Backer & Bakh. f., Fl. Java 2: 324 (1965); Deb et Gang. in J. Econ. Taxon. Bot. 15 (2): 290, fig. 6 (1991), exclud. var. *caudisepalus* Deb et Gang; Zhu in Acta Phytotax. Sin. 32 (1): 63 (1994). Typus non vidi. — *Mephitidia lucida* (Bl.) DC., Prodr. 4: 453 (1830).

a. var. **lucidus**

Distribution: China (Yunnan, Hainan), Indonesia (Java, Sulawesi), Philippine, Malay penin., Thailand, N. Vietnam, Burma and NE India.

Additional specimens: **China:** Hainan, 1600 m alt., *Fu Guo- ai* 7474 (SCBI); 1360 m alt. S. H. Chun 10783 (SCBI). Yunnan: Meng Lian, 1450 m alt. *G. D. Tao et al.* 39666 (HITBC); E-shan, 1680 m alt. *E-shan exp.* 577 (KUN); Luchun, 2300 m alt., *G. D. Tao* 839, 319 (KUN). **Indonesia:** Java Salak Mt., *Koorders* 36715B; Jibodas, *Fosberg* 44589; *Steenis* 12440; Collector unknow s. n. (1400 m. alt.) (P). Philippine: Mt. Isarog, Camarines, *Ramos* 22064. Luzon, Tayabas, *Elmer* 9152 (E). Thailand: Krat, *Kerr* 18722; Doi Angakette, *Hosseus* 353. Ching-mai (1950m alt.), *Maxwell* 90- 418 (E), Ching-mai (1700 m alt.), *H. N.* 1108 (BKF), *Murata et al.* 15294 (BKF). **Vietnam:** Tonkin, Ninh-binh, Bon 4214 and s. n. (P). **India:** Assam, *Cox et Hutchison* 392 (K, E); Khasia, *Clare* 42484A, 42484B; Naga hill, Meebold 7201.

*L. lucidus* Bl. var. *caudisepalus* Deb et Gang., a taxon restricted to Arunachal, Pradesh and Meghalaya, which has short peduncles and triangular teeth of calyx shorter than the tube of calyx, in the author's opinion, should be excluded from *L. lucidus* Bl.

b. var. **inconspicuus** (Hook. f.) H. Zhu, comb. et stat. nov. — *L. inconspicuus* Hook. f., Fl. Brit. India. 3: 187 (1880); Hutch. in Sarg. Pl. Wilson. 3: 402 (1916), exclud. var. *hirtus* Hutch. Type: Bangladesh, Silhet, *Wall. Cat.* 8313 (K)

Distribution: NE India, Bangladesh.

Additional specimens: **China,** Yunnan, *Henry* 12608, 12608A (K). **Bangladesh:** *Griffith* 2929 (P). **Thailand:** Chiang Mai, Doi Inthanon, 900- 1800 m alt., *Murata et al.* 15785 (BKF).

*L. lucidus* Bl. is a montane species which always occurs at alt. 1200 m and above. It is very similar to *L. inconspicuus* Hook. f. from Northeast India. The distinction between the two species is confusing. According to the original description, *L. lucidus* Bl. has relatively small and ovate leaves with 3~ 5 pairs of nerves and the calyx lobes which are longer than the tube; while the type of *L. inconspicuus* Hook. f. has relatively large leaves and the calyx lobes shorter than tube. However, the delimitation between them becomes ambiguous in Yunnan, China. It is considered better to reduce *L. inconspicuus* Hook. f. to a variety of *L. lucidus* Bl.

**Lasianthus rhinocerotis** Bl., Bijdr.: 996 (1826); Ridley, Fl. Malay Penins. 2: 154 (1923); Bakh. f. in Backer et Bakh., Fl. Java 2: 338 (1965). Typus non vidi. a. subsp. **rhinocerotis**

Distribution: Malaysia (Peninsula and Borneo), Indonesia (Java, Sumatra).

Additional specimens: **Malay peninsula:** Pahang, T. & P. 992; *Shimizu et al.* 13352; *Univ. Mal.* no. 8090. **Indonesia:** **Java:** *Horsfield Rub.* 48 (K) (Miq., 1857); **Sumatra:** Atjeh, *Wilde et al.* 14760; Padang, *Beccari* 409, 165; *Ridley* s. n. (K); Asahan (E Coast), *Rahmat Si Boeea* 10729 (K).

b. subsp. **pedunculatus** (Pitard) H. Zhu, stat. nov. Type: Vietnam: Tonkin, Dong-dang, Balansa 638 (P). — *Mephitidia* sp. Drake in Morot, J. de Bot. 9: 240 (1895). — *Lasianthus rhinocerotis* Bl. var. *pedunculata* Pitard in Lecomte, Fl. Gen. Indo-Chine, 3: 395 (1924); Zhu in Acta Phytotax. Sin. 32 (1): 73 (1994). — *Lasianthus koi* Merr. et Chun in Sunyatsenia. 2 (1): 47. 1934. Type: China, Hainan, *S. P. Ko* 52243 (Holo. SCBI, and Iso. K).

Distribution: China (Guangxi, Hainan, Yunnan) and North Vietnam.

Additional specimens: China, Hainan, *Liang* 65280. Yunnan: Xi-chou, *C. W. Wang* 86022 (KUN).

*L. rhinocerotis* Bl. subsp. *pedunculatus* (Pitard) H. Zhu differs from the typical subspecies in having rela-

tively larger oblong leaves with 8~9 pairs of nerves, more conspicuous peduncles and thicker linear bracts. As the geographical ranges are disjunctive, it is more reasonable to recognise *L. rhinocerotis* Bl. var. *pedunculata* Pitard as a geographical subspecies.

***Lasianthus sikkimensis*** Hook. f., Fl. Brit. India. 3: 180 (1880); Deb et Gang. in J. Econ. Taxon. Bot. 15 (2): 297 (1991); H. Zhu in Acta Phytotax. Sin. 32 (1): 60 (1994). Type: Sikkim—Himalaya, *J. D. Hook. et T. Thomson* no. 11 (K). — *L. baviensis* (Drake) Pitard in Lecomte, Fl. Gen. Indo-Chine 3: 380 (1924). syn. nov. Type: Vietnam, Tonkin, Tu-phap, *Balansa* 2655 (Holo. P, Iso. K).

a. subsp. **sikkimensis**

Distribution: China (S Yunnan, SW Guangxi), N Vietnam, NE India, Sikkim and Bangladesh.

Additional specimens: **China:** Xizang, Moto, *H. Sun et al* ETM-1766, 1286, 1538 (KUN). **India:** Khasia, *Clarke* 44465A; Assam, *Watt* 11915 (E).

b. subsp. **langkokensis** (Pitard) H. Zhu in Acta Phytotax. Sin. 32 (1): 61 (1994). Type: Vietnam, Tonkin, Bavi, *Balansa* 2654 (Holo., P). — *L. langkokensis* Drake ex Pitard in Lecomte, Fl. Gen. Indo-Chine 3: 379 (1924). — *L. tsangii* Merr. ex Li in J. Arnold Arbor. 24: 458 (1943); Icon. Corm. Sin. 4: 756 in clavi. (1975). Type: China, Kwangsi, *W. T. Tsang* 23940 (SCBI)

Distribution: China (Yunnan, Guangxi, Guangdong, Hainan, Hunan) and N. Vietnam.

Additional specimens: China: Guangdong, Dinghu Mt., *Shi Guo-liang et al.* 2483 (SCBI); Hainan, *Z. X. Lee et al.* 3247 (SCBI).

*L. sikkimensis* Hook. f. can be distinguished from *L. langkokensis* Pitard by its relatively smaller lanceolate leaves, thinner indumentum and usually relatively narrower and smaller bracts. In southeast Yunnan and southwest Guangxi provinces of China, the distinction between them becomes ambiguous. However, because of distinct ranges, it is better to reduce them to geographical subspecies.

***Lasianthus tomentosus*** Bl., Bijdr.: 97. 1826; Ridley, Fl. Mal. Penins. 2: 161 (1923); Craib, Fl. Siam. 2 (2): 219 (1934); Backer et Bakhuizen, Fl. Java 2: 343 (1965). Typus non vidi. — *Lasianthus lei* Merr. et Metc. ex H. S. Lo in Bot. J. S. China 1993: 12 (1993). syn. nov. Type: China, Hainan, *C. I. Lei* 1025 (Holo. SCBI, Iso. K, P, SYS) — *L. cupreus* sensu Pitard in Lecomte, Fl. Gen. Indo-Chine 3: 392, pro parte, quoad specimen *Gaudichaud* 229 which was cited by Pitard as *L. cupreus* Pierre ex Pitard. It does not agree with the description of *L. cupreus* Pierre in having dense brown pubescence on branches and leaves beneath, but agrees with *L. tomentosus* Bl. instead.

a. var. **tomentosus**

Distribution: China (Hainan), Thailand, Vietnam, Malay penin., Singapore and Indonesia (Java, Sumatra).

Additional specimens: **China,** Hainan, *H. Y. Liang* 66054 (KUN), 64966 (KUN), *S. H. Chun* 11229 (KUN), 11439 (KUN), *Hainan exp.* 520 (KUN), *Wang* 32953, 34959, *Tso et al.* 44628, *Lau* 2885 (P), *Z. X. Lee* 2935 (SCBI), 4116 (SCBI), 4834 (SCBI), *H. Y. Liang* 64305 (SCBI). **Vietnam:** Cochichina, *Gaudichaud* 229 (P). **Thailand:** Chunmpan, *Kerr* 11605; *Larsen* 9157 (BKF). **Singapore:** *Ridley* 1647. **Indonesia:** Java: *T. Horsfield* 50; West Java, Tjibodas, *Kds.* no. 32018B.

Although the type specimen of *L. lei* Merr. et Metc. ex H. S. Lo is a little different from the specimens of *L. tomentosus* Bl. from type place Java in having less pubescence on branches and leaves beneath, the original de-

scription and most specimens cited by S. H. Lo agree well with *L. tomentosus* Bl. The species *L. lei* Merr. et Metc. ex H. S. Lo can not be actually distinguished from *L. tomentosus* Bl.

b. var. **hüranensis** (Hay.) H. Zhu, stat. et comb. nov.

Type: Taiwan, Hayata et Sasaki 24295 (TIU), non vidi. — *Lasianthus hüranensis* Hay., Icon. Pl. Formos. 9: 62. 1919; Simizu in Trans. Nat. Hist. Formos. 34: 239. 1944; Matsum., List Vasc. Pl. Taiwan: 118. 1954; Liu et Chao in Taiwania 10: 134. fig. 9. 1964; Chao in Fl. Taiwan 4: 295, pl. 1010. 1978; H. Zhu in Acta Phytotax. Sin. 32 (1): 70. 1994.

Distribution: China (Taiwan), Philippines.

Additional specimen: Philippines: Mindora, Puerta Galera, Merrill 3325 (K).

*L. hüranensis* Hay. differs from *L. tomentosus* Bl. in having only a little less pubesce on branches and leaves beneath, and villous inside corolla. It is better to reduce *L. hüranensis* Hay. to a variety of *L. tomentosus* Bl.

Liu et Chao (1964) mentioned that *L. hüranensis* Hay. occurred also in Malay peninsular and Java. Liu and Chao probably confused *L. tomentosus* Bl. of Malay peninsular and Java with *L. hüranensis* Hay. The author checked only a few sheets from Malay and Java, so whether *L. hüranensis* Hay. occurred also in Malay and Java has not been determined yet.

***Lasianthus verticillatus*** (Lour.) Merr. in Trans. Amer. Philos. Soc. new series 24: 372 (1935); H. Zhu in Acta Phytotax. Sin. 32 (1): 68 (1994). Type: Cochinchina, Dausus G. 48 (BM). — *Daus verticillatus* Lour., Fl. Cochinch.: 142 (1790); Moore in J. Bot. Brit. Foreign. 63: 250 (1925). — *Lasianthus andamanicus* Hook. f., Fl. Brit. India. 3: 189 (1880), exclud. var. *ciliatus* Deb et Gang. Type: Burma, Andaman, Wall. Cat. 8309 (Iso., K). — *Lasianthus obliquinervis* Merr. in Philipp. J. Sci. 1: suppl.: 136 (1907). Syntype: Philippine, Whitford 247 (Isosyn. P). — *Lasianthus chinensis* sensu Maxim. in Bull. Imp. Acad. Sci. St Petersburg. 29: 173 (1883) non Benth. (1861); Henry, List Pl. Formos.: 51 (1896); Matsum. in Bot. Mag. (Tokyo) 15: 16 (1901); Hay., Icon. Pl. Formos. 2: 98 (1906); Pitard in Lecomte, Fl. Gen. Indo-Chine 3: 391 (1924); Li, Wood. Fl. Taiwan: 855 (1963) pro parte; Chao in Fl. Taiwan 4: 286 (1978) pro parte quoad pl. 1005. — *Mephitidia chinensis* sensu Nakai, Trees et Shrubs Jap. ed. 1: 382 (1922) non Champ. — *Lasianthus nigrocarpus* Masam. in Trans. Nat. Hist. Soc. Formos. 22: 222 (1932), nom. nud. — *Lasianthus trichophlebus* auct.: Fl. Hainan 3: 336 (1974); Icon. Corm. Sin. 4: 247, fig. 5907 (1975) non Hemsl. (1888). — *L. tamirensis* Pierre ex Pitard in Lecomte, Fl. Gen. Indo-Chine 3: 390 (1924). syn nov. Type: Cambodia, Samrong-tong, Mt. Tamire, Pierre 587 (P), Isotype (K).

a. var. **verticillatus**

Distribution: China (Yunnan, Guangxi, Hainan, Guangdong, Taiwan), Japan (Ryukyu), Philippine, Indonesia (Java, Sumatra), Thailand, Vietnam, Laos, Cambodia, Burma, India (Andaman and Nicobar).

Additional specimens: **China:** Taiwan: Price 387, 716; Faurie 263 (BM), 246 (BM), 251 (BM), 242 (BM); Oldham 218 (BM), s. n. (BM); Wilson 11111; Suzuki 4491; Tanaka 1757, 11124 (E); Keng et Kao 2683 (E); Taipei, Boufford et al 24960 (KUN). Hongkong: Leveil 673 (E). Guangdong: Lofu Mt., F. C. Hou 74040 (SCBI), X. P. Kao 52444 (SCBI), X. Z. Wang 90 (SCBI). **Japan:** Ryukyu, Furuse 2987, 856, 4667, 2910, 2845, 3640, 2875, 3379. **Philippine:** Mindanao, Elmer 14007 (K, E); Luzon, Elmer 14908, 16522 (K, P); Banajao, Robinson s. n. (Bureau Sci. no. 6571) (P); Tayabas, Ramos 13323; Bataan, Whitford 247 (P); Rizal, San Andales, Edano s. n. (Bureau Sci. no. 48702) (P); Pampanga, Mt.

Pinatubo, *Elmer* 21967 (P). **Indonesia:** Java, *Zollinger* 594? (P). Sumatra, *Enggano*, *Lutjeharms* 4109 (P). **India:** Andaman, *Kurz* s. n., *King* s. n., *Par Reroa* 459. Burma: Tenasserim, *Kurz* 21591. **Thailand:** Loei, *Beusek* 7550, *Lekagul* 82 (BKF); Rayawng, *Put* 2704; Ban Dan, *Kerr* 4133; Penin., *Charoenphel* 4095 (K, E); Chaiyaphun, *Geesink* 6877; Nakhon Ratchasima, *Beusek* 1881; Chiang Mai, *Geesink* 5695, *Put* 2740 (E); Chulaphorn Dom, *Larsen* 31454, *Kerr* 4133; *Beusekom et al.* 4116 (P); Trat, *Phengnaren* s. n. (BKF); Kanchanaburi, *Larsen et al.* 33863 (BKF). **Vietnam:** Tonkin, *Bon* 6107; Cochinchina, *Thorel* 1175 (K, P), *Harmand* 187 (K, E), 770 (P); Hue, *Squire* 233; Tourane, *Clemens* 3600; Annam, Nha-trang, *Robinson* 1394 et 1294 (P), Thuathien, *Eberhardt* 2864 (P). **Cambodia:** Chua-chuang, *Pierre* 6172 (P); *Pierre* 587; Chevalier 31817 (P); Sum Roap, *Martin* 492 (P).

This species was often confused with *L. chinensis* Benth. It differs from the latter in having thinner or sparse appressed-pubescent on branches and leaf nerves beneath, coriaceous leaves with 5~9 pairs of nerves and parallel veinlets, cupulate and usually truncate calyx without teeth or sometime with minute teeth, as well as the fruits not angular. According to Bentham's original description of *L. chinensis*, it has leaves with parallel veinlets, but the type specimen shows almost reticulate veinlets. This may be a factor leading to confusion.

*L. verticillatus* from Southwest China and Indochina is undoubtedly conspecific with *L. andamanicus* Hook. f. and with *L. tamirensis* Pierre ex Pitard from Cambodia. *L. obliquinervis* Merr. from southeast China, Ryukyu and Philippine has the calyx varying from truncate to minute-toothed, of which specimens with a truncate calyx exactly agree with *L. verticillatus*. As the variance of calyx from the truncate to the minute-toothed is continuously without clear disjunction, *L. obliquinervis* Merr. can not be distinguished clearly from *L. verticillatus* (Lour.) Merr.

b. var. **taitoensis** (Simizu) H. Zhu in Acta Phytotax. Sin. 32 (1): 69 (1994).

Type: Taiwan, *T. Suzuki et Fukuyama* s. n. (TIU), non vidi. — *Lasianthus taitoensis* Simizu in Trans. Nat. Hist. Soc. Formos. 34: 239 (1944). — *Lasianthus obliquinervis* Merr. var. *taitoensis* (Simizu) Liu et Chao in Taiwan. 10: 145, f. 15 (1964). — *Lasianthus truncatus* Bedd., Icon. Pl. Ind. Or. 1: 2, t. 9 (1874); Hook. f., Fl. Brit. India. 3: 189 (1880); Deb et Gang. in J. Econ. Taxon. Bot. 15 (2): 302, f. 13 (1991). syn. nov. Type: India: Mahendra Hill, *Beddome* s. n. (Lecto., K).

Distribution: China (Taiwan), India, Malay Penin., Burma, Thailand, Indonesia (Sumatra) and Philippine.

Additional specimens: **China:** Taiwan, *Yeh* 793. **Burma:** Tenasserim, *Helper* 2933. **Thailand:** *Collins* 407, 844; Korat, *Kerr* 2145; Chonburi, *Phengnaren* 212 (BKF). **Malay penin.:** Langkau, *Robinson* 6292. **Indonesia:** Sumatra: *Teysmanna* s. n. **Philippine:** Luzon, Bontoc, *Ramos et Edano* s. n. (Bureau Sci. no. 38061) (P). **India:** Bihar, *Haines* 651; *Vizagakanan*, *Luihiugt.* 42, s. n.; Salem, *Matthew* 28243

This variety differs from typical variety in having relatively small, lanceolate, 7~21 cm long and 1.5~3.5 cm wide leaves.

**Lasianthus wallichii** (Wight & Arn.) Wight in Calc. Nat. Hist. 6: 503. 1846; Hook. f. Fl. Brit. Ind. 3: 180. 1880 (excl. var.? *penangensis* Hook. f.); Matsum. in Bot. Mag. Tokyo 15: 16. 1901; Prain, Beng. Pl. 1: 576. 1903; Pitard in Lecomte, Fl. Gen. Indochina 3: 387. 1924; Craib, Fl. Siam. Enum. 2 (1): 220. 1932; Fl. Hainan 3: 335, fig. 753. 1974; Iconogr. Corm. Sin. 4: 250, fig. 5914. 1975; Hara et Gould in Hara et Will., Enum. Fl. Pl. Nepal 2: 204. 1979; C. Y. Wu, Index Fl. Yunnan. 2: 1259. 1984; H. Li in C. Y. Wu, Fl. Xizang. 4: 449, pl. 192, f. 1~4. 1985; Deb et Gangopadhyay in J. Econ. Tax. Bot. 15

(2): 307. 1991; H. Zhu in Acta Phytotaxon. Sinica 32 (1): 56. 1994. Type: India, Silhet, De Silva s. n. ex Wall. Cat. 8442 (K). — *Nonatelia? hispida* Wall. in Roxb., Fl. Ind. 2: 187. 1824. non eut *Lasianthus hispidus* Elmer, Leaflets Philipp. Bot. i.: 10 (1906). — *Mephitidia wallichii* Wight et Arn., Prodr. 1: 390. 1834, in nota. — *L. plagiophyllus* Hance in Journ. Bot. New Ser. 4: 196. 1875; Liu et Chao in Taiwan 10: 147, fig. 16. 1964; Chao in Fl. Taiwan 4: 303, pl. 1015. 1978. Type: China, Hongkong, Herb. Hance 18438. (BM) (Isotype, K) — *L. bordenii* Elmer, Leaf. Philip. Bot. 1: 11. 1906 Type: E. Elmer 6977 (Isotype, E) — *L. tonkinensis* (Drake) Pitard in Lecomte, Fl. Gen. Indochine 3: 376. 1924. Type: Tonkin: Bavi, Balansa 2656 (P), Isotype (K). — *L. wallichii* (Wight & Arn.) Wight subsp. *plagiophyllus* (Hance) C. Y. Wu et H. Zhu, Zhu in Acta Phytotax. Sin. 32 (1): 57. 1994. — *Mephitidia tonkinensis* Drake in Morot, J. de Bot. 9: 240. 1895. — *Mephitidia plagiophylla* (Hance) Nakai, Tree et Shrubs Jap. rev. ed.: 529. 1927.

a. var. **wallichii**

Distribution: China (Yunnan, Guangxi, Guangdong, Hainan, Fujian and Taiwan); S. Japan; Philippine; Indochina; Thailand; Burma; NE India; Nepal; Bhutan.

Additional specimens: **China:** Taiwan, Oldham 299, 223 (BM); W. R. Price 1117, 1446, C. E. Chang 2476, T. Y. Liu et Y. Shimada et al 11123 (E); Faurie 252, 241 (BM); Taipei, Boufford et al 24964 (KUN) **Japan:** Ito, Murata s. n. Ryukyu: Furuse 1917, 4321, 3868, 4468, 4013, 1513, 13465, 1818, 1767, 1428, 1226, 10438; Nakaike 633 (Okinawa) (K, BM), Murata 17031; Yamazaki 19115. Philippine: Luzon, Pampanga, E. Elmer 22097; Luzon, Bataan, J. E. Borden 2088 (E). Thailand: Peninsular, Larsen 3581 (E), S. Pheng 503; Korat, Kerr 9845, Salut, Kerr 15739; Sritamarat Kerr 15466; N. Rachasima C. Pheng. 497; Khao Chong, Charoenphol et al. 3709 (P). **Vietnam:** Cochinchina, Condor, Harmand s. n. (P); Bien-hoa, Pierre 1341 (P); Ninh thai, Bon 4071 (P), 4219 (P); Annam, Quang-tri Eberhardt 2019 (P). **Cambodia:** Thepong, Pierre 1341 (P). **India:** Khasia, Keenan 495; Upper Assam, Cachar, Keenan s. n. **Burma:** Tenasserim, Tavoy, Keenan et al. 1520 (E), 1199 (E).

b. var. **setosus** (Craib) C. Y. Wu et H. Zhu, H. Zhu in Acta Phytotaxon. Sin. 32 (1): 57. 1994. Type: Thailand, Rancury, Kerr 11827 (K) (Isotype, BM). — *L. setosus* Craib in Kew Bull. 1933: 26. 1933; et Fl. Siam. Enum. 2 (1): 217. 1934. — *L. thorelii* Pitard in Lecomte, Fl. Gen. Indochine 3: 389. 1924. syn nov. Type: Laos, Penongs, Thorel 2161 (P)

Distribution.: China (S Yunnan); Laos; Thailand.

Additional specimens: Laos: Wiengchan, Kerr 21211. Thailand: Tung Salaeng Luang, Larsen 808, Hansen et al. 11088 (K), Tagawa et al. 2112 (BKF), 11790 (BKF); Chiang Mai, Schumacher 722 (BKF).

This variety differs from var. *wallichii* in having stiff hairy on branches and sometime on leaves too.

c. var. **hispidocostatus** H. Zhu, var. nov. — *Lasianthus wallichii* sensu Kurz: For. Brit. Burma 2: 31. 1877. non Wight. Holotype: China, Yunnan, Szemao, S. E. forest, 4000 ft. Henry 12789 (K)

A typo foliis basi rotundatibus, ad costam supra tomentosis differt.

Distribution: China (S Yunnan, SE Xizang); Nepal; Bhutan; NE India; Bangladesh; Burma.

Additional specimens: **China:** Yunnan, Henry 12789a (E, K); Xizang, Moto, H. Sun et al ETM-1494, 2148, 2214 (KUN). **India:** Naga hills, Meebold 7462; Khasia, Hook. f. et T. T. s. n. (K); **Bangladesh:** Chittagong, J. S. Gamble 7910. Burma: Supra Bum, Kingdon-Ward 20391; Nam Tamai, Kingdon-Ward 9150; Kalay Hills, Prazer 89 (E). **Nepal:** Chainpur (5000ft.) Stainton 442 (E)

This variety differs from the typical variety in having leaves which are almost non-oblique at base and hairy

on mid rib above.

J. D. Hooker (1880) reduced *L. plagiophyllus* Hance to a synonym of *L. wallichii* Wight. The type of *L. wallichii* is almost identical to the type of *L. plagiophyllus*. However, some specimen from Burma, NE India and Yunnan of China are different from the ones from Ryukyu, S Japan, Philippine and SE China in leaf appearance. The western ones have relatively larger oblong leaves with slightly cordate and slightly oblique bases, while the eastern ones have relatively small ovate-oblong leaves with obviously cordate and oblique bases. Further comparison may reveal that the Hengduan Mountain ranges between Burma and Thailand seem as a geographical demarcation.

**Lasianthus wardii** Fischer et Kaul in Kew Bull. Misc. Inform. 1940: 292 (1940). Type: Burma: Nam Tamai, F. K. Ward 6679 (K) Distribution: Burma, China (Yunnan) (new to China).

**China:** Yunnan: Forrest 11878 (K, E). **Burma:** Myitkina, Tha H. 3781.

**ACKNOWLEDGMENTS** I thank the Herbaria of Royal Botanic Gardens, Kew, the Botany Department of the British Natural History Museum, the Royal Botanic Garden Edinburgh and the Laboratoire de Phanerogamie, Museum National d'Histoire Naturelle, Paris for conveniences of referencing specimens. I also wish to thank Prof. C. Y. Wu and Prof. H. Li who have worked on the genus *Lasianthus* of China for many years, which offers good bases for my research. I thank Dr. D. Z. Li and my other colleagues who have helped me a lot in writing up the paper. I particularly thank Ms. D. Bridson for her great help during my research.

## REFERENCES

- Deb D B, Gangopadhaya M, 1989. Review of the genus *Litosanthes* Bl. (Rubiaceae). *Candollea*, **44**: 209~ 223
- Deb D B, Gangopadhaya M, 1991. Taxonomic study of the genus *Lasianthus* Jack (Rubiaceae) in India. *J Econ Tax Bot*, **15** (2): 265~ 308
- Ferguson D K in Lauener, L A, 1972. Catalogue of the names published by Hector Leveille: VIII. *Notes Royal Bot Gard Edinb*, **32** (1): 109
- Liu T S, Chao J M, 1964. Revision of the Taiwan species of *Lasianthus* (Rubiaceae). *Taiwania*, **10**: 117~ 147
- Masamune G, 1942. Enumeratio Phanerogamarum Bornearum: 690
- Rehder A, 1935. Notes on the *Ligneous* plants described by Leveille from Eastern Asia. *J Arnold Arbor*, **16**: 323
- Robbrecht E, 1988. Tropical woody Rubiaceae. *Opera Bot Belgica* 1: 132. Wong K M, 1989. Tree Fl. *Malayam*, **4**: 367~ 373
- Wu Z Y, Wang H S, 1983. The Chinese Physical Geography- Plant Geography (Part I). Beijing: Science Press, 104~ 125
- Wu Z Y, 1991. The areal- types of Chinese genera of seed plants. *Acta Bot Yunnan*, **Supple IV**: 7~ 13
- Zhu H, 1994. A taxonomic study on the genus *Lasianthus* Jack in China. *Acta Phytotax Sin*, **32** (1): 49~ 81
- Zhu H, 1995. A phytogeographical study on the genus *Lasianthus* Jack in China. *Guihaia*, **15** (4): 307~ 318