**Calamagrostis hongii** (Poaceae, Agrostidinae), a new species from southwestern China

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**Abstract**

*Calamagrostis hongii*, a new species of *Calamagrostis* (Poaceae) from southwestern China (S Chongqing, W Guizhou, Sichuan, SE Xizang, Yunnan), is here described and illustrated. It is similar to *C. arundinacea* and *C. effusiflora* in spikelet traits, but can be distinguished by its moderately or densely scabrous upper leaf surface with ribs covered by short, stiff, prickle hairs, and glabrous leaf sheaths, blades and collars. Nomenclature *Deyeuxia zhongdianensis* lacks Latin description or diagnosis and is an unavailable *nomen nudum* (naked name).

**Keywords**

Asia, *Deyeuxia*, distribution, endemism, Flora of China, Sino-Himalayan region, taxonomy

**Introduction**

Six species of *Calamagrostis* Adans. and thirty four species of *Deyeuxia* Beauv. were reported in the published taxonomic treatments for the “Flora of China” (Lu and Phillips 2006; Lu et al. 2006). Among them, 15 species of *Deyeuxia* and one species of *Calamagrostis* were considered to be endemic to China (Lu and Phillips 2006; Lu et al. 2006; Huang et al. 2011, 2017). Twelve of these endemics occur in the mountains of SW China, which are recognized as a global biodiversity hotspot (Boufford 2014; Cai et al. 2019) and this region continues to produce species of grass new to science. Re-
cent examples include one new species of *Achnatherum* Beauv., two new species of *Deyeuxia*, two new species of *Ptilagrostis* Griseb. and two new species of *Stipa* L. (Paszko and Chen 2013; Paszko and Pendry 2013; Nobis et al. 2016; Zhang et al. 2016, 2017, 2018; Zhao and Guo 2017; Cai et al. 2019).

At present, a taxonomic revision of *Calamagrostis* (including Asian species of *Deyeuxia*) for China is being prepared by the second author (Paszko 2019). Following recent molecular studies, all Asian species of *Deyeuxia* have been placed in the genus *Calamagrostis* (Saarela et al. 2010, 2017; Paszko et al. 2017). To date, a great number of major changes have been made within the classification of the genus *Calamagrostis* in China since 2006. These changes cover new species, taxonomic novelties and range extensions of several species. There is a considerable increment in the number of species. Thus, the total number of species described and reported from China increased from 40 up to 47. The subsequent major changes are summarized in more detail herein. To date, two species (*C. sorengii* (Paszko & WL Chen) Paszko and *C. gaoligongensis* (Paszko) Paszko) new to science have been described (Paszko and Chen 2013; Paszko and Pendry 2013), a third one is described here (*C. hongii* Paszko & Bing Liu). *Calamagrostis altaica* Tzvelev, described from China and overlooked in the “Flora of China”, was shown to be a separate species (Paszko et al. 2016a). Two names, *Calamagrostis kengii* T. F. Wang and *Deyeuxia flavens* Keng, have been considered synonymous with taxa that occur beyond China (Paszko 2012; Paszko and Ma 2011).

In addition, several major range extensions to China and beyond turn up. Two new records for China (*C. filiformis* Hooker f., *C. garhwalensis* Hubbard & Bor) have been reported (Paszko 2012, 2014b) and Tzvelev’s (1968) records of *C. salina* Tzvelev, neglected in the “Flora of China”, have been confirmed from China (Paszko et al. 2016b). Three species, *Calamagrostis effusiflora* (Rendle) J.L. Yang, *C. diffusa* (Keng) Keng f. and *C. himalaica* (Liou ex W.L. Chen, emend. Paszko) Paszko, can no longer be recognized as endemic to China because they have been documented in at least one additional country (Paszko and Soreng 2013; Paszko 2014a, 2015, 2016, 2019; Paszko and Chen 2013; Paszko and Pendry 2013; Paszko and Soreng 2013; Paszko et al. 2013; Paszko in Nobis et al. 2014a; Paszko in Nobis et al. 2014b; Paszko et al. 2017; Paszko and Liu 2018).

In the course of the review of specimens of *Deyeuxia* in three Chinese Herbaria (CDBI, KUN, PE), numerous specimens formerly undetermined or identified as *Deyeuxia pyramidalis* (Host) Veldk. caught the second author’s attention. Most of
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these specimens were collected in Yunnan, Sichuan and SE Xizang, with a few in adjacent Chinese provinces. For comparison, Calamagrostis effusiflora and Eurasian C. arundinacea (L.) Roth (in the “Flora of China” as Deyeuxia pyramidalis (Host) Veldk.) that show similarity in habit and spikelet traits, were also examined. We concluded that these plants represent an undescribed species new to science and we describe it here as Calamagrostis hongii Paszko & Bing Liu.

Materials and methods

We employed standard techniques for morphological studies of herbarium specimens from the CDBI, KUN, PE, US and W (acronyms follow Thiers 2017). All measurements were taken from the best-developed spikelets and leaf characteristics were determined on the 2nd leaf from the top of the plants. The locality data in accounts below inferred from sources other than herbarium labels are placed in square brackets. The localities were sorted according to the county-level administrative division of the People's Republic of China. The distribution map was created with SimpleMappr (Shorthouse 2010) (Fig. 1). Specimens with the barcode numbers are accessible online via the PE Herbarium (http://pe.ibcas.ac.cn/en/), the National Plant Specimen Resource Center (http://www.cvh.ac.cn/), or the Muséum National d’Histoire Naturelle (https://science.mnhn.fr/institution/mnhn/collection/p/item/search). The data underpinning the analyses reported in this paper are deposited at GBIF, the Global Biodiversity Information Facility, https://www.gbif.org/dataset/c6dd8791-eaae-49f5-9c18-b4bc06a7357f.

Taxonomic treatment

Calamagrostis hongii Paszko & Bing Liu, sp. nov.
urn:lsid:ipni.org:names:77212604-1
Figs 1–3

Deyeuxia zhongdianensis L. Liou (Liou 1994: 2235), nom. nud. (Art. 39.1 of the ICN, Turland et al. 2018; no Latin description and/or diagnosis). Cited material: “[CHINA. Yunnan] Zhongdian Co. [now Shangri-La] (K.M. Feng 3326), grassland under forest, riversides, 2700 m”.

Diagnosis. Calamagrostis hongii is similar in habit and spikelet morphology to C. arundinacea and C. effusiflora, but differs in color and hairiness of the upper (adaxial) leaf blade surface. The upper leaf surface of Calamagrostis hongii is characterized by the grey color (vs. green or grey-green in C. arundinacea and C. effusiflora), the presence of moderately impressed veins forming ribs (vs. leaf surface flat or veins only slightly impressed in C. arundinacea or veins moderately or distinctly impressed, forming ribs in C. effusiflora), the presence of numerous prickle hairs covering the ribs (vs. lack of prickle hairs on veins or ribs of C. arundinacea and C. effusiflora) and the absence of hairs (vs.
moderately or densely hairy in *C. effusiflora* and slightly or not hairy in *C. arundinacea*). *Calamagrostis hongii* is characterized by glabrous leaf sheaths, blades and collars.

**Type.** **China • Yunnan:** Shilin Co., Guishan, Haiyi village to Yumeidu village; alt. 2095 m; 24.647N, 103.542E; 18 August 2006; Y.M. Shui et al. 64471 (Holotype PE! [herb. no. 2308966], Isotypes PE! [herb. no. 2058824, 2070270].

**Description.** **Perennial grass,** cespitose, without rhizomes. **Culms** 55–140 cm tall, erect, unbranched above, 3–4.5 mm in diameter near the base, nodes 3–5, glabrous below the panicle. **Leaf sheaths** glabrous; **collar** glabrous; **ligules** 1.9–10 mm long, acute; **blades** 5–55 cm long, 4.3–9.5 mm wide, flat, slightly ribbed with glabrous furrows and scabrous ribs, upper (adaxial) surface scabrous owing to the presence of short stiff prickles on ribs, gray or gray–green, lower surface slightly scabrous, green, scabrous along margins. **Panicles** 13–25 cm long, erect, open, or loosely contracted at maturity; proximal internode 0.6–3.7(–4.5) cm long; rachis with 3–7 branches per node; **branches** 4–10 cm, slightly scabrous, spikelet-bearing only beyond mid-length. **Spikelets** 3.8–6.6 mm long, 1-flowered, with one fertile floret with rachilla extension, laterally compressed, disarticulation above the glumes; **glumes** subequal or equal, glabrous, very weakly scabrid on keel, apex acuminate; **lower glumes** 3.8–6.6 mm long and 0.9–1.4 mm wide, 1-veined; **upper glumes** 3.5–5.9 mm long and 1.1–1.6 mm wide, 3-veined, 0.8–1.1 times as long as the lower glume; **callus hairs** 1.0–2.9 mm long, 0.3–0.6 times as long as the lemmas; **lemmas** 3.5–4.8 mm long, 5-veined, 0.7–1.0 times as long as the lower glumes, apex 4-toothed; **lemmatal awn** 5.3–7.8 mm long, arising from near base (0.06–0.15 way up the back) of the lemmas, exserted, slender and easily distinguished from the callus hairs, geniculate, with twisted column; **paleas** 2.8–4.5 mm long, subequal or equal to the lemma, 0.8–1.0 times as long as the lemmas; **rachilla** extensions 1.0–2.8 mm long, densely bearded with hairs 2.4–4.2 mm; **stamens** 3, **anthers** 1.3–2.6 mm long. **Fl.** Jul–Aug. **Fr.** Aug–Sep.
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Figure 2. Illustration (drawn by Jolanta Urbanik) of Calamagrostis hongii Paszko & Bing Liu based on Y.M. Shui et al. 64471 (PE, herb. no. 2308966) from Shilin County (Yunnan, China) A habit B glumes C floret D anthers E rachilla prolongation. Scale bars: 5 cm (A); 1 mm (B–E).

Taxonomic note. Although Calamagrostis and Deyeuxia were revised for China only fourteen years ago in the “Flora of China” (Lu and Phillips 2006, Lu et al. 2006) it is necessary to present a new taxonomic account of these species because of the changes in generic circumscription and the description of new species. Calamagrostis hongii is
the third new species of Calamagrostis reported from China since the publication of the “Flora of China”. This new species is probably a member of the *C. arundinacea* complex and it is similar to *C. arundinacea* and *C. effusiflora* in habit and spikelet traits, including size of glumes, lemmas and paleas, presence of well-developed rachilla prolongation and a geniculate lemma awn with a twisted basal column, lemma awn length and its insertion on the lemma back (near the base to the lower 1/3). However, they differ in several diagnostic characteristics. Prior to this study, most of the specimens currently identified as *C. hongii* had been identified as *Deyeuxia pyramidalis* [= *Calamagrostis arundinacea*].

The detailed revision of this group of species by the present authors showed that the upper surfaces of the leaves of *C. hongii* are unique. They are gray in color and moderately or densely scabrous and characterized by the presence of moderately impressed veins forming ribs that are slightly or densely covered by numerous prickle hairs (Fig. 3). Such prickle hairs are absent from the upper surfaces of the leaf blades of *C. arundinacea* and *C. effusiflora*. The upper surface of the leaf blade of *C. arundinacea* has veins that are only slightly impressed and the leaf blade surface is almost flat and hairless or covered by scattered macro hairs (Fig. 4), whereas *C. effusiflora* has veins slightly to distinctly impressed, forming ribs that are usually moderately to very densely hairy (Fig. 5). All three species have prickly leaf edges. The prickle hairs have thick walls that can be silicified. For additional diagnostic characteristics see Table 1.

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**Figure 3.** Leaf (2nd leaf from the top) characteristics of *Calamagrostis hongii* Paszko & Bing Liu. A glabrous leaf collar, B leaf ligule, C upper (adaxial) leaf surface, D lower (abaxial) leaf surface. A–D China, Yunnan: Shilin Co., Y.M. Shui et al. 64471 (PE, herb. no. 2308966). Scale bars: 1 mm (A, B); 0.5 mm (C, D). Photographs by B. Paszko.
The designation *Deyeuxia zhongdianensis* L. Liou (Liou 1994: 2235) was described without Latin description or diagnosis. From January 1, 1935, to December 31, 2011, one or both had to be in Latin, thus *Deyeuxia zhongdianensis* is nomenclaturally invalid and therefore unavailable under the Article 39.1 of the ICN (Turland et al. 2018). Liou (1994: 2235) cited Feng’s collection no. 3326 from Zhongdian County (now Shangri-La) in Yunnan Province, but the herbarium was not specified by the author. In PE we located three herbarium sheets (PE01854125, PE02108399, PE02108400) collected at Mt. Wuzhujun at Shangri-La City (former Zhongdian Co.) in Yunnan Province. We identified Feng’s collection as *C. hongii*. Lu et al. (2006) incorrectly synonymized *Calamagrostis zhongdianensis* with *Deyeuxia pyramidalis* (= *C. arundinacea*).
Table 1. Diagnostic morphological characters of *Calamagrostis hongii*, *C. arundinacea*, and *C. effusiflora*.

| character                                                      | *C. hongii* | *C. arundinacea* | *C. effusiflora* |
|---------------------------------------------------------------|-------------|------------------|------------------|
| Panicle length (cm)                                           | 12–25       | 12–28            | 13–43            |
| Rachilla length (mm)                                          | 1.0–2.75    | 0.75–1.75        | 0.25–2.0         |
| Rachilla length with hairs (mm)                               | 2.4–4.4     | 1.55–4.25        | 1.5–4.0          |
| Anther length (mm)                                            | 1.35–2.6    | 2.15–3.3         | 1.2–2.75         |
| Leaf ligule length (mm) at the 2nd leaf from the top          | 1.9–10.3    | 0.9–5.5          | 0.8–18.0         |
| Ratio: palea to lemma length                                  | 0.8–1.0     | 0.7–1.1          | 0.8–1.0          |
| Colour of upper (adaxial) leaf blade surface                  | grey        | green            | grey-green, rarely green |
| Leaf veins on the upper (adaxial) leaf blade surface (in the middle of a leaf) | moderately impressed, forming ribs | only slightly impressed, leaf surface flat or almost flat | slightly to distinctly impressed, forming ribs |
| Upper (adaxial) leaf blade surface                             | moderately to densely scabrous, glabrous | smooth or covered with scattered macro hairs | slightly to densely hairy, macro hairs absent or present |
| Lower (abaxial) leaf blade surface                             | slightly scabrous | slightly scabrous | slightly scabrous |
| Presence of prickle hairs on leaf edges                       | present     | present          | present          |
| Leaf collar (the junction of the leaf sheath and blade)       | always glabrous | usually hairy, very rarely glabrous | usually glabrous, rarely hairy, the collar may also be found with a hairy margin |
| Altitude (m)                                                  | 1800–3350   | 0–2300           | 600–2900(?)      |

**Vernacular name.** 洪氏野青茅 (Chinese), Hong’s Bent-grass (English).

**Etymology.** The specific epithet honors Professor De-Yuan Hong, the Academician of Chinese Academy of Sciences (CAS) (State Key Laboratory of Systematic and Evolutionary Botany, Institute of Botany, CAS, Beijing, China) for his outstanding achievements in systematics, morphology, cytology, ecology and molecular evolution. The second author thanks Professor De-Yuan Hong for his continuous support during her multiple research visits to the Chinese herbaria as part of an exchange program between the Polish Academy of Sciences and the Chinese Academy of Sciences, in order to study the herbarium collections of *Calamagrostis* and *Deyeuxia* for the “Flora of Pan-Himalaya”.

**General distribution.** **CHINA** (S Chongqing, W Guizhou, Sichuan, SE Xizang, Yunnan).

**Distribution and habitat.** *Calamagrostis hongii* is endemic to south-western China. It is centered on the northern part of Yunnan and southern part of Sichuan and adjacent regions in south-western and central China, such as southern Chongqing, western Guizhou, central Sichuan and south-eastern Xizang. Its distribution covers the Southern Hengduan Mts and western and northern part of Yungui Plateau. A dot map provided here (Fig. 1) shows it to be common (or at least commonly collected) in north-western Yunnan, with three dots along the Chinese border with Kachin State of Myanmar, where it may also occur. *Calamagrostis hongii* is restricted to the Sino-Himalayan subkingdom, primarily the Yunnan Plateau and Hengduan Mountains (Peng and Wu 2013, Tang 2015). The species occurs in the montane belt from circa
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1800 m to 3350 m a.s.l., in grasslands, among bushes, forest edges and in mixed Pinus yunnanensis forests.

Phenology. Calamagrostis hongii flowers from July to August and is in fruit from August to November.

Additional specimens examined. China – Chongqing • Nanchuan Distr.; [29.168N, 107.105E]; 31 Oct. 1960; Nanshuibeidiao Exped. Team 4852 leg.; KUN (KUN0079536). – Guizhou • [Panzhou City (Panxian Co., Pan Co.)]; Mt. Bada; mountain top, bushy and sunny place; alt. 2620 m; [25.975N, 104.839E]; 22 Aug. 1959; Anshun Exped. Team 1119 leg.; KUN (KUN0081068), PE. – Sichuan • Dechang Co.; [27.405N, 102.173E]; 1 Sept. 1959; S.F. Zhu 20177 leg.; PE (PE01726895) • Kangding City, Guzan; alt. 2200 m; [30.12N, 102.177E]; 6 Aug. 1961; Nanshuibeidiao Exped. Team 9903 leg.; PE (PE01726896) • Kangding City, [Xinduqiao Township], (Thibet Orient.) Tongolo [东俄洛, Dong’eluo] (Principauté de Kiala); [30.079N, 101.48E]; Jun.–Jul. 1892; R.P. Soulié s.n. leg.; P (P02650457, P02650453), PE (PE00449806) • Meigu Co.; mixed forest; alt. 2220 m; [28.325N, 103.127E]; 3 Aug. 1959; Z.T. Guan 7448 leg.; PE (PE00449784) • Muli Co., Zhongmi; alt. 2700 m; [27.925N, 101.263E]; 18 Jul. 1978; K.H. Mou, Y.B. Yang 7390 leg.; CDBI (CDBI0154069) • Muli Co., alt. 2800–3350 m, [27.934N, 101.28E]; 15 Sept. 1959, S.K. Wu 3261 leg.;
KUN (KUN0081354), PE (PE00449779) • **Puge** Co., Tuomugou; forest, slope; alt. 1800 m; [27.381N, 102.54E]; 28 Aug. 1959; s.c. 5589 leg.; KUN (KUN0079385), PE (PE00449783) • **Puge** Co., Li’an; sunny slope; [27.312N, 102.508E]; 18 Aug. 1959; s.c. 5427 leg.; KUN (KUN0079386), PE (PE01726900) • **Puge** Co., Qiaowo Farm; alt. 1600 m; [27.489N, 102.54E]; 7 Aug. 1976; s.c. 14197 leg.; CDBI (CDBI0154083); PE (PE01727010) • **Yuexi** Co., Bao’an; alt. 2000 m; [27.879N, 102.561E]; 12 Jul. 1959; s.c. 5589 leg.; KUN (KUN0081352), PE (PE00449793) • **Yuexi** Co., Li’an; sunny slope; [27.879N, 102.561E]; 8 Aug. 1976; s.c. 14197 leg.; CDBI (CDBI0154083); PE (PE01726894) • unknown locality; alt. 2700 m; 30 Oct. 1965; Xizang Exped. Team s.n. leg.; PE (PE01727001). – **Xizang**: • **Zayü** Co. [formerly known as Tsaarung], Tsawarung, Nar-jou; *Pinus yunnanensis* forest; alt. 3300 m; [28.675N, 97.476E]; Sept. 1935; C.W. Wang 66441 leg.; KUN (KUN0081350) • **Zayü** Co., Xiachayu; alt. 2400–2600 m; [28.499N, 97.02E]; 30 Aug. 1983; B.S. Li et al. 6827 leg.; PE (PE01727016). – **Yunnan**: • **Anning** City, Mt. Bijia, bushes, limestone, alt. 2200 m; [24.993N, 102.459E]; 2 Sept. 1977; B.Y. Qiu 77844 leg.; CDBI (CDBI0154080), KUN (KUN0097423) • **Anning** City, Wenquan Town; pine forest; alt. 1880 m; [24.962N, 102.45E]; 14 Aug. 2006; E.D. Liu 1807 leg.; KUN (KUN0397297) • **Anning** City, Anfengying; [24.966N, 102.289E]; 22 Jul. 2007; Y.C. Liu, J. Xu 119 leg.; KUN (KUN1221260) • **Dali** City, Ta-li Hsien; pine forest; alt. 2400 m; [25.589N, 100.226E]; 28 Jul. 1933; H.T. Tsai 53898 leg.; KUN (KUN0081049), PE(PE00449810) • **Dali** City, Mt. Cangshan; grassland; [25.589N, 100.226E]; 3 Aug. 1963; Zhongdian Exped. Team 63-3845 leg.; KUN (KUN0081048) • **Dali** City, Mt. Cangshan; alt. 3000 m; [25.589N, 100.226E]; 1 Oct. 2002; H.Y. Ma 153 leg.; KUN (KUN0081035) • **Dali** City, Mt. Cangshan; [25.467N, 100.56E]; 20 Jul. 1906; F. Ducloux 4223 leg.; PE • **Dali** City, Mt. Cangshan, Zhonghe Temple; [25.68N, 100.132E]; 30 Nov. 1948; T.N. Liou 17405 leg.; PE (PE00449804) • **Dali** City; without precise locality; Sept. 1941; H.C. Wang 1386 leg.; PE (PE00449803). **Dongchuan** Distr., Kunming, Fazhecun, Damufang; [26.023N, 103.021E]; 16 Aug. 1964; Diandongbei Exped. Team 811 leg.; KUN (KUN0081296) • **Eryuan** Co.; alt. 2600 m; [26.113N, 99.949E]; 31 Sept. 1963; W Yunnan-Jinsha River Exped. Team 63-6292 leg.; KUN (KUN0081035) • **Eryuan** Co., without precise locality; alt. 2600 m; [26.113N, 99.949E]; W Yunnan-Jinsha River Exp. Team 63-6292 leg.; KUN (KUN0081353), PE (PE01726887, PE01726893) • **Fugong** Co., Famufang, forest; alt. 2700 m; [26.901N, 98.88E]; 23 Jun. 1978; Bijiang Exped. Team 715 leg.; KUN (KUN0097433) • **Gongshan** Co., Suroula; alt. 3000 m; [27.748N, 98.662E]; Sept. 1935; C.W. Wang 6658 leg.; PE (PE00449807) • **Guandu** Distr., Kunming, Shuanglong; grassland; alt. 1900 m; [25.119N, 102.862E]; 1 Sept. 1977; B.Y. Qiu 77700 leg.; CDBI (CDBI0154079), KUN (KUN0079418, KUN0079425) • **Heqing** Co., Huangping, Junle, Shangdapingzi; alt. 2500 m; [26.559N, 100.179E]; 16 Aug. 1963; Jinshaijiang Exped. Team 6555 leg.; KUN (KUN0081171), PE (PE01726857, PE01726891) • **Heqing** Co., Les patu-
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rages au col de Koua-la-po, pres Hokin; alt. 3000 m; 1883–1885; M. Delavay 2465 leg.; P (P02650445), PE (PE01938085, PE01663486), W (1916-38022) • Huize Co., Liangwang Shan, ca. 15 km E of Dongchuan ca. 120 km NNE of Kunming, on new rd. to Zhaotang via Zhehai; shallow grassy valley in low, red clay hills, with limestone substrate surrounded by 2nd growth Pinus yunnanensis, Alnus nepalensis, Quercus variabilis and Q. glaucoides forest, Capillipedium abundant; alt. 2280 m; 21 Jun. 1981; PE Mt. Hengduan Exped. Team 683 leg.; PE (PE01663487) • Lushui City, Pianma Town; grassland of forest edge; alt. 2100 m; [26.012N, 98.63E]; 30 Jul. 1978; Bijiang Exped. Team 1542 leg.; KUN (KUN0081066) • Panlong Distr., Kunming, Heilongtan; shady slope among high herbs; [25.141N, 102.751E]; 18 Jul. 2007; H. Peng et al. 68 leg.; KUN (KUN1221262) • Zhongdian Co. [now Shangri-La City], Mt. Wuzhujun; forest; alt. 2700 m; [27.817N, 99.707E]; 12 November 1939; Feng 3326 leg.; PE (PE02108400, PE02108399, PE01854125)

• Zhongdian Co. [now Shangri-La City], Xiaozhongdian, East Mt.; alt. 3250 m; [27.55N, 99.835E]; 13 Aug. 1981; s.c. W16 leg.; PE (PE01726860) • Zhongdian Co. [now Shangri-La City]; alt. 2900 m; 9 Jul. 1962; Zhongdian Exped. Team 2106 leg.; PE (PE01726889) • Xishan Distr., Kunming, Hsi-Shan [Xishan], near San-Ching-Ke; grassland; alt. 2100 m; [24.97N, 102.627E]; 11 Aug. 1945; T.N. Liou 19823 leg.; PE (PE00449802) • Yao’an Co., Daxingshan; alt. 2180 m; [25.514N, 101.242E]; 11 Jul. 1965; CAS Southwest Exped. Team 484 leg.; PE • Yi-liang Co., way to Yangzonghai; alt. 1800 m; [24.911N, 103.142E]; 6 Sept. 1977; B.Y. Qiu 771257 leg.; CDBI (CDBI0154088) • Yulong Co., Yangtze Watershed, Prefectural District of Lijiang, eastern slopes of Lijiang Snow Range; [26.877N, 100.234E]; May–Oct. 1922; J.F. Rock 5911A leg.; PE • same collection data as for preceding; J.F. Rock 5908 leg.; P (P02650461), W • Yulong Co., Lijiang (Likiang), Mt. Yulong-schan; Jun–Sept. 1914–1916; Handel-Mazzetti s.n. leg., Inter Sinense 1914–1918 no. 3790; W • Yongsheng Co., Boluo; edge of Pinus yunnanensis forest; alt. 2600 m; 16 Jul. 1960; Sino-Russia Exped. Team 6205 leg.; PE (PE01726892).
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