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## *Lysionotus bijantiae* is identified as a new synonym of *Henckelia oblongifolia* (Gesneriaceae)

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**Abstract:** A recently described new species of Gesneriaceae, *Lysionotus bijantiae* D. Borah & A. Joe, was misidentified; it is conspecific with *Henckelia oblongifolia* (Roxb.) D. J. Middleton & Mich. Möller. We treat *Lysionotus bijantiae* as a new synonym for *Henckelia oblongifolia* [previous *Chirita oblongifolia* (Roxb.) Sinclair] by examining relevant specimens and literature. The type specimens of *Lysionotus bijantiae* were collected from the southern slope of the Himalayas in Southeast Xizang, China. The diversity of Gesneriaceae in this area is also abundant. The authors attributed it to the genus *Lysionotus* because of its flower with two stamens, and compared it with other *Lysionotus* species because of its calyx 5-lobed above the middle, but they ignored the fact that the seed apex had no appendages. We observed that the seeds of this species in the populations of Motuo and the type localities both had no appendages by scanning the seeds with electron microscope, it is confirmed that this species is not a species of *Lysionotus*, but a species of *Henckelia*. At the same time, we offer the color images (including seeds scanned images) and the lectotype of *Henckelia oblongifolia*, and also describe the characteristics and distinguishing methods of the two genera *Henckelia* Spreng. and *Lysionotus* D. Don, in order to provide a reference for species identification of the two genera and avoid more confusion of species classification.

**Key words:** Gesneriaceae, *Lysionotus*, *Henckelia*, new synonym

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# 苦苣苔科植物 *Lysionotus bijantiae* 的名实订正

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**摘要:** 通过查阅相关文献和标本, 作者发现近期发表的苦苣苔科吊石苣苔属植物一新种——*Lysionotus bijantiae* D. Borah & A. Joe 实为鉴定错误, 应是汉克苣苔属的长圆叶汉克苣苔 [*Henckelia oblongifolia* (Roxb.) D. J. Middleton & Mich. Möller] [原长圆叶唇柱苣苔 *Chirita oblongifolia* (Roxb.) Sinclair]。 *Lysionotus bijantiae* 的模式标本采集于中国西藏东南部地区的喜马拉雅南坡, 该地区苦苣苔植物多样性较为丰富。作者因其花具 2 枚发育雄蕊而将其归于吊石苣苔属, 花萼分裂不达基部而与吊石苣苔属其他相关种类比较, 而忽略了其种子先端不具附属物的特征。通过电镜扫描观察到, 该种在墨脱境内居群以及其模式产地居群的种子均无附属物, 从而证实了该种不是吊石苣苔属的物种, 而是属于汉克苣苔属。因此, 作者将 *Lysionotus bijantiae* 处理为 *Henckelia oblongifolia* 的新异名, 同时提供了长圆叶汉克苣苔的彩色图片 (含种子扫描图)、选定模式标本, 并给出了吊石苣苔属和汉克苣苔属的区分方法和主要识别特征, 不仅为这两个属的物种鉴定提供了参考, 而且避免更多的物种分类混淆问题出现。

**关键词:** 苦苣苔科, 吊石苣苔属, 汉克苣苔属, 新异名

## 1 Introduction

Recently, a new Gesneriaceae species, *Lysionotus bijantiae* D. Borah & A. Joe from the southern slopes of the Himalayas was described, and only based on morphological characters (Borah & Joe, 2018). The authors pointed out that the new species differed from *Lysionotus gamosepalus* W. T. Wang in having erect sub-shrub habit, pubescent stem/leaves/peduncles/petioles, lanceolate and villous bracts, hairy calyx, cream corolla, curved filaments, connective not prolonged into an appendage, and cream and pubescent pistil. The description and the color plates are clear. The characters listed in the description make this plant a good new species of *Lysionotus* D. Don, but that is not the case after other key features are examined more carefully. For example, the authors described as “seeds numerous with hair-like appendages on each end”, but did not provide images of seeds for this

species in the paper. However, seeds from the mature capsules respectively collected from the type locality in 2020 and Motuo County, Xizang Autonomous Region, China in 2017 both have no appendages at either end of the seeds, which indicates the new species does not belong to the genus *Lysionotus*. In addition, there are three staminodes, and not two as reported in the original description, with a middle staminode significantly smaller than the others on the sides, therefore extremely easy to neglect. The species is also mistakenly identified as *Henckelia anachoreta* (Hance) D. J. Middleton & Mich. Möller in the taxonomic account from Northeast India, although the color plate clearly showed its morphological character (Sinha & Datta, 2016). These characters mentioned above are not in accordance with the new species of *Lysionotus* but well identical with *Henckelia oblongifolia* (Roxb.) D. J. Middleton & Mich. Möller (Wang et al., 1990, 1998; Weber et al., 2011) (Fig. 1).

The genus *Henckelia* Spreng. now consists of more

than 60 species mainly distributed in South, Southeast Asia and adjacent areas after the remodeling and summary (Weber et al., 2011; Ranasinghe et al., 2016). Thirty-three species are known to occur in India (Janeeha & Nampy, 2015; Möller et al., 2017; Borah et al., 2019) and 26 species in China (Möller et al., 2016; Xu et al., 2017; Cai et al., 2019; Wen et al., 2019; Yang et al., 2019). A comparison of relevant images (Fig. 1), specimens (Fig. 2) and literature/monographs/local floras confirms that *Lysionotus bijantiae* is conspecific with *Henckelia oblongifolia*.

## 2 Taxonomic treatment

*Henckelia oblongifolia* (Roxb.) D. J. Middleton & Mich. Möller, *Taxon.* 60: 776. 2011. *Chirita oblongifolia* (Roxb.) J. Sinclair, in *Bull. Bot. Soc. Bengal.* 9: 102. 1957; *Chirita oblongifolia* (Roxb.) B. L. Burtt, in *Notes. Roy. Bot. Gard. Edinb.* 22: 307. 1958, comb. superfl; Wood, 1. c. 33 (1): 174. 1974; Wang, in *Bull. Bot. Res.* 5(3): 70. 1985. *Incarvillea oblongifolia* Roxb. *Fl. Ind. ed.*, 2, 3: 113. 1832. *Chirita acuminata* Wall. ex R.Br., in *Cyrtandreae*: 117. 1839, nom. nud.; *Chirita acuminata* Steud., in *Nomencl. Bot.*, ed. 2, 1: 351. 1840, nom. nud.

*Lysionotus bijantiae* D. Borah & A. Joe, *Taiwania* 63 (3): 232, 2018, **syn. nov.** “**Type: INDIA.** Arunachal Pradesh. Lower Subansiri District, Potin, 27° 33' 88.75" N, 93° 79' 79.64" E, 22 Oct. 2017, *Dipankar Borah* 121989 (holotype CALI; isotypes CALI, ARUN)”.

The type information was cited from the paper (Borah & Joe, 2018), the initial longitude in the coordinates obviously inaccurate because of the emergence of 79', and the coordinates should be revised to “27° 20' 13.03" N, 93° 47' 24.51" E” after the confirmation. The original record showed that the type specimen was collected from India. However, when the revised coordinates (“27° 20' 13.03" N, 93° 47' 24.51" E”) were marked on the online database of the map

(Map World, 2020), the site was located in Cuona County, Xizang Autonomous Region, China. Therefore, we dispute the type locality information in the initial description. Here, we just focus on solving the scientific problem and treat *Lysionotus bijantiae* as a new synonym of *Henckelia oblongifolia*.

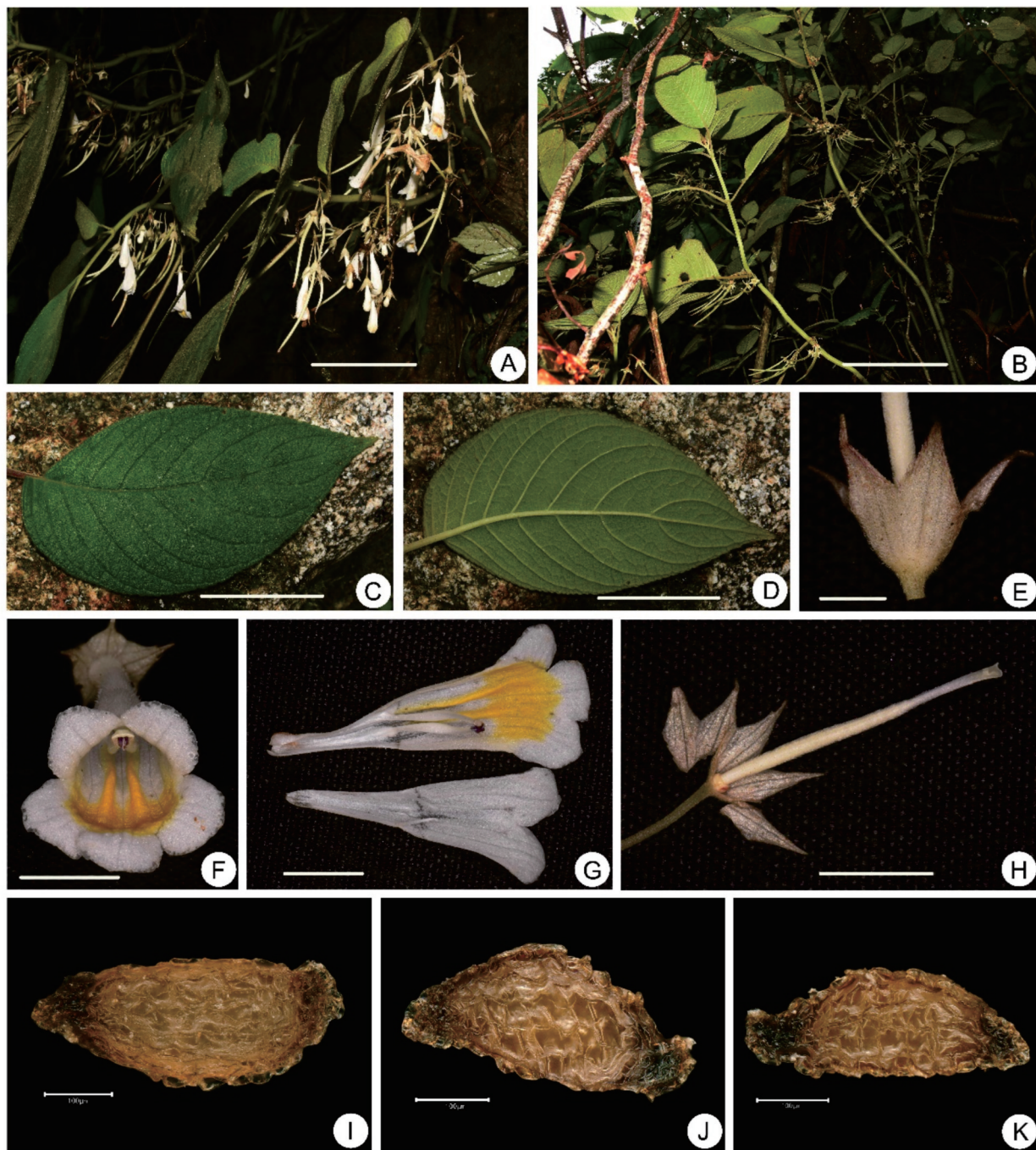
**Lectotype: BANGLADESH.** Chittagong, October 1810, *Roxburgh* 238 (BM!). (Lectotypified by Wood in *Notes. Roy. Bot. Gard. Edinb.* 33: 174. 1974).

**Phenology:** Flowering from August to October; fruiting from September to December.

**Distribution:** Bangladesh, Bhutan, China (Xizang and Yunnan), Northeast India and North Myanmar.

**Specimens examined: CHINA.** Xizang: Motuo County, Bangxin, Lanlong-Yajiang, 1 100 m, 28 December 1982, *B. Li S. & S. Z. Cheng* 02324 (PE); Beibeng, 750 m, 17 August 1974, *Qingzangdui* 4307 (KUN); Beibeng, Xigong Lake, 1 500 m, 10 March 1983, *B. S. Li & S. Z. Cheng* 02900 (PE); Beibeng-Motuo, 960 m, 4 August 1974, *Qingzangdui* 1550 (PE); Damu-103k, 1 400 m, 29 October 1982, *B. S. Li & S. Z. Cheng* 01560 (PE); East of Dexing Bridge, 870 m, 8 February 1983, *B. S. Li & S. Z. Cheng* 03554 (PE); Miri-Motuo, 750 m, 5 September 1974, *Qingzangdui* 5055 (KUN); Motuo-Dexing Bridge, 736 m, 9 October 2017, *L. Cai & Z. L. Dao* CL009 (KUN); Xianaba-Damu, 1 900 m, 26 October 1982, *B. S. Li & S. Z. Cheng* 01364 (PE); Ximeng River, 900 m, 22 August 1980, *W. L. Chen* 14459 (PE); Yarang River, 900 m, 10 September, *W. L. Chen* 15047 (PE). Yunnan: Gongshan County, Dulong River, Dadieshui, 1 300 m, 18 December 1990, *Dulongjiangkaochadui* 1173 (KUN); Gongshan County, Dulong River, Qinlangdang, 1 300 m, 10 March 1991, *Dulongjiangkaochadui* 4464 (KUN); Kiukiang Valley, South Kongpong, 1 200 m, 26 September 1938, *T. T. Yu* 20458 (PE, E). **BANGLADESH.** East Bengal, April 1863, *Herbarium of the late East India Company* 3829 (P); Kelaciili, 8 December 1944, *J. Sinclair* 3853 (E); Pundua, *F. De*





A. Plants with flowers and young fruits; B. Plants with fruits; C. Adaxial leaf surfaces; D. Abaxial leaf surfaces; E. Calyx; F. Corolla mouth; G. Opened corolla showing stamens and staminode; H. Pistil with calyx; I–K. Seeds. Scale bars: A, C, D = 5 cm; B = 10 cm; E = 5 mm; F, G, H = 1 cm; I, J, K = 100  $\mu$ m.

Fig. 1 *Henckelia oblongifolia*

*Silva* 802 (K). **BHUTAN**. Near Zimgang, shongar Chu nr Mongar, 1 475 m, 15 June 1979, A. J. C. Grierson & D. G. Long 1964 (E). **INDIA**. Assam, Dehho, 700 ft. (ca. 213 m), 29 March 1895,

11044 (P); Assam, Haflong, 2 500 m, August 1908, William G Craib 192 (E); Assam, Master (P); Niwoa to Wawa, 1 441 m, 2 September 1958, G. Panigrahi 15046 (E); 5 000 ft. (ca. 1 524 m),



The picture(BM000092133) was download from JSTOR (<http://plants.jstor.org>).

Fig. 2 Lectotype of *Henckelia oblongifolia*

1 September 1892, *Dr King* (E, P); Pynursla, 25 November 1956, *G. Panigrahi* 4633 (E); Pynursla,

Khasi, Hills, 4 000 ft. (ca. 1 219 m), 23 August 1949, *T. R. Chand* 2059 (E); Lower Subansiri



District, Potin, 1 Nov. 2017, *D. Borah* 121990 (CALI); Lower Subansiri District, Potin, 21 Jan. 2020, *D. Borah* 5067 (HAU 2029). **MYANMAR.** Kachin State: Nдум-Zup to Hpuginhku, 6 000–6 500 ft. (ca. 1 830–1 980 m), 30 December 1961, *J. Keenan, U Tun Aung & Tha Hla* 3092 (E); Namnca to Nammuca, 1 000 ft. (ca. 305 m), 1910, *J. H. Lace* 5187 (E); Surrounds of Hpuginhku 5 000 ft. (ca. 1 524 m), February 1962, *J. Keenan, U Tun Aung & Tha Hla* 3691 (E); Upper Burma: Nwai Valley, 9 September 1914, *F. Kingdon-Ward* 1931 (E); Upper Chinawin: Kodan Channg near Yeson Camp, 800 ft. (ca. 244 m), 26 November 1917, *C. Gilbert Rongers* 1023 (E); Valley of the Nam Tamai, 3 September 1937, *F. Kingdon-Ward* 13122 (E). **Country of origin:** not specified; P03884206 (P); P03884207 (P); P03884209 (P); P03884210 (P); P03884213 (P); P038842134 (P).

### 3 Notes

In the traditional classification of Chinese Gesneriaceae, the genus *Lysionotus* was deposited into Trib. Trichosporeae Fritsch, Subfam. Cyrtandroideae Burnett, based on the understanding that seeds of all species of *Lysionotus* have appendages at each end of the spindly seed. In *Henckelia*, there are no appendages on the apexes of the seed (Wang et al., 1990, 1998; Li & Wang, 2005). The scanned seed morphology of this species shows that it should not belong to *Lysionotus* because it lacks appendages at each end of the seed. The species, *Lysionotus bijantiae*, cannot be distinguished from other many collected specimens of *Henckelia oblongifolia* from Bangladesh, Bhutan, China, India and Myanmar, which are stored in BM, CALI, HAU, KUN, PE, E and P.

*Lysionotus* was once divided into three sections,

Sect. *Didymocarpoides* W. T. Wang, Sect. *Lysionotus* and Sect. *Cyathjocalyx* W. T. Wang (Wang, 1983). The vast majority of *Lysionotus* species share a special character: leaves usually many, along stem, whorled by three ones. Although the description of three species in Sect. *Didymocarpoides* [*Lysionotus longipedunculatus* (W. T. Wang) W. T. Wang, *L. oblongifolius* W. T. Wang and *L. denticulosus* W. T. Wang] show their leaves are opposite, but their leaves are usually whorled after carefully observation for specimens and living plants in the field (Li & Wang, 2005). There are a few species, *L. wilsonii* Rehd., *L. sulphureus* Hand.-Mazz., *L. kwangsiensis* W. T. Wang in Sect. *Lysionotus* and only one species, *L. chingii* Chun ex W. T. Wang, in Sect. *Cyathjocalyx* having opposite leaves (Wang, 1975a, b). Furthermore, the key characters to distinguish Sect. *Didymocarpoides* from other two sections are as below: erect subshrub, no phellem on stem, chartaceous leaf blades, smaller flowers, calyx 5-sect from base, shorter subulate appendages (0.1–0.25 mm long) on the apexes of the seed. So, although *Lysionotus bijantiae* looks like a member of Sect. *Didymocarpoides* in appearance, it is entirely different from *Lysionotus* because of the lack of appendages at each end of the seed.

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