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越南苦苣苔科植物国家级分布新纪录——大苞漏斗苣苔

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摘 要：漏斗苣苔属 *Raphiocarpus* Chun 是分布于中国至中南半岛一带的小属，主要产于我国华南西南抵越南北部至中部，但之前两国共有分布的本属物种仅有 3 种。大苞漏斗苣苔 *R. begoniifolius* (Lévl.) Burtt 一度被认为是中国的特有种，仅分布在广西西北部、贵州西南部、云南东南部和湖北西北部，未见在越南的报道。本文首次报道了越南植物区系中大苞漏斗苣苔的国家级分布新纪录，使得两国共有分布的本属物种上升到了 4 个，并着重讨论了大苞漏斗苣苔与其近缘种长筒漏斗苣苔 *R. macrosiphon* (Hance) Burtt 的区别特征，进一步完善了越南所分布的漏斗苣苔属植物检索表。同时根据两国的各自与联合野外考察工作对本种的濒危现状进行了讨论，为中越两国开展该种乃至本属植物的保育提供了直接的证据。凭证标本存于越南生物资源与生态研究所标本馆（HN）。

关键词：越南北部，漏斗苣苔属，越南植物区系，中国植物区系

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Notes on taxonomy of *Raphiocarpus begoniifolius* (Lévl.) Burtt (Gesneriaceae) from Vietnam

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Abstract: *Raphiocarpus* Chun is a small genus includes all species from southern and southwestern China to northern and central Vietnam. However, there are only three species can be found in both countries formerly. *R. begoniifolius* (Lévl.) Burtt was once considered as an endemic species of China, and it is distributed in China (northwestern Guangxi, southwestern Guizhou, southeastern Yunnan and northwestern Hubei), but there is not reported on flora of Vietnam. This species is here reported as the first record for the flora of Vietnam, so it makes the codistributed species number of *Raphiocarpus* in both countries has been risen from three to four.

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Notes on taxonomy and distinguishable discussion from its congener, *R. macrosiphon* (Hance) Burtt, are provided. The further improved key to species of *Raphiocarpus* in Vietnam is showed here. According to the field studies by both countries, respectively and/or jointly, we also discussed the endangered status of *R. begoniifolius* so that it furnishes direct evidence for the conservation of this species and, even, this genus in China and Vietnam. The voucher specimens are hold in Herbarium of Institute of Ecology and Biological Resources (HN).

Keywords: North Vietnam, *Raphiocarpus* Chun, flora of Vietnam, flora of China

1. Introduction

The genus, *Raphiocarpus* Chun, originally described as a monotypic genus (Chun, 1946). It was merged into *Didissandra* C.B.Clarke by Wang (1980) after three decades. However, the results showed that the Sino-Vietnamese species of *Didissandra* are not congeneric with the Malesian species (which themselves had to be split into two genera, *Didissandra* and *Ridleyandra* A.Weber & B.L.Burtt) (Weber & Burtt, 1998). Thus, according to presently understanding, *Raphiocarpus* should include all species from China and Vietnam formerly placed in *Didissandra*. Further up, these species of the redefined *Raphiocarpus* are generally very ill-known and are quite possible that those species do not form a homogeneous group (Weber & Burtt 1998, 1997; Sontag & Weber, 1998; Vitek et al, 1998). In other words, the genus may prove artificial, when the species (and adjacent genera) are better known (Weber & Skog, 2007).

At present, *Raphiocarpus* with fourteen currently recognized species, has its main distribution from southern and southwestern China to northern and central Vetnam (Li & Wang, 2004; Zhang et al, 2010; Pellegrin, 1930; Ho, 2000; Phuong, 2005; Phuong & Xuyen, 2010; Phuong et al, 2012). *Raphiocarpus petelotii* (Pellegr.) B.L.Burtt and *R. sinicus* Chun, do also occur in Vietnam (Li & Wang, 2004; Phuong, 2005; Phuong & Xuyen, 2010). The distribution area of *R. longipedunculatus* (C.Y. Wu ex H.W.Li) B.L.Burtt, *R. maguanensis* Y.M.Shui & W.H.Chen and *R. jinpingensis* W.H.Chen & Y.M.Shui in Chinese Yunnan (Pingbian, Maguan, Jinping, Lüchun) are very close to the border of Vietnam and these species might be discovered in Vietnam in the future (Li & Wang, 2004; Wei et al, 2010; Zhang et al, 2010). Recently, we recognized and identified some species of this genus from the specimens of Gesneriaceae in the Hanoi Herbarium (HN). The 'Checklist of plant species of Vietnam' includes five species of *Didissandra* C.B.Clarke, now *Raphiocarpus*, in Vietnam. They are *Raphiocarpus annamensis* (Pellegr.) B.L.Burtt, *R. asper* (Drake) B.L.Burtt, *R. clemensiae* (Pellegr.) B.L.Burtt, *R. evrardii* (Pellegr.) B.L.Burtt, *R. petelotii*, *R. sinicus* and *R. tamdaoensis* V.X.Phuong, D.T.Xuyen &

Y.G.Wei (Phuong, 2005; Phuong et al, 2012). After consulting relevant literature (Pellegrin, 1930; Burtt, 1954; Burtt & Tan, 1984; Wang & Li , 1992, 1998; Ho, 2000; Weber, 2004; Wei et al, 2010; Zhang et al, 2010, Phuong & Xuyen, 2010; Phuong et al, 2012), as well as herbarium specimens in Vietnam and China, we considered that our unknown species from Vietnam should be *R. begoniifolius* (Lévl.) Burtt, which is new record to Vietnam.

2. Results and analysis

2.1 Taxonomy and specimens' information

Raphiocarpus begoniifolius (Lévl.) Burtt in Beitr. Biol. Pflanze 70: 173. 1998.——Didissandra begoniifolia Lévl. in Repert. Sp. Nov. 11: 495. 1913; Burtt in Not. Bot. Gard. Edinb. 23(3): 100. 1960; Lauener & Burtt in l. c. 38(3): 467. 1980; K.Y. Pan in W. T. Wang, Fl. Reip. Pop. Sin. 69: 231, tab. 59: 5–9. 1990; W. T. Wang et al. in Z. Y. Wu & Raven, Fl. China 18: 282. 1998.——*Chirita chamydata* W. W. Smith in Not. Bot. Gard. Edinb. 10: 170. 1918.——*Loxostigma begoniifolium* (Lévl.) Anthony in l. c. 18: 199. 134. Type: CHINA. Yunnan, Red River from manmer. J. Esquirol 972 (E, holo!).

Additional specimens examined: Vietnam: Hà Giang prov., Quản Bạ distr., Cao Mã Pờ comm., Vàng Chá Phìn vill., subtropical evergreen broad-leaved forest on silicate mountain, around point 104°49′05.4″E, 23°05′24.3″N, elevation of 1 650 –1 700 m a. s. l. perennial herb about 30–60 cm tall, flower purple, common in humid shaded areas of mountain slopes, Nguyen Sinh Khang, Nguyen Quang Hieu & Tu Bao Ngan, *NSK 977*, *NSK 981*, September 14, 2017.

2.2 Distribution and conservation

Ecology: Grows on wet humus-soil or crevices of rocks covered with humus under thickets and subtropical evergreen broad-leaved forest on slopes, at an elevation of 1 200–2 100 m above sea level. Flowering: August - September; Fruiting: September - October.

Distribution: CHINA (Guangxi, Yunnan, Guizhou and Hubei) and new to VIETNAM (Hà Giang prov., Quản Bạ distr., Cao Mã Pờ comm.)

Conservation status in China and Vietnam: Because the populations found in Guangxi, Guizhou, Yunnan and Hubei of China and North Vietnam, are growing well with abundant individuals in different populations, we estimate that this species will not easily become extinct. During our field work, although we found that farmlands and fruit plantations were expanding in

these areas, which would result in deforestation, habitat loss and fragmentation of this species, the individuals and populations of *R. begoniifolius* are abundant in two countries. Thus, following the IUCN (2017) red list categories and criteria, the conservation status of this species is Least Concern (LC).

2.3 Notes on taxonomy and the key of *Raphiocarpus* in Vietnam

The vegetative organs of *Raphiocarpus begoniifolius* (Lévl.) Burtt look similar to *R. macrosiphon* (Hance) Burtt if there is no flower, but the flowers of the latter are orange-red and are entirely different from the pale-purple or rusty lilac to purple flowers of the former. After a new species of *Raphiocarpus*, *R. tamdaoensis* V.X. Phuong, D.T. Xuyen & Y.G. Wei, was published by Phuong et al(2012) and this new record was confirmed, there are nine species of *Raphiocarpus* in Vietnam in all. Here we present the further promoted identification Key to all known species of *Raphiocarpus* occurring in Vietnam.

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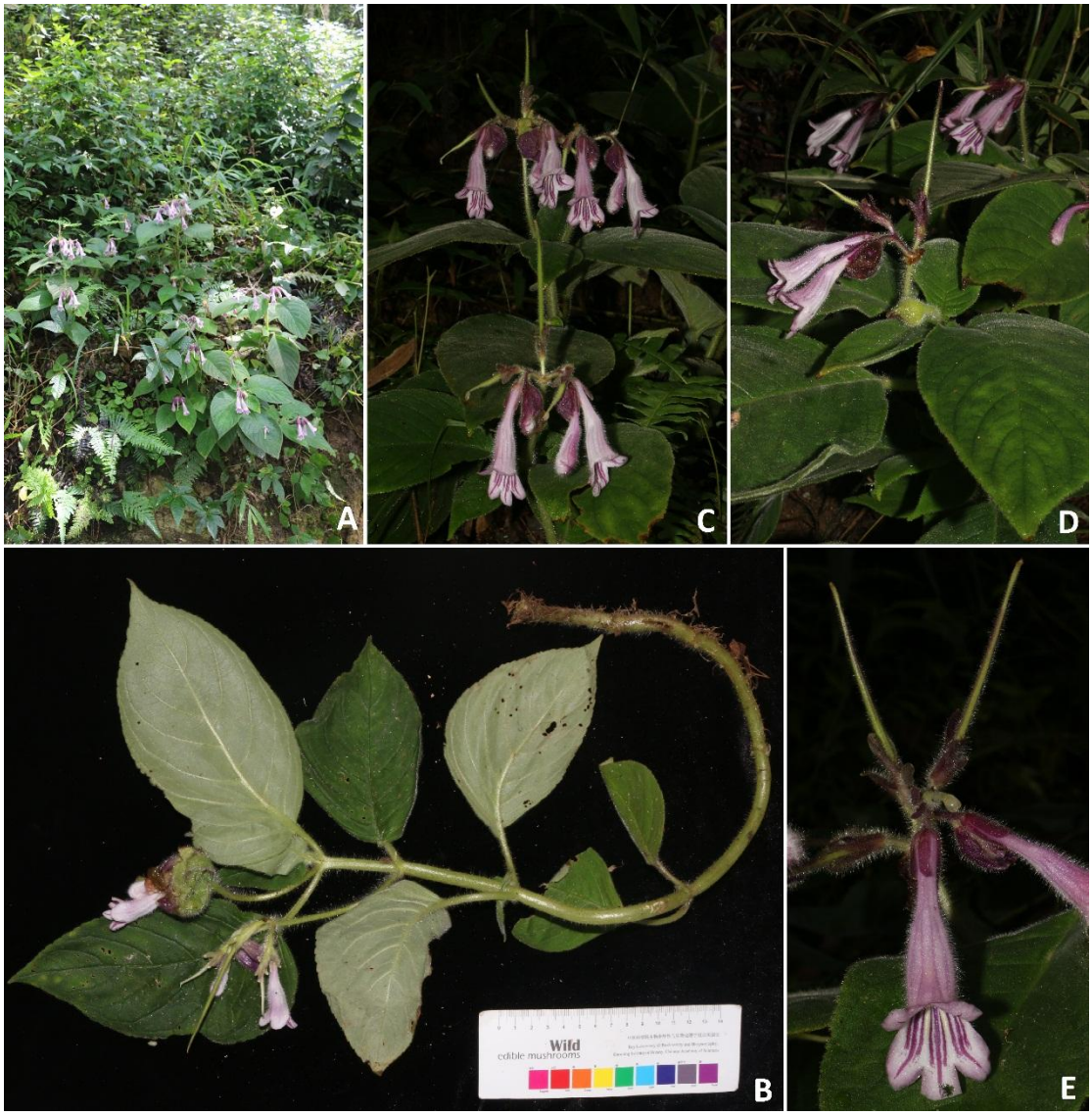
Identification key to species of *Raphiocarpus* occurring in Vietnam

1. Calyx separate, calyx lobes deeply divided to base or near base
    2. Calyx glabrous
        3. Peduncle about 5 cm long; corolla bluish green, 3 – 4 cm long …….1. ***R. annamensis***
        3. Peduncle very short, less than 1 cm long; corolla whitish green or reddish, 12 – 15 mm long……..…….2. ***R. sinicus***
    2. Calyx pubescent.
        4. Bract 2.0 – 3.0 cm long; corolla whitish purple to violet…… 3. ***R. begoniifolius***
        4. Bract less than 1.0 cm long; corolla yellow, orange-red or white.
            5. Ovary glabrous
                6. Peduncle 10 – 20 cm; corolla yellow, 2.5 – 3.0 cm; fruit 6 – 7 cm long…...……4. ***R. asper***
                6. Peduncle 1.5 – 4.5 cm; corolla orange-red, 6 – 7 cm; fruit 3.0 – 5.0 cm long……..5. ***R. macrosiphon***
            5. Ovary pubescent
                7. Cymes 1-flower; peduncle 3.0 – 5.0 cm; corolla yellowish, 3.0 – 4.0 cm long……..…6. ***R. tamdaoensis***
                7. Cymes 3-5 flowers; peduncle 7.0 – 9.0 cm long; corolla white, with violet longitudinal limes at throat, 4.0 – 5.0 cm long …..…… 7. ***R. evrardii***

1. Calyx united at base, with tube funnel or cup form.
    8. Leave pubescent; calyx tube funnel form, 15 mm long, calyx lobe 5 mm long; corolla yellowish, 3.5 – 4.5 cm long…. 8. ***R. petelotii***
    8. Leave glabrous; calyx tube cup form, 6 – 9 mm long, calyx lobe 3 mm long; corolla white, 2.5 – 3.0 cm long. ……9. ***R. clemensiae***



Note: **A**. Habitat; **B**. Habit and cymes; **C**. Frontal view of cymes; **D**. Lateral view of cymes; **E**. Frontal view of corolla in natural status. (Photoed by Dr. Khang Sinh Nguyen)

Fig.1 *Raphiocarpus begoniifolius* (L évl.) Burtt

Note: **A**. Abaxial and adaxial views of leaves; **B** , **C**. Cymes; **D**. Abaxial surface of bract; **E**. Adaxial surface of bract; **F**. Flower with corolla and calyx lobes; **G**. The secondary bracts; **H**. Lateral view of corolla and calyx lobes; **I**. Opened corolla showing stamens, staminodes, and pistil; **J**. A pair of stamens; **K**. Crossed section of ovary. (Photoed by Dr. Khang Sinh Nguyen)

Fig.2 Exploded view of *Raphiocarpus begoniifolius* organs