

## ***Spiradiclis spathulata* (RUBIACEAE), A NEWLY RECORDED SPECIES FROM VIETNAM**

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### **SUMMARY**

*Spiradiclis spathulata* was described by X. X. Chen & C. C. Huang in *Guihaia* (13: 3. 1993) which was based on several specimens with unknown capsules and recorded as an endemic species to China. In accordance with the collections from Cat Ba National Park, *Spiradiclis spathulata* was discovered as a new record for the flora of Vietnam, and the description and some figures of this species were provided. *Spiradiclis spathulata* is different from other *Spiradiclis* species in Vietnam by its short or hardly developed stems with leaves clustered at base, petiole 3 - 7 mm long, and corolla tube 17 - 25 mm long. Only a few small populations of this taxon are found in Ningming, Longzhou, and Pingxiang of Guangxi province (China) and Cat Ba National Park (Vietnam). In the Cat Ba National Park, *Spiradiclis spathulata* grows sparsely in evergreen broad leaved forest on the slope of limestone near Ao Ech location. The species is used for ornamental plants or ethnic medicine. According to IUCN Red list Categories and Criteria (IUCN 2012), *Spiradiclis spathulata* should be categorized as Vulnerable.

**Keywords:** Cat Ba, new record, Rubiaceae, *Spiradiclis spathulata*.

### **1. INTRODUCTION**

The genus *Spiradiclis* Blume consists of about 45 species distributing in Bhutan, China, India, Indonesia, Myanmar, and Vietnam (two species and a variety in Vietnam). Its members are herbs which usually grow at the slopes of limestone.

*Spiradiclis spathulata* was described by X. X. Chen & C. C. Huang in *Guihaia* (13: 3. 1993). These authors based on several specimens with unknown capsules (*Huang Chang Chun* 22986) which were collected in Duolong Xiang, Ningming Xian of Guangxi province (China). So far, specimens of this species were collected only in limestone areas of Guangxi province (Ningming, Longzhou, and Pingxiang).

In June 2015, during the field trip to Ao Ech in the Cat Ba National Park, we found some beautiful flower plants growing on slopes of limestone. These plants have short stems with leaves crowded at base and purplish red corolla. We only took some pictures and did not collect specimens. In June 2016, at the same position, the implementers collected specimens of this species. After examining the specimens and consulting several relevant

literatures, we found that the species is close to *Spiradiclis spathulata* which was recorded as an endemic species to China. Therefore, *Spiradiclis spathulata* is a newly recorded for the flora of Vietnam. Based on the collections from Vietnam, detailed description and some figures of this species have been provided.

### **2. RESEARCH METHODOLOGY**

**Materials (Additional specimens examined):**

***Spiradiclis spathulata* X. X. Chen & C. C. Huang: VIETNAM. Hai Phong:** Cat Ba National Park, E107°01.158', N20°47.925', 09 June 2016, *Phan Duc Linh* 201606090101, 201606090102, 201606090103, 201606090104 (VNF); **CHINA. Guangxi:** Ningming County Longgang nature reserve, 300m, 25 May 2008, *China Plantation Guangxi Group 1153* (IBK Barcode 00216132, 00280455); same locality, 300m, 13 October 2008, *China Plantation Guangxi Group 3864* (IBK Barcode 00216133); same locality, 230 m, 18 July 2009, *Huang Yu Song, Wu Wang Hui, Chen Feng Lin H09175* (IBK Barcode 00216130); same locality, 250 m, 09 July 2010, *Xu Wei Bin, Wu Wang Hui 10522* (IBK Barcode 00216109); same locality, 200 - 370 m, 28 July

2011, *Huang Yusong, Liao Yunbiao, etc. NM1521* (IBK Barcode 00206664); Ningming County Longrui Station, 230 m, 02 August 2009, *Ye Xiao Xia, Wu Wang Hui, Nong Dong Xin H09954* (IBK Barcode 00216129); Longzhou County Nonggang, 480 m, 21 August 2008, *China Plantation Guangxi Group 2085* (IBK Barcode 00216134); Longzhou County Xiangshui Longgan, 210 m, 25 September 2011, *Liu Yin, Peng Ri Cheng JRH2482* (IBK Barcode 00280454); Pingxiang, near Youyi Guan, 250 - 350 m, 14 October 2008, *China Plantation Guangxi Group 3883* (IBK Barcode 00280453);

***Spiradiclis caespitosa* Blume:**  
**INDONESIA. Java, C. L. von Blume s.n.** (Types: NY Barcode 133354, 133355; L Barcode 0001355); **CHINA. Yunnan:** Szemao, *Henry A. 12294C* (K Barcode 000172577); **THAILAND.** October 1922, *Kerr Arthur Francis G. 6459* (TCD Barcode 0017397); **VIETNAM. Cao Bang:** Pia Ouac, 500m, July 1922, *Pételot 713* (P Barcode 03801719); **Quang Ninh:** Ha Long, November 1921, *Pételot 273* (P Barcode 03801722, 03801722);

***Spiradiclis leptobotrya* (Drake) Pitard:**  
**VIETNAM. Hoa Binh:** Cho Bo, 12 November 1887, *B. Balansa 2635* (Holotype: L Barcode 0001357; Isotypes: P Barcode 03801710, 03801710); **Lao Cai:** Sa Pa Muong Sen, 1000m, July 1927, *Pételot 3135* (P Barcode 03801712, 03801713, 03801714, 03801715);

***Spiradiclis leptobotrya* (Drake) Pitard var. *longiflora* Merr.:** **VIETNAM. Hoa Binh:** Muong Thon, October 1937, *P. A. Pételot 6405* (Holotype: GH Barcode 00444382; Isotype: GH Barcode 00444383).

**Methods:** Morphological comparison. Comparing specimens which were collected in Cat Ba National Park (*Phan Duc Linh 201606090101, 201606090102, 201606090103, 201606090104*) with the other specimens of *Spiradiclis* (focusing in types of specimens) deposited in A, GH, IBK, K, L, NY, P, TCD

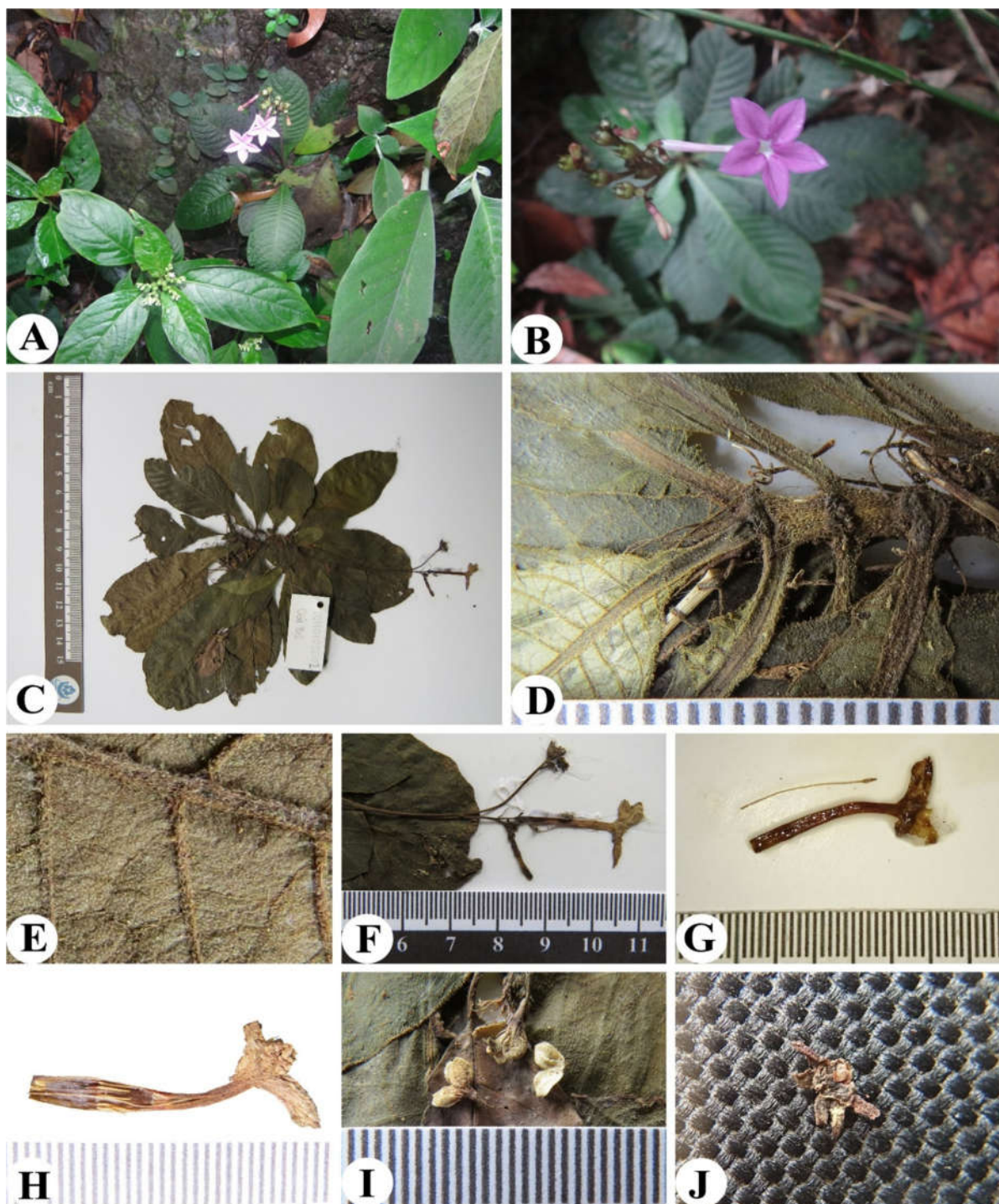
herbaria, and consulting the related important taxonomic literatures (Chen X. X. & Huang C. C., 1993; Lo H. S., 1999; Pham H. H., 2000; Tran N. N., 2005; Chen T. & Taylor C. M., 2011; Pan B. *et al.*, 2016; Liu J. *et al.*, 2017) were carefully made. The taxonomically morphological features: Stems, Leaf; Petioles; Stipules; Inflorescences, Calyx; Corolla; Tube; Stamens; Ovary and Capsules are used for comparison across the species.

### 3. RESULTS AND DISCUSSION

***Spiradiclis spathulata* X. X. Chen & C. C. Huang - *Lưỡng luân cát bà* (Figs.1, 2) - a newly recorded species in Vietnam.**

X. X. Chen & C. C. Huang, 1993. *Guihaia*, 13(1): 3-4, fig. 1-4; H. S. Lo, 1999. *Fl. Reip. Pop. Sin.* 71(1): 91, fig. 20 (5-9); T. Chen & C. M. Taylor, *Fl. China*, 19: 338.

Perennial herbs, rosulate, up to 5 cm in height, short or hardly developed stems with leaves clustered at base, pubescent, internode length 1 - 2.5 mm. Leaves blade drying papery, spatulate or obovate to oblanceolate, 5 - 13 x 2 - 5 cm apex rounded to obtuse, base acute to cuneate and usually decurrent, adaxially green, sparsely pubescent, adaxially light green, densely pubescent at least along principal veins; lateral veins 12 - 23 pairs, erect pubescent; petiole 3 - 7 mm, pubescent; stipules linear, 7 - 12 mm long, densely villosulous. Inflorescence cymose, 5 - 11 flowers, peduncle 6 - 10 cm long; pedicels 2 - 3 mm, pubescent; calyx pubescent; hypanthium obconic, 1.5 - 2 mm; limb deeply lobed; lobes 5, narrowly lanceolate, 1 - 2 mm; corolla purplish red, slenderly salverform, puberulent outside, corolla tube 17 - 25 mm long inside with villous ring at middle, ca. 1.5 mm; stamens 5, adnate about 6 mm higher than the base of the corolla, filament ca. 1mm long, anthers linear, ca. 2.5 mm long; styles slender, 15 - 20 mm long, glabrous, stigma long subovate ca. 1.5 - 2 mm long. Capsules subglobose, ca. 2 mm in diam., persistent calyx linear, ca. 1.5 mm long, valves 4. Seeds numerous, granulate.

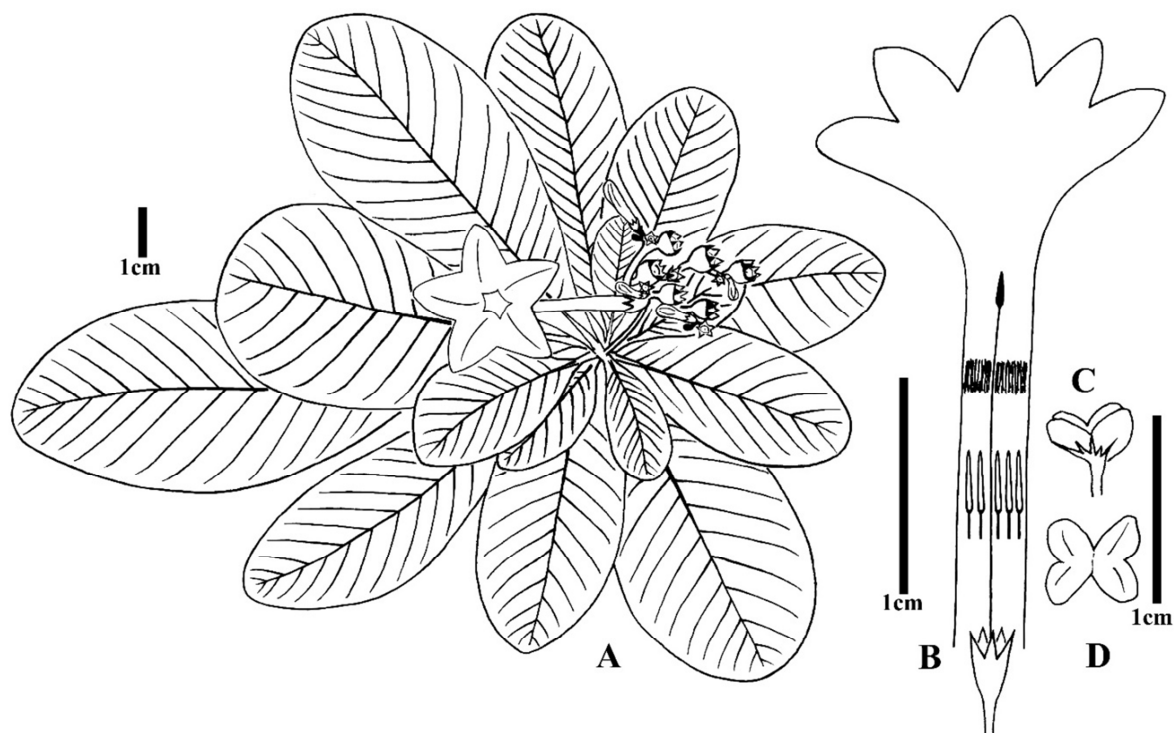


**Figure 1. Morphological characteristics of *Spiradiclis spathulata***

A. Natural habitat in Cat Ba; B. Plant with inflorescence and young capsules; C. Dried specimen with number *Phan Duc Linh 201606090102*; D. Vegetative branch, showing the linear stipules, petioles and hairy leaves; E. Hairy leaf abaxially; F. Flowering branch; G. Corolla tube, style and stigma; H. Corolla tube and anthers; I. Infructescence, showing the dehiscent mature capsules; J.

Young capsules and seeds

(Photos by Vuong Duy Hung, all from Cat Ba National Park, Vietnam)



**Figure 2. *Spiradiclis spathulata* details**

A. Habit; B. Longitudinally dissected flower, showing the positions of anthers and style; C, D. Dehiscent mature capsules.

(Drawn by Vuong Duy Hung, based on the collections from Cat Ba National Park, Vietnam)

**Type: CHINA. Guangxi:** Ningming Xian, Duolong Xiang, shade, on rocks, 20 May 1991, C. C. Huang, 22986 (Holotype: GXEM)

**Distribution and habitat:** China (Guangxi: Ningming, Longzhou and Pingxiang) and Vietnam. In Vietnam, *Spiradiclis spathulata* is only found in Cat Ba National Park. It grows sparsely in evergreen broad-leaved forest on the slope of limestone. It is usually associated with Ferns, *Chirita hamosa* R. Br. (Gesneriaceae), *Ophiorrhiza* sp. (Rubiaceae), *Ficus pumila* L., *Streblus macrophyllus* Blume (Moraceae), *Rinorea bengalensis* (Wall.) Kuntze (Violaceae), etc.

**Uses:** Ornamental plants or ethnic medicine.

**Conservation:** Only a few small populations of this taxon are found in Ningming, Longzhou, and Pingxiang of

Guangxi province (China) and Cat Ba National Park (Vietnam). According to IUCN Red list Categories and Criteria (IUCN 2012), *Spiradiclis spathulata* should be categorized as Vulnerable [VU, B1ac(iii)]. More information about the ecology of this species and the extent of the habitat in Vietnam and China regions is needed.

**Phenology:** Its flowering and fruiting period extends in June.

**Etymology:** The specific epithet refers to the leaf blade like a spatula in shape, with a rounded blade above gradually tapering to the base.

**Notes:** *Spiradiclis spathulata* is different from other *Spiradiclis* species in Vietnam by its somewhat short or hardly developed stems with leaves clustered at base, petiole 3 - 7 mm long, and corolla tube 17 - 25 mm long.

**Keys to *Spiradiclis* species in Vietnam**

1a. Short or hardly developed stems with leaves clustered at base, petiole 3 - 7 mm long, and corolla tube 17 - 25 mm long:... *Spiradiclis spathulata* X. X. Chen & C. C. Huang

1b. Stems developed with leaves borne at developed internodes, petiole ca. 20 mm long, and corolla tube 2 - 9 mm long.

2a. Capsules linearoblong to oblanceoloid, secondary leaf veins 6 - 7 pairs... *Spiradiclis caespitosa* Blume

2b. Capsules subglobose, secondary leaf veins 7-10 pairs.

3a. Corolla tube 6 - 7 mm long, leaf base acute... *Spiradiclis leptobotrya* (Drake) Pitard var. *longiflora* Merr.

3b. Corolla tube 2 - 6 mm long, leaf base cuneate and usually decurrent... *Spiradiclis leptobotrya* (Drake) Pitard

**4. CONCLUSION**

*Spiradiclis spathulata*, which was recorded as an endemic species to China, was discovered as a new record for the Flora of Vietnam. Based on the collections from Vietnam, detailed description and illustration of *S. spathulata* are provided. *Spiradiclis spathulata* is different from other *Spiradiclis* species in Vietnam by its somewhat short or hardly developed stems with leaves clustered at base, petiole 3 - 7 mm long, and corolla tube 17 - 25 mm long. According to IUCN Red list Categories and Criteria (IUCN 2012), *Spiradiclis spathulata* should be categorized as Vulnerable.

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**BỔ SUNG LOÀI *Spiradiclis spathulata* (RUBIACEAE)  
CHO HỆ THỰC VẬT VIỆT NAM**

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**TÓM TẮT**

Loài *Spiradiclis spathulata* được mô tả lần đầu tiên bởi X. X. Chen & C. C. Huang trong tạp chí Guihaia (13: 3. 1993) dựa trên các mẫu chuẩn chưa có quả chín và được ghi nhận là loài đặc hữu của Trung Quốc. Dựa trên các mẫu thu được tại Vườn Quốc gia Cát Bà, loài *Spiradiclis spathulata* (Lưỡng luân cát bà) đã được ghi nhận mới và bổ sung cho hệ thực vật Việt Nam. Những thông tin về mô tả, hình ảnh của loài dựa trên các mẫu thu tại Việt Nam đã được trình bày trong bài báo này. Loài Lưỡng luân cát bà khác với các loài khác trong chi *Spiradiclis* ở Việt Nam là có lá mọc tập chung trên một thân ngắn, gần sát đất, cuống lá dài 3 - 7 mm, phần ống tràng dài 17 - 25 mm. Một vài quần thể nhỏ của loài được phát hiện tại Ninh Minh, Long Châu, Bằng Tường thuộc tỉnh Quảng Tây, Trung Quốc và Vườn Quốc gia Cát Bà của Việt Nam. Tại Vườn Quốc gia Cát Bà *Spiradiclis spathulata* thường mọc rải rác ở khu vực gần Ao Ếch, trên các sườn núi đá vôi của rừng lá rộng thường xanh. Loài có thể sử dụng làm thuốc hoặc cây cảnh. Căn cứ vào Khung phân hạng của Danh lục đỏ IUCN năm 2012, nghiên cứu đã đề xuất thứ hạng bảo tồn loài là: Sẽ nguy cấp.

**Từ khóa:** Cát Bà, ghi nhận mới, Rubiaceae, *Spiradiclis spathulata*.

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