



Original Article

Phlogacanthus geoffrayi Benoist (Acanthaceae): A New Record to the Flora of Vietnam

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Abstract: *Phlogacanthus geoffrayi* is reported here as a newly recorded species from Vietnam. This species is morphologically allied to *Phlogacanthus turgidus* but differs in having a significantly bigger calyx and staminodes. The specimens were collected from Song Cau district of Phu Yen province. Description, line-drawing, photographs, and notes on ecology and distribution are provided.

Keywords: New record, Acanthaceae, *Phlogacanthus geoffrayi*, Phu Yen, Vietnam.

1. Introduction

The genus *Phlogacanthus* Nees belongs to the tribe Andrographideae of the family Acanthaceae [1,2]. It consists of about 40 species distributed in the tropical regions of Asia [2]. In Vietnam, the genus is represented by 11 species [3]. During a floristic exploration trip to Song Cau district of the Phu Yen province of Vietnam, an interesting species of *Phlogacanthus* was encountered. After thorough scrutiny of the available literature and type materials it was identified as *Phlogacanthus geoffrayi* Benoist [4-7]. This species was so far recorded only from

Cambodia but never from Vietnam [2,6,8-10]. Hence, it is reported here as a new addition for the flora of Vietnam. A detailed description, colour photos (Figure 1), and illustration (Figure 2) are provided here. With this addition, eleven species are recognized in *Phlogacanthus* for the flora of Vietnam.

2. Materials and Methods

2.1. Materials

Specimens of *Phlogacanthus* housed in the herbaria E, HN, HNU, IBSC, K, P, VNM were

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examined, and relevant literature were also consulted [8-10]. Morphological comparison of our specimen with allied species was carried out for confirming the identity of the plant. Vouchers were prepared following the standard protocol [11]. Specimens of *Phlogacanthus geoffrayi* were deposited in the herbarium of the Institute of Ecology and Biological Resources, VAST (HN).

2.2. Methods

The morphological comparison method was used to study the plants. It is one of the most suitable methods in plant taxonomic studies.

3. Results and Discussion

3.1. Key to the species of *Phlogacanthus* in Vietnam

- 1A. Corolla tube cylindrical and slightly curved.
 2A. Bracteoles leaf-like, ovate to ovate-lanceolate, > 12 mm long.
 3A. Corolla red, 3-3.5 cm long
 **1. *P. cornutus***
 3B. Corolla white with purple dotted stripes on throat, 1.5-1.8 cm long

 **2. *P. annamensis***
 2B. Bracteoles not leaf-like, linear or subulate, < 10 mm long.
 4A. Corolla light yellow or white, 2-2.5 cm long; filaments hirsute at base.

 **3. *P. pubiflorus***
 4B. Corolla purplish red, 4.5-5 cm long; filaments glabrous..... **4. *P. curviflorus***
 1B. Corolla tube abruptly inflated near middle and usually bent ca. 90°.
 5A. Corolla outside pubescent with gland-tipped trichomes.
 6A. Corolla white or light purple; leaf blade oblong to oblong-lanceolate; calyx 12-15 mm **5. *P. paniculatus***

- 6B. Corolla pale yellow with thin to dense purplish dots; leaf blade ovate to oblong; calyx 7-10 mm **6. *P. datii***
 5B. Corolla outside glabrous or non-glandular pubescent.
 7A. Bracteoles leaf-like, ovate to ovate-lanceolate, > 10 mm long.
 8A. Calyx > 10 mm, staminodes 4-5 mm long. **7. *P. geoffrayi***
 8B. Calyx < 7 mm, staminodes ca. 1 mm long. **8. *P. turgidus***
 7B. Bracteoles not leaf-like, linear, < 6 mm long.
 9A. Bracts leaf like, much longer than calyx; corolla glabrous outside **9. *P. pyramidalis***
 9B. Bracts small and not leaf like, subequal to calyx; corolla pubescent outside.
 10A. Leaf blade secondary veins ca. 6 on each side of midvein **10. *P. abbreviatus***
 10B. Leaf blade secondary veins 9-17 on each side of midvein **11. *P. colaniae***

3.2. Taxonomic treatment

***Phlogacanthus geoffrayi* Benoist – Hỏa rô geoffray** (Figure 1 & 2).

Benoist, 1928. Bull. Soc. Bot. France, 74: 910; Benoist, 1935. Fl. Gen. Indoch. 4: 706.

Shrubs 80 cm tall, erect. Stems quadrangular or slightly 4-angled, glabrescent. Petiole 2-4 mm; leaf blade lanceolate, 5-10 × 18-28 cm, glabrous on both side, base attenuate and decurrent onto petiole, margin entire or sinuate, apex acuminate to obtuse, secondary veins ca. 5-6 on each side of midvein. Inflorescences terminal racemes, 10-15 cm tall; bracts lanceolate, 12-15 × 4-5 mm, light purple, petiole very short, puberulent on both side; bracteoles very small, 1 mm long, or absent. Calyx ca. 10 mm, outside pubescent, lobes linear, ca. 8-9 × 1 mm, equal, apex acute. Corolla light purple, 2 cm long, ventricose, incurved, outside pubescent; tube basally ca. 2 mm wide and short then wide at middle; usually bent ca. 90° and

abruptly inflated near middle; limb 2-lipped; lower lip 3-lobed, lobes ovate and equal, middle lobes with the yellow patch; upper lip 2-lobed, lobes ovate with acute at apex; lobes ascending cochlear in bud. Stamens 2; filaments 10-12 mm, glabrescent and basally pilose; anther thecae oblong, 3-4 mm, connective barbate; staminodes filiform, 4-5 mm. Ovary 3-4 mm, oblong, glabrescent, with 4 ovules per locule; style ca. 15 mm, sparsely pubescent or glabrescent; stigma 2-cleft. Capsule clavate, 2.5-3 cm, pubescent, 8-seeded. Seeds ovate, compressed.

Loc. class.: Cambodia: Kampot, chaîne de l'Eléphant. **Type:** *C. Geoffray* 348 (holo.-P, photo!).

Flowering: March to May.

Ecology and habitat: Grows in the edge of the forest, along roadside.

Distribution: Cambodia, Vietnam (Phu Yen province, Song Cau district, Xuan Loc commune).

Specimens examined: VIETNAM, Phu Yen province, Song Cau district, Xuan Loc commune, N 13°39'41.3", E 109°10'52.0", D.V. Hai s.n. (HN).

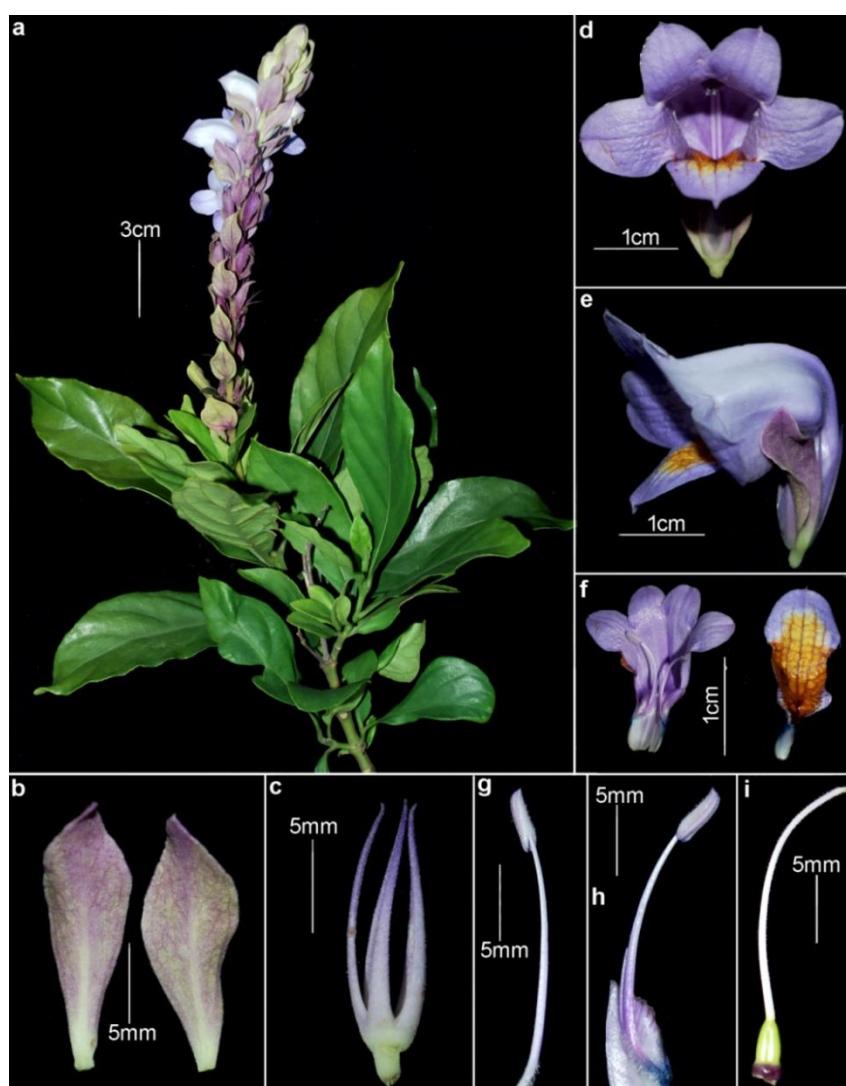


Figure 1. *Phlogacanthus geoffrayi* Benoist: a. Flowering and fruiting twig; b. Bracts; c. Calyx; d. Flower (front view); e. Bract, calyx and flower; f. Flower (opened); g-h. Stamens; i. Ovary and style (Photos by D.V. Hai).

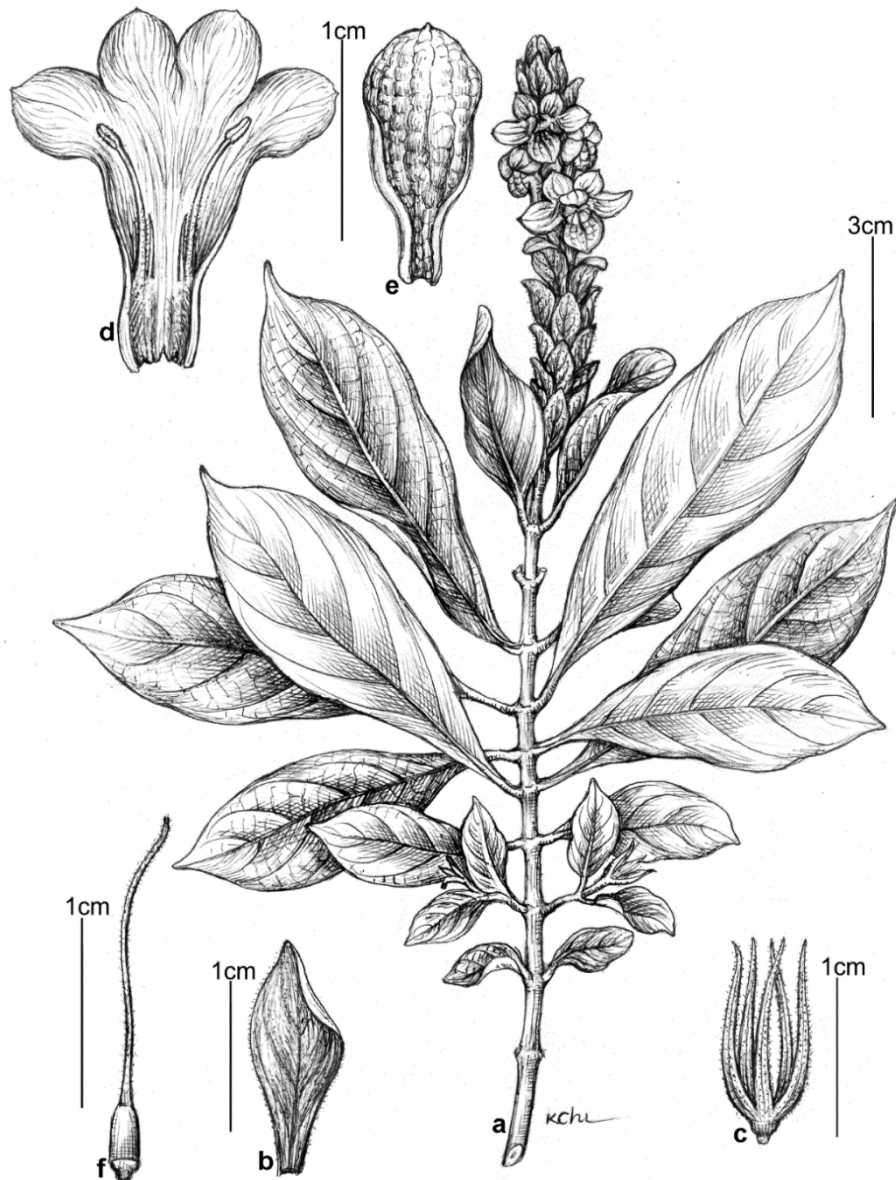


Figure 2. *Phlogacanthus geoffrayi* Benoist: a. Flowering twig; b. Bract; c. Calyx; d. Corolla (open) without lower middle lobe; e. Lower middle lobe; f. Ovary and style (Illustration drawn by Mrs Le Kim Chi, from D.V. Hai sine num., HN).

4. Conclusion

Understanding species diversity and distribution record are important for biodiversity assessment. An update to the available data facilitates effective analysis and interpretation of biodiversity and distribution data. Our research

for the first time reports occurrence of *Phlogacanthus geoffrayi* in Vietnam, a species hitherto known only from Cambodia. We believe this report will help to understand the Vietnam flora in a better way. At the same time, it will help to prioritize the conservation strategy for the country's valuable flora.

Table 1. Morphological comparison of *Phlogacanthus geoffrayi* with its allied species

Morphological characters	<i>P. geoffrayi</i>	<i>P. turgidus</i> [5,6]
Habit	shrubs, up to 80 cm tall	shrubs 0.5-3 m tall
Stems	quadrangular or slightly 4-angled, glabrescent	subterete and round on maturity, puberulent
Leaf	blade lanceolate, 5-10 × 18-28 cm, glabrous	blade lanceolate or oblong, 3-6 × 10-18 cm, glabrous
Inflorescence	racemes, 10-15 cm long	thyrses, 5-20 cm long
Bract	lanceolate, 12-15 × 4-5 mm	lanceolate, 12-14 × 5-6 mm
Bracteole	1 mm long or absent	oblong, ca. 10 × 3 mm, apex acute
Calyx	ca. 10 mm	4-7 mm
Corolla	light purple, ca. 2 cm long; lower lip 3-lobed, lobes ovate and equal, middle lobes with yellow patch	corolla white or pink, 2.5-3.5 cm long, lower lip 3-lobed, middle lobes with purple dots.
Fruits	2.5-3 cm long	3-4 cm long

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