

***Phaius baolocensis* sp. nov. (Orchidaceae), a new species endemic to the southern highlands of Vietnam**

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Nong V. D., Chen T. & Zhang D. 2012. — *Phaius baolocensis* sp. nov. (Orchidaceae), a new species endemic to the southern highlands of Vietnam. *Adansonia*, série 3, 34 (2): 251-255.
<http://dx.doi.org/10.5252/a2012n2a4>

ABSTRACT

A new endemic species, *Phaius baolocensis* N.V.Duy, T.Chen & D.X.Zhang, sp. nov. is described and illustrated. This new entity is similar to *Phaius tankervilleae* (Banks ex L'Hér.) Blume and *P. australis* var. *bernaysii* (F. Muller ex Bernays) Nicholls morphologically, from which it differs in having flowers rachis sparsely, lateral sepal narrow elliptic, petal narrow elliptic, lip apex bilobated, spur subcylindric and short.

KEY WORDS
Orchidaceae,
Vietnam,
new species.

RÉSUMÉ

Phaius baolocensis sp. nov. (Orchidaceae): une espèce nouvelle endémique du sud des régions montagneuses du Viêt Nam.

Une espèce nouvelle endémique, *Phaius baolocensis* N.V.Duy, T.Chen & D.X.Zhang, sp. nov. est décrite et illustrée dans cet article. La morphologie de cette nouvelle entité ressemble à *P. tankervilleae* (Banks ex L'Hér.) et *P. australis* var. *bernaysii* (F. Muller ex Bernays) Nicholls, mais en diffère par ses épis floraux dispersés, un sépale latéral étroitement elliptique, des pétales étroitement elliptiques, le bord des lèvres bilobé et un petit éperon subcylindrique.

MOTS CLÉS
Orchidaceae,
Vietnam,
espèce nouvelle.

INTRODUCTION

The genus *Phaius* was established by Loureiro (1790), with *Phaius grandiflorus* Lour. as generic type. It is allied to *Calanthe*, but may be distinguished by its free column and short or no-existent spur (Bechtel *et al.* 1981). According to the present account, *Phaius* consists of more than 40 species, mostly growing under moist broad-leaved forest or in forest swamps, most species being terrestrial with a few epiphytes. It is distributed from the tropical Africa to the Indian Subcontinent, Bhutan, China, throughout Southeast Asia to New Guinea, Australia and some Pacific islands (Lewis & Cribb 1989; Dockrill 1992; O'Byrne 1994; Chan *et al.* 1994; Cribb & Whistler 1996; Comber 2001; Pearce & Cribb 2002; Chen *et al.* 2009).

In Vietnam, the genus *Phaius* has been taxonomically studied by a few authors (Seidenfaden 1992; Tran Hop 1998; Pham 1999), and four species, namely, *P. flavus* (Blume) Lindl., *P. indigoferus* Hassk., *P. mishmensis* (Lindl. & Paxton) Reichb. and *P. tankervilleae* (Banks ex L'Hér.) Blume had been recognized while Averyanov & Averyanova (2003) recorded six species, *viz.*, *P. flavus* (Blume) Lindl., *P. indochinensis* Seidenf. & Ormerod, *P. mishmensis* (Lindl. & Paxton) Reichb., *P. longicornu* Guillaum, *P. longicuris* Tsi and *P. tankervilleae* (Banks ex L'Hér.) Blume.

In January 2011, during an expedition to Dang Rac Village, Di Linh Distr., Lam Dong Province, Southern highland Vietnam, we collected specimens in a private orchid garden of a peculiar flowering *Phaius* species, which the grower collected from the Bao Loc forest a few years ago (our efforts to relocate the population, however, was in vain). After having examined the specimens and consulted the relevant literatures (Bentham 1873; Hooker 1873; Mueller 1888; Seidenfaden 1986, 1992; Averyanov & Averyanova 2003; Chen *et al.* 2009), we found them to be similar to *Phaius tankervilleae* (Banks ex L'Hér.) Blume and *P. australis* var. *bernaysii* (F. Muller ex Bernays) Nicholls. However, detailed studies of this material revealed that these specimens are differentiated among other characters by rachis sparsely, lateral sepal narrow elliptic, petal narrow elliptic, lip apex bilobed, spur subcylindric and short (Table 1). These distinctive features are indicated that represent a hitherto undescribed species, which we name *Phaius baolocensis* sp. nov.

MATERIAL AND METHODS

Living plants of this species were collected from plants at Doan Chi Ly's orchid garden, 32 Dang Rac Village, Di Linh Distr, Lam Dong Province, Vietnam in January 2011. Fresh flowers were examined under an Olympus SX-41 light Microscope and color photographs were made using a Canon Power Shot SX10IS; line drawings and descriptions were made from fresh material. Presumably related species were used for critical comparison.

SYSTEMATICS

Family ORCHIDACEAE Juss.

Genus *Phaius* Lour.

Phaius baolocensis

N.V.Duy, T.Chen & D.X.Zhang, sp. nov.

(Figs 1; 2)

Species nova habitu Phaii tankervilleae (Banks ex L'Hér.) Blume similis, sed floribus viridiflavis, labiis interne flavis, apicis 2-lobatis et columnis candidis differt.

TYPUS. — **Vietnam.** Lam Dong Prov., Bao Loc District, 3.I.2011, *VTN 710* (holo-, VTN!; iso-, IBSC!, SZG!).

DISTRIBUTION, HABITAT AND PHENOLOGY. — This endemic species is only known from the type locality Bao Loc District, Lam Dong Province, Vietnam. It grows on wet mossy ground above shale, sandstone and granite under closed evergreen broad-leaved primitive forest, in shaded and damp places in forests, at forest margins, along valleys, or by the stream with high humidity; 800-1200 m a.s.l. Flowers December to March (in cultivation).

ETYMOLOGY. — The specific epithet refers to the type locality, Bao Loc, Lam Dong Province, Vietnam.

DESCRIPTION

Herbs, terrestrial, erect, 60-80 cm tall. Pseudobulb conic, ovoid, or subglobose, 7-8 cm long, 3-4 cm in diameter. Leaves 2-5, in the upper part of the pseudobulb; blade green, elliptic-lanceolate, 45-70 × 5-8 cm, glabrous, apex acute, with veins 3(-5) prominent clearly; petiole 15-20 cm long. Inflorescences produced from base of pseudo-

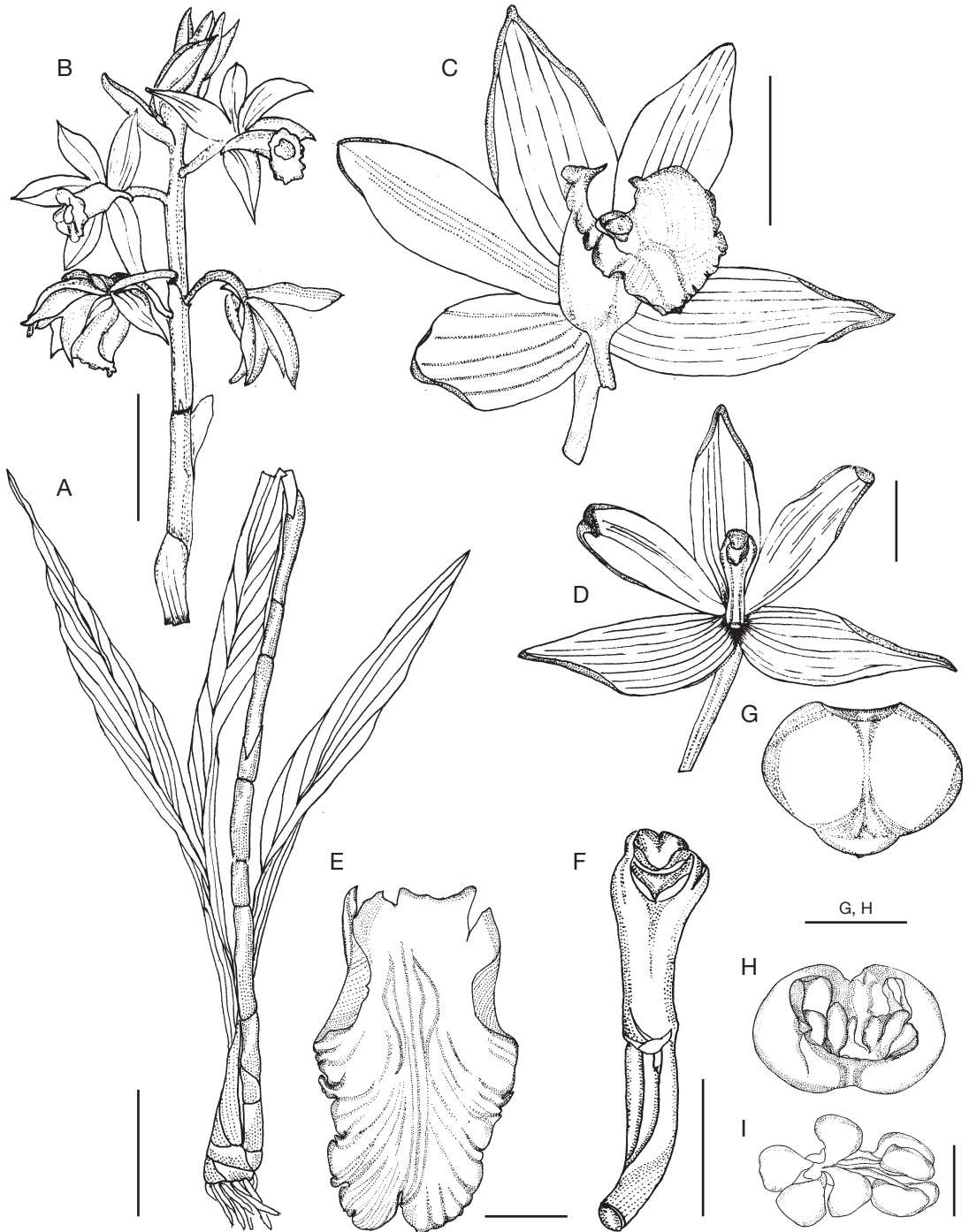


FIG. 1. — *Phaius baolocensis* N.V.Duy, T.Chen & D.X.Zhang, sp. nov.: **A**, habit; **B**, scape bearing flowers; **C**, flower front view; **D**, sepals and petals; **E**, lip; **F**, ovary and column; **G**, **H**, anther with pollinia inside; **I**, pollinia. Drawn from the holotype by T. V. Tran.

TABLE 1. — Diagnostic morphological characters of *Phaius baolocensis* N.V.Duy, T.Chen & D.X.Zhang, sp. nov., *Phaius tankervilleae* (Banks ex L'Hér.) Blume and *Phaius australis* var. *bernaysii* (F.Muller ex Bernays) Nicholls.

Taxa	<i>Phaius baolocensis</i> sp. nov.	<i>Phaius tankervilleae</i>	<i>P. australis</i> var. <i>bernaysii</i>
Pseudobulbs	7-8 × 3-4 cm	6-8 × 3-6 cm	5-7 × 5-7 cm
Leaves	elliptic-lanceolate, 45-70 × 5-8 cm	elliptic, 30-100 × 8-20 cm	pleated, 50-125 × 8-10 cm
Rhachis	sparsely, 10-15 flowers	10-20 or more flowers	flowers crowded
Dorsal sepals	oblong-lanceolate, apex acuminate, 5-5.5 × 1.8-1.9 cm	oblong-lanceolate, apex acuminate, c. 5 × 1.4 cm	ovate, apex hooded, 2.5-3.2 × c. 0.84 cm
Lateral sepals	narrowly elliptic, acute, 5.5-6 × c. 1.7 cm,	ovate-elliptic, acuminate c. 6.5 × 1.2 cm	lanceolate, 2.5-3.2 × c. 0.84 cm
Petals	narrowly elliptic, 4.5-5 × c. 1.5 cm	elliptic, 4-4.5 × 1.2-1.3 cm	lanceolate, 2.5-3.2 × c. 0.84 cm
Lip	broadly obovate, apex bilobed, 4-4.5 × c. 2.5 cm	broadly rhombic-ovate apex rounded, 3.5-4.3 × 1.2-2 cm	broadly obovate, apex apiculate or orbicular (shortly clawed), as long as the petals
Spur	subcylindric, slightly curved, 0.5-0.8 × c. 0.2 cm	hooked, narrow cylindric, 0.6-1 × c. 0.2 cm	conical, curved, ¼ the length of the lip
Column	spotlessly white, puberulent ventrally	whitely streaked with purple at the base, puberulent ventrally	yellow to white, puberulent on the front and back

bulb or axils of leaves, exceeding height of leaves, 60-100 cm tall, sparsely 10-15 flowered, glabrous; floral bracts usually caducous, lanceolate, 5-6.5 × 1.5-2.3 cm, glabrous. Flowers nutant, widely opening, large, 9-10 cm in diameter; pedicel and ovary 4-4.5 cm long, glabrous; sepals and petals white outside, yellowish green inside. Dorsal sepal, oblong-lanceolate, 5-5.5 × 1.8-1.9 cm, glabrous, apex acuminate; lateral sepals narrowly elliptic 5.5-6 × c. 1.7 cm, acute. Petals narrowly elliptic 4.5-5 × c. 1.5 cm; lip light yellow toward base with white stripes, white in middle and light yellow at margin toward entrance inside, 4-4.5 × c. 2.5 cm, broadly obovate, shallowly 3-lobed; lateral lobes nearly semicircular, c. 1.8 × 0.8 cm, and convolute, margin undulate and whitish yellow; mid-lobe longitudinally oblong, puberulent in the middle inside, margin undulate and striate, apex bilobed; spur slightly curved, yellowish white, subcylindric, 0.5-0.8 × c. 0.2 cm, apex slightly unequally bilobed. Column spotlessly white, 2-2.4 × c. 0.4 cm, puberulent ventrally; rostellum membraniform, triangular. Anther cap white, hemispheric, attenuate at the front, c. 4-5 mm wide; pollinia ovate, attenuate into the short stalk, slightly unequal in size, 1.2-1.8 × 0.8-1.2 mm.

REMARKS

The new species *Phaius baolocensis* sp. nov. is very similar to *Phaius tankervilleae* (Banks ex L'Hér.) Blume and *Phaius australis* var. *bernaysii* (F. Muller ex Bernays) Nicholls in morphological characters of pseudobulb, leaves and flower. However, it differs by having rachis sparsely, lateral sepal narrow elliptic, petal narrow elliptic, lip apex bilobed, spur subcylindric and short (Table 1).

Acknowledgements

This project was supported by the National Science Foundation of China (30970182, 30870367), Shenzhen Fairy Lake Botanical Garden Garnt (to Chen Tao 2008) and Tay Nguyen Institute of Biology, the Vietnam Academy of Sciences and Technology. We are in debted to Mr. Doan Chi Ly for supplying information and specimens. The curators of the herbaria (HN, HNU, IBSC, KUN, SYS, VNM) are thanked for their kind help in locating specimens. We also wish to thank Drs Marc Pignal and Valéry Malécot, and an anonymous reviewer for constructive comments and suggestions. Thanks also due to V. T. Tran for skillfully illustrating the species.

REFERENCES

- AVERYANOV L. V. & AVERYANOVA A. L. 2003. — *Updated Checklist of the Orchids of Vietnam*. Vietnam National University Publishing House, Hanoi, 102 p.
- BECHTEL H., CRIBB P., LAUNERT E. 1981. — *The Manual of Cultivated Orchid species*. Blandford Press, 361 p.
- BENTHAM G. 1873. — *Flora Australiensis: a description of the Plants of the Australian Territory*. The several Governments of the Australian Colonies, London 6: 305.
- CHAN C. L., LAM A., SHIM P. S. & WOOD J. J. 1994. — *Orchids of Borneo*. The Sabah Society and Royal Botanic Gardens, Kew 1: 224-231.
- CHEN X., LIU Z., ZHU G., LANG K., JI Z., LUO Y., JIN X., CRIBB P. J., WOOD J. J., GALE S. W., ORMEROD P., VERMEULEN J. J., WOOD H. P., CLAYTON D. & BELL A. 2009. — Orchidaceae, in WU Z., RAVEN P. H. & HONG D. (eds), *Flora of China*. Vol. 25. Science Press, Beijing; Missouri Botanical Garden Press, St. Louis: 290-292.
- COMBER J. B. 2001. — *Orchids of Sumatra*. Royal Botanic Gardens, Kew: 281-289.
- CRIBB P. J. & WHISTLER W. A. 1996. — *Orchids of Samoa*. Royal Botanic Gardens, Kew: 53-56.
- DOCKRILL A. W. 1992. — Australian Indigenous Orchids revised version. *Surrey Beatty & Sons. Sydney, NSW* 1: 288-301.
- HOOKE J. D. 1873. — *The Plants of the Royal Gardens of Kew and the Other Botanical Establishments in Great Britain, with Suitable Descriptions*. Botanical Magazine 99: t. 6032.
- LEWIS B. & CRIBB P. 1989. — *Orchids of Vanuatu*. Royal Botanic Gardens, Kew: 53-55.
- LOUREIRO J. DE 1790. — *Flora Cochinchinensis*. Lisbon 2: 529-530.
- MULLER F. 1888. — *Fragmenta Phytographiae Australis*. Missouri Botanic Garden Library 1: 42.
- O'BYRNE P. 1994. — *Lowland Orchids of Papua New Guinea*. SNP Publishers Pte Ltd., Singapore 51-53, Plate 205.
- PEARCE N. R. & CRIBB P. J. 2002. — *The Orchids of Bhutan*. Royal Botanic Garden, Edinburgh and Royal Government of Bhutan, 3 (3): 302-306.
- PHAM H. H. 1999. — *An Illustrated Flora of Vietnam*. Youth Publish House, 3: 869.
- SEIDENFADEN G. 1986. — *Phaius tankervilleae*. *Opera Botanica* 89.
- SEIDENFADEN G. 1992. — The Orchids of Indochina. *Opera Botanica* 114: 99-101.
- TRAN H. 1998. — *The Orchids of Vietnam*. Agricultural Publish House: 473-476.

Submitted on 26 September 2011;
accepted on 13 January 2012.