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Caulokaempferia pubescens (Zingiberaceae) - A New Species from Northern Thailand

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ABSTRACT: A new species of *Caulokaempferia* K. Larsen (Zingiberaceae), *C. pubescens* Picheans. & Phokham, from Changwat Mae Hong Son in Northern Thailand is reported. Full descriptions, together with ink line–drawing with water color and photographic illustrations are given. Relationship of this new species with their phylogenetically closest related taxa, *C. larsenii* Suksathan & Triboun, is also discussed.

KEY WORDS: *Caulokaempferia*, *Caulokaemferia pubescens*, northern Thailand, Zingiberaceae.

INTRODUCTION

The genus *Caulokaempferia* K. Larsen (Zingiberaceae) was established by K. Larsen (1964). It comprises about 30 species, distributed from the Himalayas (3 species) through south China (2 species), Vietnam (2 species), Laos (5 species) and Thailand, with its centre of diversity in Thailand (Chaiyoot, 2007). So far, however, none has been reported from Myanmar and Cambodia.

A few taxa of the genus were reported to be ethnomedically important. In Thailand, *C. phutokensis* Picheans. & Koonterm is used by Thai forest monks to treat early stage of prostatic hyperplasia (Picheansoonthon & Koonterm, 2008), while *C. linearis* (Wall.) K. Larsen is used by the Chakmas in India and Bangladesh for treating vertigo (Rai & Lalramnghinglova, 2010).

In Thailand, 2 species, *C. saxicola* K. Larsen and *C. kuapii* K. Larsen, were included in K. Larsen's original treatment of the genus (1964). Since then, 16 taxa were further recognized (Chaiyoot, 2007). In the past few years, *C. sirirugsae* Ngamriab. (Ngamriabsakul, 2008) from southern Thailand and *C. chayaniana* Tiyaw. (Tiyaworanant, 2010) from northern Thailand, were further added.

In this paper, a new species from Changwat Mae Hong Son in northern Thailand, *C. pubescens* Picheans. & Phokham, is described with full description and color illustrations. Relationship with its closely related taxon, *C. larsenii* Suksathan & Triboun (Suksathan & Triboun, 2004) will be discussed.

TAXONOMIC TREATMENT

Caulokaempferia pubescens Picheans. & Phokham, ***sp. nov.*** Figures 1,2

Type: **THAILAND**: Changwat Mae Hong Son, Amphoe Mueang Mae Hong Son, altitude 1,407 m, 13 July 2013, *CP 130713-3* (holotype BK).

This new species is similar to *Caulokaempferia larsenii*, but differs in the following characters: shorter and sparsely–hairly ligule, pubescent lower leaf-surface, broadly ovate to orbicular anther crest, style insertion between anther sac, and stigma with raised ends.

Perennial herbs, slender, with short rhizome; root fibrous, some form longish tuber. Pseudostems erect, 10.5–36.5 cm with 3–7 bladeless sheaths. Leaves (3–)4–6(–10), sessile, elliptic to narrowly ovate, 4.5–10.5 by 1.5–4.1 cm, base cuneate to rounded, apex acuminate to caudate to 1.5 cm long, upper surface glabrous, lower surface pubescent; ligule membranous, 3–7 mm long, sparsely hairy at base, apex rounded. Inflorescences terminal; peduncle, 3.5.–7.5 cm long, hidden in the uppermost two leaf sheaths; flowers entirely yellow. Bracts (3–)4–8(–9), green, broadly elliptic to ovate–oblong, 2.9–3.6 by 1–1.2 cm, apex acute to acute–acuminate, margin translucent, each subtends 1–3(–4) flowers, some lower bract with leaf-like appendage. Bracteoles membranous, elliptic to ovate–oblong, 5–10 by 2.5–5 mm, translucent with prominent greenish midvein, apex acute to obtuse, glabrous. Calyx tubular, 1.1–1.5 cm by 3–4 mm, translucent, split down one side to about half way, apex

Fig. 1. *Caulokaempferia pubescens* Picheans. & Phokham. A: Habit. B, C: Leaf base, showing ligule (B. side view and C. front view). D: Inflorescence, showing a flower and fruits. E: Bract. F–H: Bracteoles. I: Calyx tube. J–L: Corolla lobes (J. Dorsal, K. and L. Lateral). M, N: Lateral staminodes. O: Labellum. P: Ovary and stylodes with rear view and side view. Q, R: Anthers and anther crests (Q. rear view and R. front view). [drawn by Chalermchoke Boonchit]

bilobed. Corolla tube 3.3–4.2 cm by ca. 3 mm, glabrous; dorsal corolla lobe oblong, 1.1–1.7 cm by 5–8 mm, apex obtuse to apiculate, hooded; lateral corolla lobes oblong, 1.2–2 cm by 6–8 mm, apex acute. Staminodes broadly elliptic to obovate, 1.2–1.7 by 0.7–1.1 cm, apex rounded. Labellum orbicular, 3.4–4.5 by 3.7–4.8 cm, margin undulate, apex rounded; anther, 4–6 mm long; anther crest broadly ovate to orbicular, 5–7 mm diameter, apex rounded, reflexed. Stigma funnel-shaped, inserted between anther sac, margin raised on both ends, ciliate. Ovary oblong, 6–8 by 2–3 mm, glabrous, 1–locular, ovules numerous; stylodes 2, filiform, ca. 1 mm long. Fruits fleshy capsule, oblong to elliptic, 1.2–2 cm by 4–5 mm, green, split on one side. Seeds numerous, obovate, *ca*. 2 by 1 mm, crown with whitish arillode. Flowering June–August; fruiting July–September.

Distribution: Thailand, Mae Hong Son province, Amphoe Mueang Mae Hong Son, Doi Pa Yee, known

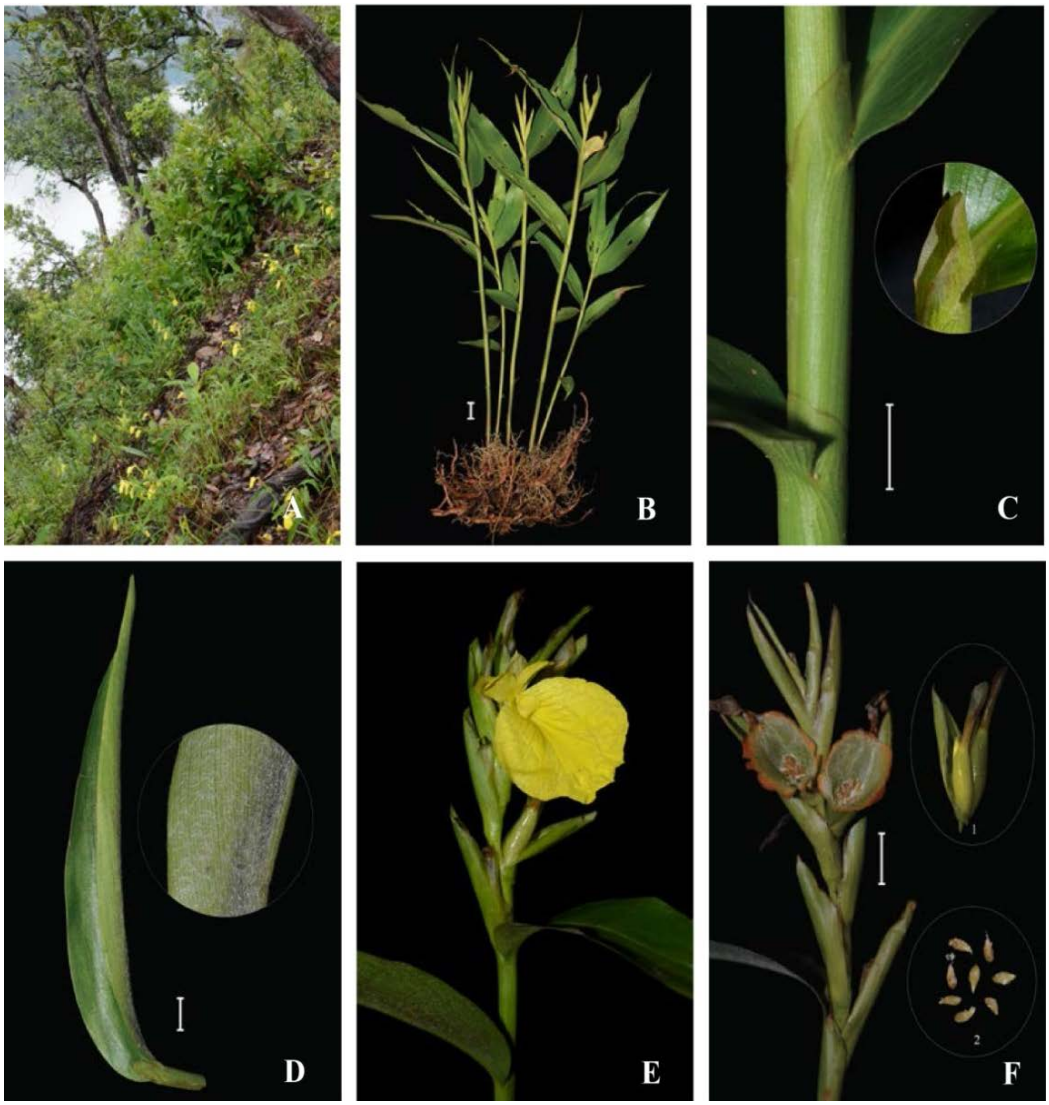

Fig. 2. *Caulokaempferia pubescens* Picheans. & Phokham. A: The plants in its type location. B: Plant habit. C: Part of a pseudostem and lower part of leaves, showing ligules. D: A leaf, showing leaf surfaces (upper surface glabrous and lower surface pubescent). E: An inflorescence, showing detail of a flower and bract arrangement. F: An infructescence, showing dehiscing fruits and seeds, fruits (1) and seeds (2). Scale = 1 cm. [photographed by *Chayan Picheansoonthon*]

only from the type locality.

Ecology: This new species grows on sandstone rocks slopped under the shade of lower montane pine-oak forest, at the altitude of 1,350–1,450 m.

Note: This new species can be easily characterized by its terrestrial habit, short ligule and pubescent lower leaf–surface. The hairiness of the lower leaf-surface has, so far, not been observed in the genus *Caulokaempferia*.

This new taxon is morphologically similar to *Caulokaempferia larsenii*, but differed in several characters as mentioned earlier. From investigation of living specimens of *C. larsenii* and *C. pubescens* in their type locations, both species are morphologically distinct. The pistil of *C. larsenii* is "shorter than the stamen' and 'not inserted between anther sac' (Suksathan & Triboun, 2004). This character is rather unique for the genus. However, the pistil of *C. pubescens*, similar to all other known *Caulokaempferia*s, is longer than the stamen, and the style inserted between the anther sacs.

The type location of this new taxon is in the same mountain range and only less than 20 kilometers away from the type locality of *C. amplexicaulis* Suksathan (Larsen *et al*, 2003). The latter species is, however, morphologically different, particularly in its amplexicaul leaves and bracts with fused leaf-sheaths. It is worth mentioning that in this type locality, a month after this new taxon is in full bloom, *C. saxicola* K. Larsen starts appearing on the moist rock surfaces or

rock crevices facing the valley. This latter species is rather common in high–altitude mountains in Northern Thailand.

Also, on the opposite side of the valley not far away from type locations of both *C. pubescens* and *C. amplexicaulis*, another taxon, *C. chayaniana* Tiyaw., was recently reported. However, *C chayaniana*, in contrast with *C. amplexicaulis*, pocesses amplexicaul leaves, but with open leaf–sheaths (Tiyaworanant, 2010).

Molecular study of all members of the genus which is part of the first author's Ph.D. dissertation, also supports that *C. pubescens* is a phylogenetically distinct taxon, and closest to *C. larsenii*. The result will be published in the forthcoming publication.

Note on generic nomenclature

In 1964, Kai Larsen established the genus *Caulokaempferia*, rejecting *Monolophus* Wall. for both taxonomic and nomenclatural reasons (Larsen, 1964). Since then, all the authors of this plant group (particularly local botanists who worked in the distribution areas from China, Vietnam, Laos, Thailand, Bhutan to India) have accepted his determination, and have used the name (*Caulokaempferia* K. Larsen) in their taxonomic treatments, including the treatments of some 20 new taxa and local floras.

Recently, the name *Caulokaempferia* K. Larsen was proposed to be superfluous, and the name *Monolophus* Wall. was restated based on chronicle literature evaluation (Mood *et al*, 2014). However, their judgement needed to be further debates. Detailed discussion on this nomenclatural controversy was and will be published (Intharapichai, 2015, Picheansoonthon, 2015) in other publications.

Realizing this technical problem, in our treatment of the genus for Vietnam, the name '*Caulokaempferia* K. Larsen' is proposed as conserved name (*nom. cons.*) (Intharapichai *et al*, 2014). Therefore, it would be inappropriate to put the names of more than 20 plant taxa into a synonymous just because of this technical problem. And, it would be practically unacceptable to *place the authorship of the persons who hardly knew, or* seen most members of the genus (Mood *et al*, 2014). We, therefore, treat the genus under the accepted name *Caulokaempferia* K. Larsen.

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