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A New Species of *Kaempferia* L. (Zingiberaceae) from Northeastern Thailand

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ABSTACT: *Kaempferia sisaketensis* (Zingiberaceae), a new species from Northeastern Thailand, is described and illustrated. This new taxon can be easily recognized by its 2-4 elliptic and glabrous leaves, pink to violet flowers with the deeplybilobed labella, and the absence of the staminodes. Relationship with its closely related taxa, *K. spoliata* Sirirugsa and *K. chayanii* Koonterm, is also discussed.

KEY WORDS: new species, *Kaempferia sisaketensis*, Zingiberaceae, Northeastern Thailand.

INTRODUCTION

The genus *Kaempferia* L. (Zingiberaceae) is one of the important medicinal plant groups in Thailand. Many taxa are known locally for their medicinal properties, *K. angustifolia* Rosc., *K. galanga* L., *K. marginata* Carey, *K. parviflora* Wall. ex Baker, *K. rotunda* L., to mention a few. Taxonomic studies on this plant group are essential to set up the baseline information for other related research, especially in drug development.

It is a medium-sized genus with approximately 50 species, mostly distributed from India, South China, to Malesia (Mabberley, 1993). Fifteen taxa were previously accounted for Thailand (Sirirugsa, 1992). Since then, *K. pulchra* Ridl., was reported conspecific to *K. elegan* Wall. ex Baker (Searle, 1999), a new Thai record, *K. candida* Wall. (Jenjittikul and Larsen, 2000), was added, and a new species, *K. grandifolia* Saensouk & Jenjitt. (Saensouk and Jenjittikul, 2001) was recognized. More recently, taxonomic and ethnobotanical note on the genus *Kaempferia* L. in Thailand was discussed in details (Picheansoonthon and Koonterm, 2008).

Among the sixteen taxa known for Thailand, the rare and endemic *K. spoliata* Sirirugsa is unique, and can be easily distinguished. It is the only species with all the key characters of the genus *Kaempferia* L., but the two staminodes are absent. In this paper, the second species with the same characteristic features is recognized, and the relationship between these two taxa, together with another closely related taxon, *K. chayanii* Koonterm, is discussed.

TAXONOMIC TREATMENTS

Kaempferia sisaketensis Picheans. & Koonterm, sp. nov. Figs. 1 & 2

Type: *Picheansoonthon & Koonterm 74*, Phalan Doen Tia, Changwat Si Sa Ket, Thailand, N 14° 28.894' E 104°36.764', alt. 169 m, 8 June 2007 (holotype BKF, isotype BK, SING).

Kaempferiae spoliatae similis, foliis 2 vel 3 (vel 4), petiolo ad 1.2 cm longo, lamina oblanceolata ad elliptica, apice acuto, utrinque glabra, ligula biloba, inflorescentia subsessili, pedunculo ad 6 mm longo, bracteis oblongis, calycis tubi apice rotundato, labello roseo ad violasceo, margine crenata differt.

Perennial herb, rhizome short, bearing several roots in a fascicle. Leaves 2-3(4), radical, petiole upto 1.2 cm long; blade oblanceolate to elliptic, 9.6-21.3 by 2.3-4.0 cm, apex acute, base cuneate, both surface glabrous; leaf-sheaths 4.2-8.7 cm long, the margin membranous, glabrous; bladeless sheaths 4.8-9.1 cm long; ligule bilobed, membranous, glabrous, 2-6 mm long. Inflorescence rising between the two innermost leaves, peduncle up to 6 mm long. Flowers several; bracts oblong, 4.8-13.8 by 0.6-1.6 cm, glabrous, apex acute to acuminate; bracteoles linear, folded, glabrous, 3-5.5 cm long, apex acuminate. Calyx tubular, glabrous, 3.7- 5.3 cm long, divided along one side, apex rounded. Corolla tube slender, 7.9-12.3 cm long; corolla lobes white, oblong; dorsal corolla lobe 2.3-2.8 by 0.4-0.5 cm, apex hooded; lateral corolla lobes 2.3-2.6 by *ca.* 0.4 cm, apex hooded, mucronate or blunt. Staminodes absent. Labellum pinkish to violet, divided to the base, each lobe

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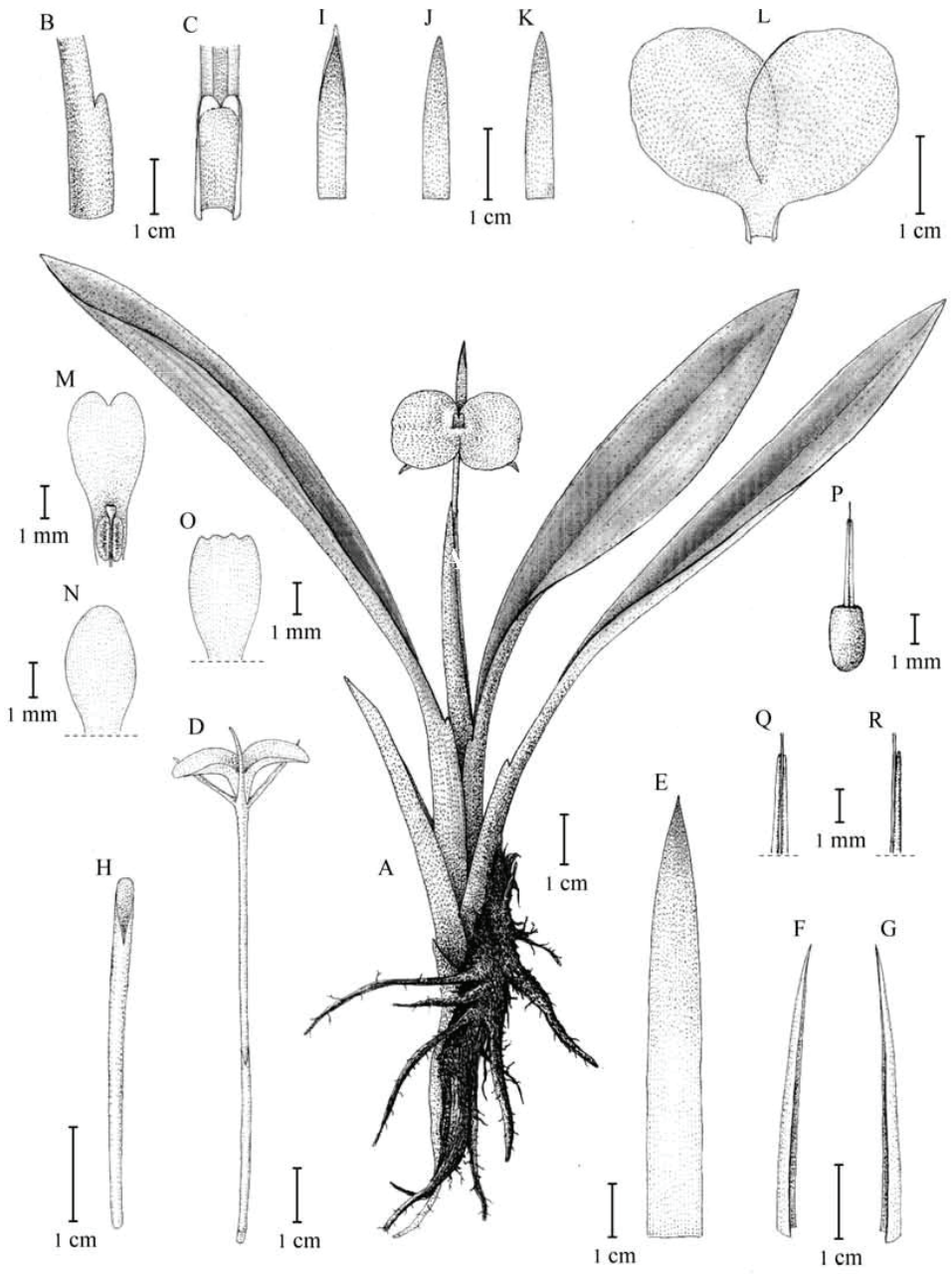


Fig. 1. *Kaempferia sisaketensis* Picheans. & Koonterm. A: Habit. B, C: Ligule. D: A flower (side view). E: Bracts. F, G: Bracteoles. H: Calyx tube. I: Dorsal corolla lobe. J, K: Lateral corolla lobes. L: Labellum. M, N, O: Anthers, stigma, and various forms of anther crests. P, Q, R: Ovary with part of the style, and the stylodes. Drawn by Chalermchoke Boonchit.

obovate or sub- orbicular, 1.4-2.2 by 1.2-2.5 cm, margin crenate. Stamen with very short filament; anther *ca.* 4 mm long, anther-crest oblong, 5-8 mm long, apex entire, rounded, or irregularly toothed. Ovary cylindrical, *ca.* 4 x 2 mm, glabrous, 3-locular, placentation axile, ovules many; stylodes 2, filiform, *ca.* 4 mm long.

Distribution: This new species is so far known only from the type locality in Changwat Si Sa Ket in Northeastern Thailand.

Ecology: This new species grows on moist sandstone rocks under the shade of mixed deciduous forests, at the altitude of *ca.* 164 m. It is one of the dominant species of the special type of seasonal wetland vegetation called "blanket marsh vegetation" only appearing in the rainy season.

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Fig. 2. *K. sisaketensis* Picheans. & Koonterm. A: The plant in the type location. B: An inflorescence with two flowers blooming, showing lower part of the leaves and the bract. C: Top view of the flowers, showing the corolla lobes, the labella, and the anther crests. Photographed by S. Koonterm (A) and C. Picheansoonthon (B & C).

Vernacular Names: Pro Hu Kratai (เปราะหูกระต่าย), Rejek Muxai (ระจีกมีไซ-เขมรศรีสะเกษ).

Uses: The roots and rhizomes of this new taxon are used medicinally by local Khmer healers. The cooked young leaves are eaten with chili dipping by the local in the villages around the type location.

Note: Most of theThai *Kaempferia* species are low herbs with either white or violet/purplish flowers, or the combination of both color, and the deeply divides labella. In all Thai taxa, except *K. spoliata* Sirirugsa, the staminodes are large and showy. However, the staminodes are absent in the case of *K. spoliata* Sirirugsa which make the species unique for the genus. Before our report of *K. sisaketensis*, it is the only taxa of the genus known with this character.

Kaempferia spoliata Sirirugsa (Fig. 3) was described from the specimen collected from the Phanom Dongrak Range in Changwat Si Sa Ket of Thailand, closed to the Thai-Cambodian border (Sirirugsa, 1989). *Kaempferia sisaketensis* Picheans. & Koonterm was also discovered in the limited areas in this same mountain range. It can be readily distinguished from *K. spoliata* Sirirugsa in many key characters as shown in Table 1.

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Fig. 3. *Kaempferia spoliata* Sirirugsa. A: Isotype (BKF). B: White flowers showing corolla lobes, labella, and anther crests. Photographed by S. Koonterm (A) and C. Picheansoonthon (B).



Fig. 4. *Kaempferia chayanii* Koonterm. The flowering plant, showing the two leaves and the flower. Photographed by S. Koonterm.

The number, shape, and surface of the leaves of this new taxon are the key differences. From field observation, the color of the labella of *K. spoliata* Sirirugsa are always white, while those of *K. sisaketensis* Picheans. & Koonterm are always pinkish to violet, generally with white patches at the bases. However, the anther crests of both species are similar and variable. From our experiences in field observation, we found out that variations in shapes and sizes of the anther crests are common in the Thai *Kaempferia*. And in most cases, these characters can not be used for species differentiation.

It is worth to note that *K. sisaketensis* starts blooming in as early as early June, the time of which *K. spoliata* just about to start growing from its dormancy. By the time *K. spoliata* flowered in as early as end of July, all *K. sisaketensis* are in their fruiting or seed dispersal stages.

In southern Laos, not far away from the type location of this new taxon, another species, *K. chayanii* Koonterm (Fig. 4), was described (Koonterm, 2008). It may probably be phylogenetically related to *K. sisaketensis*. Although the staminodes of *K. chayanii* are present, but their size is much reduced, compared with other *Kaempferis* species. However, all the three taxa, *K. spoliata*, *K. sisaketensis*, and *K. chayanii*, have the similar habit and habitat. Molecular studies on these species will be performed. The result of which will be reported in the forthcoming publications.

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Table 1. Character differences between *Kaempferia spoliata* and *K. sisaketensis*.

Characters	*K. spoliata*	*K. sisaketensis*
1. Leaves		
number	5-7	2-3(-4)
shape	linear	oblanceolate to elliptic
surface	upper surface glabrous, lower surface villous	both surfaces glabrous
petiole	- (sessile leaves)	upto 1.2 cm long
ligule	triangular, 1-2 mm	bilobed, apex of each lobe obtuse, 1-6 mm
2. Inflorescence		
peduncle	-	upto 6 mm long
shape of bracts	lanceolate	oblong
3. Flowers		
apex of calyx tube	bifid	rounded
labellum	white, margin undulate	pink to violet, margin crenate

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泰國東北的薑科新種植物：*Kaempferia sisaketensis*

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摘要：本文就分布於泰國東北邊的山奈屬 (薑科) 新種－*Kaempferia sisaketensis* Picheans. & Koonterm 提供描述及圖片。此一新種可以藉由二至四片橢圓形、無毛的葉片，粉紅至紫色的花，深裂的唇瓣，及假雄蕊缺如等特徵，易於與其他相近分類群鑑別，相近種 *K. spoliata* Sirirugsa 及 *K. chayanii* Koonterm 亦在本文中一併予以討論。

關鍵詞：新種、*Kaempferia sisaketensis*、薑科、泰國東北 (伊善地區)。

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