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RESEARCH ARTICLE

Further Study on the *Elettariopsis* Baker (Zingiberaceae) in Thailand－a New Species and a New Record

Chayan Picheansoonthon[1,2*] and Piyapong Yupparach[2]

1. The Academy of Science, The Royal Institute of Thailand, Sanam Suea Pa, Sriayudhaya Road, Khet Dusit, Bangkok 10300, Thailand.
2. Pharmaceutical Botany and Pharmacognosy Research Unit, Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen 40002, Thailand.
** Corresponding author. Email: chayan@kku.ac.th*

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ABSTRACT: Six taxa of *Elettariopsis* Baker (Zingiberaceae) were previously accounted for Thailand. In this paper, *E. wandokthong*, a new species from Thailand, is described and illustrated. Also, the distribution of *E. monophylla* (Gagnep.) Loes. in Thailand is reported here for the first time with full description and illustration. Key to species currently enumerated for Thailand is also provided.

KEY WORDS: Zingiberaceae, Thailand, *Elettariopsis wandokthong*, new species, *Elettariopsis monophylla*, new record.

INTRODUCTION

In continuation of our taxonomic studies on the medicinal plant family Zingiberaceae with the main objective to set up the baseline information for other related research, especially drug development, we have extended our work to several genera within the family, i.e. *Caulokaempferia* K. Larsen, *Hedychium* J. König, *Kaempferia* L., *Hemiorchis* Kurz, to mention a few. These affords have led to clarification of some previously taxonomically-unknown medicinal plants in this family.

The genus *Elettariopsis* Baker is one of the least known plant groups in the family Zingiberaceae, not only for Thailand, but also for the rest of its distribution range. From our intensive field works throughout Thailand and Laos, and from herbarium investigation of the genus *Elettariopsis* collected from Thailand, Laos, Peninsular Malaysia and Singapore in major hebaria, 6 species are currently enumerated for Thailand: *E. chayaniana* Yupparach, *E. elan* C. K. Lim, *E. exserta* (Scort.) Baker, *E. slahmong* C.K. Lim, *E. smithiae* Y.K. Kam, and *E. triloba* (Gagnep.) Loes. (Picheansoonthon and Yupparach, 2007; Yupparach, 2008). Taxonomic history, including information on ethnobotany, chemical constituents, and biological activities of some members the genus was recently discussed (Picheansoonthon and Yupparach, 2007).

An ethnobotanically important taxon in Thailand, known by the locals as "Wan Dokthong", is recognized here as a new species. The relationship with other closely related taxa is discussed. In addition, the presence of *E. monophylla* (Gagnep.) Loes. in Thailand is reported here for the first time with full description and illustrations. Key to all species currently known for Thailand is provided.

TAXONOMIC TREATMENTS

Elettariopsis wandokthong Picheans. & Yupparach**,** *sp. nov.* Figs. 1 & 2

Type: Thailand, Changwat Prachin Buri, Amphoe Mueang Prachin Buri, Pang Sida National Park, elevation 62-240 m, 8 January 2006, *Picheansoonthon & Yupparach* 037 (holotype: BKF, isotypes: BK and SING).

Diagnose: Elettariopsidi trilobae similis, foliis 2-4 lanceolatis ad oblongis vel ellipticis utrinque glabris, ligula 1-2 mm longa pubescenti, apice bilobo, calycis tubo corollae tubo longiore pubescenti, ovario pubescenti differt.

Perennial herbs, slender, 28.6-33.8 cm; rhizome creeping, slender, bearing pseudostem at intervals. Bladeless leaf 1-2. Normal leaves 2-4; ligule 1-2 mm long, apex bilobed, pubescent; petiole 9.1-18.3 cm long, glabrous, channeled; leaf blade lanceolate-oblong or elliptic, 21.6-29.7 x 3.9-5.3 cm, apex acuminate to shortly caudate, base attenuate, margin entire to slightly undulate, both sides glabrous, lower surface green;. Inflorescence arising from the base of pseudostems, with flowers in an erect dense head, peduncle 0.6-1.2 cm long. Bracts 6-8, ovate-lanceolate, light pinkish, 1.7-2.6 x 0.7-1.5 cm. Bracteole lanceolate, 1.3-1.85 cm x 2.5-3.5 mm. Calyx tubular, 2.9-4.45 cm long, usually 0.9-1.4 cm longer than corollatube, pinkish to reddish,

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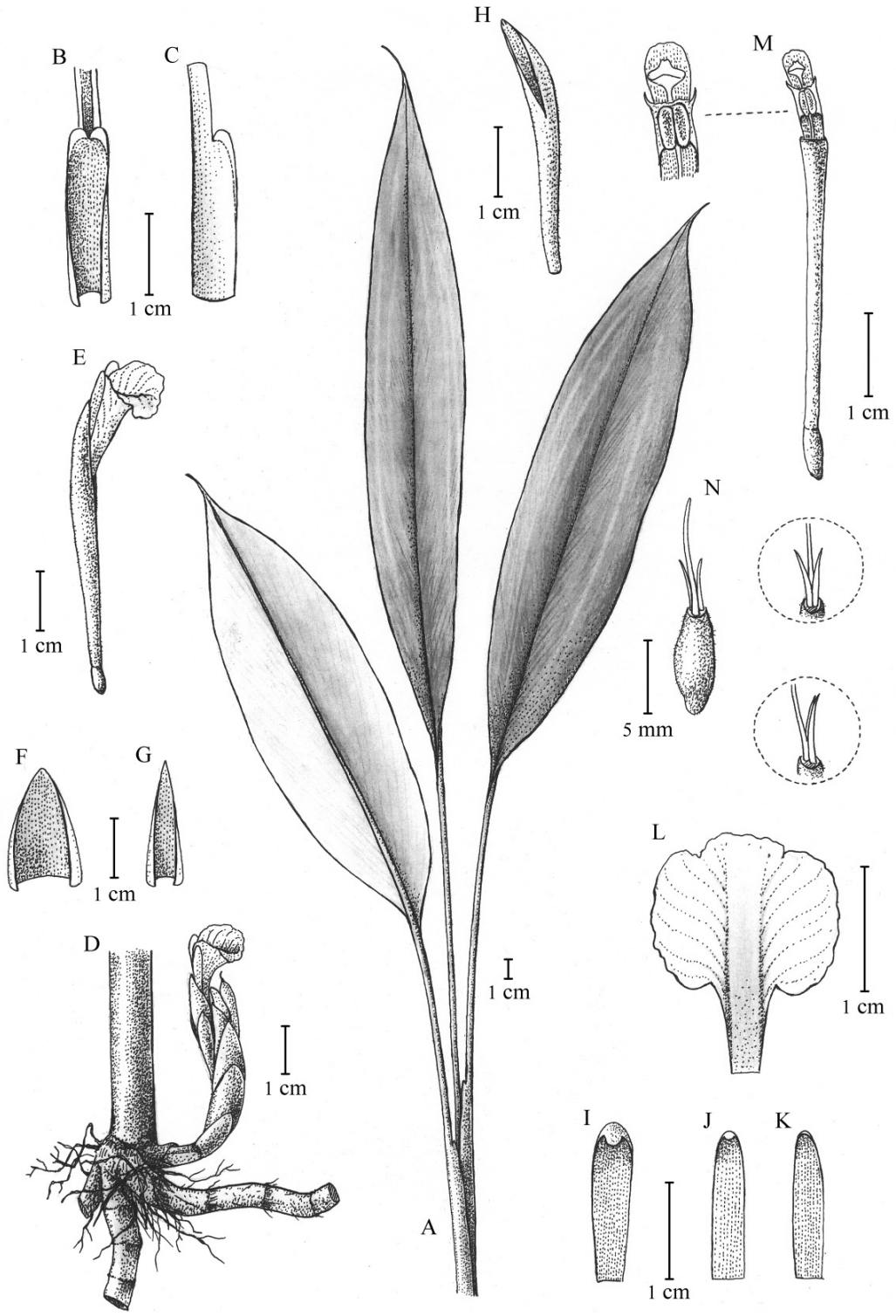


Fig. 1. ***Elettariopsis wandokthong*** **Picheans. & Yupparach. A: Upper portion of the plant showing leaves. B, C: Lower part of a leaf showing a ligule (B. front view and C. side view). D: Lower portion of the plant showing rhizomes, roots, and an inflorescence. E: A flower. F: Bract. G: Bracteole. H: Calyx tube. I: Dorsal corolla lobe. J, K: Lateral corolla lobes. L: A labellum. M: Part of a flower showing ovary, corolla tube, anther and anther crest, style and stigma. N: Ovary with stylodial glands and lower part of the style. (Drawn by Chalermchoke Boonchit)**

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Fig. 2. *Elettariopsis wandokthong* Picheans. & Yupparach. A: Showing an oblique view of a flower. B: Showing a labellum and an anther crest. C: Showing a top view of a flower. D: Growing in a pot by a street vender. (Photographed by Chayan Picheansoonthon)

pubescent, apex bilobe. Collora tube slender, 1.5-3.55 cm long, white with yellowish apex; lobes 3, yellowish; dorsal lobe oblong, 1.5-1.8 cm x 5-6 mm, hooded; lateral lobes oblong, 1.25-1.6 cm x 2-4 mm, slightly hooded. Lateral staminodes absent. Labellum suborbicular, 1.2-2.1 x 1.2-1.8 cm, white with reddish base and yellow band in the middle, hairy towards the throat; base clawed, 5-8 mm; distal part 3-lobe, the median lobe crenate, sometimes slightly emarginate. Filament short, 2-5 x 2-3 mm, pinkish. Anther 4-5 x 2-3 mm; connective appendage, 3-5 x 2-3 mm, apex obtuse, with a small (ca. 1 mm long) tooth-like lobes at the base on each side. Ovary 2-5 x 2-4 mm, pubescent, stylodes 2, slender, 5-6 by ca. 1 mm, not surrounding the style. Fruits not seen.

Phenology: Flowering in January-April.

Distribution: This new species can only be found in the type location. However, it is widely cultivated in Thailand.

Ecology: The new species grows under the shade of dried deciduous forest, at the altitude of 62-240 m.

Vernacular names: Wan Dokthong (ว่านดอกทอง), Wan Maha Saneh (ว่านมหาเสน่ห์), 彎斗松擬苣蔂 (Chinese new name).

Ethnobotany: This new taxon is believed to process a magical power, and therefore, it is used as a good-luck charm. The Thai names imply magical seductive power. The plants are grew in pots, and put in front of shops believing that they will help attracting customers, especially when the plant is in bloom (usually as early

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as January to early May). The rhizomes of this taxon are also used as one of the ingredients for making "magical herbal charming oil" or "magical charming lip balm", believing that after applying it to one's body (oil) or lips (lip balm), it will help attracting the targeted opposite sex, particularly women.

Note: Members of the genus *Elettariopsis* in Thailand can, so far, be divided into two groups, i.e. the group with a clustered-head inflorescence, and the group with an elongated scape. This new species, together with *E. elan*, *E. slahmong* and *E. triloba*, belongs to the first group. Among these 3 taxa, *E. wandokthong* is morphologically closest to *E. triloba*, particularly the anther crest. The connective appendages of both species are similar in the presence of the small (ca. 1 mm long) tooth-like lobes at the base on each side.

However, this new species can be differentiated from *E. triloba* (Gagnep.) Loes. by its 2-4 lanceolate to oblong or elliptic leaves with glabrous surfaces, the pubescent ligule with the bilobed apex, and the hairy ovary. Moreover the calyx tube of this taxon is hairy and uniquely longer than the corolla tube.

Crushed leaves of *E. elan* C.K. Lim gives a geranium sweet smell, while *E. slahmong* C.K. Lim yields a distinctive "stinging bug" odour and *E. triloba* (Gagnep.) Loes. releases hardly discernible scent (Lim, 2003). Leaves of this new species, however, gives distinctive smell different from those 3 taxa. The smell of the crushed leaves of this new taxon is somewhat between those of *E. smithiae* and *E. elan*. Chemically, different in scent reflects different in volatile compositions. The studies on essential oils analyses of all Thai *Elettariopsis* spp. and molecular study on members of the genus found in Thailand and Malay Peninsula are on the way, the results of which will be published in separated publications.

Other specimens studied: THAILAND, cultivated specimens originally from the type location, 24 February 2006, *Picheansoonthon & Yupparach* 045.

Elettariopsis monophylla (Ganegp.) Loes. in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 603. 1939; T. L. Wu & Larsen K. in Z. Y. Wu & H. P. Raven, Fl. China 24: 356. 2000. *Amomum monophyllum* Gagnep., Bull. Soc. Bot. France 54: 163. 1907; in Lecomte, Fl. Gen. I-C. 6: 109. 1908. Figs. 3 & 4

Herbs perennial, slender, 14.1-33.4 cm; rhizome creeping, slender, bearing, pseudostem at intervals. Bladeless leaves 1-2. Normal leaves 1-4; ligule 1-2 mm long, glabrous, apex 2-lobed; petiole 13.5-23.4 cm, glabrous, channeled; leaf blades elliptic-oblong, 18.7-27.9 x 4.6-8.2 cm, leathery, dark green, base oblique, apex mucronate, margin entire to slightly undulate, both sides glabrous. Inflorescences arising from base of pseudostems, with flowers in a head, peduncles 1.9-5.2 cm long. Bracts 6-8, ovate, brownish, glabrous, 1.7-1.8 cm x 7-8 mm, apex obtuse. Bracteole lanceolate, brownish, glabrous, 0.9-1cm x ca. 1 mm, apex acute. Calyx tube shorter than corolla tube, 2.8-3.2 cm long, pinkish. Corolla tube 3-4.1 cm long, slender, white, yellowish toward the throat; lobes 3; dorsal lobe oblong, 1.9-2.1 cm x 7-8 mm, glabrous, apex hooded; lateral lobes oblong, 1.7-2 cm x ca. 6 mm. Labellum obovate, 2-2.7 x 2.2-2.4 cm, white with reddish base and yellow band in the middle; base clawed, to 6 mm long; apex crenate, slightly emarginate. Filament 2-4 x ca. 3 mm. Anther 3-5 x ca. 2 mm; connective appendage subrectangular, 7-9 x 4-5 mm, apex truncate or emarginate. Ovaries cylindrical, 3-4 x ca. 2 mm, hairy. Stylodes 2, slender, 3-4 x ca. 2 mm, not surrounding the style. Fruits capsule, ovate, reddish to reddish brown, with 6-9 longitudinal ridges.

Phenology: Flowering in March-April.

Distribution: China [Hainan Province]; Laos [Luang Prabang (type), Vientiane and Savannakhet Provinces]. Thailand Changwat Nong Khai (Amphoe So Phisai, N 13º 16.934' E 103º 26.695').

Ecology: This species grows under the shade of mixed deciduous forests, at the altitude of ca. 140 m

Vernacular names: 單葉擬豆蔻 (Chinese name).

Note: This taxon was first described in 1907, from the type specimen collected from Laos, as *Amomum monophyllum* Gagnep. It was later transferred to the genus *Elettariopsis* in 1939 by Loesener. Much later the distribution range of this species was extended to Hainan Island of China (Wu and Larsen, 2000). Large population of this species was recently discovered in the protected area of the forest temple in Changwat Nong Khai of Thailand, only less than 30 kilometers away from the Mekhong River.

Our Thai and Laos specimens are different from the type specimen in some characters, e.g. leave(s) in our specimens are 1-4, generally 2-3, while that of the type is only 1 (see Table 1 for detail).

Table 1. Difference in our specimens and type specimen.

Character	Type specimen	Our specimens
1. Height (cm)	30-50	14.1-33.4
2. Number of leaf	1	1-4, generally 2-3
3. Ligule (mm)	2	1-2
4. Petiole (cm)	14	13.5-23.4
5. Leaf shape	ovate	elliptic-oblong
6. Leaf apex	acute	mucronate
7. Leaf base	attenuate	obligue
8. Peduncle (cm)	1-3	1.9-5.2
9. Bracts	lanceolate	ovate
10. Bracteole	ovate	lanceolate
11. Labellum	ovate-oblong	obovate
12. Anther crest	square, apex truncate	sub-rectangular, apex emarginate

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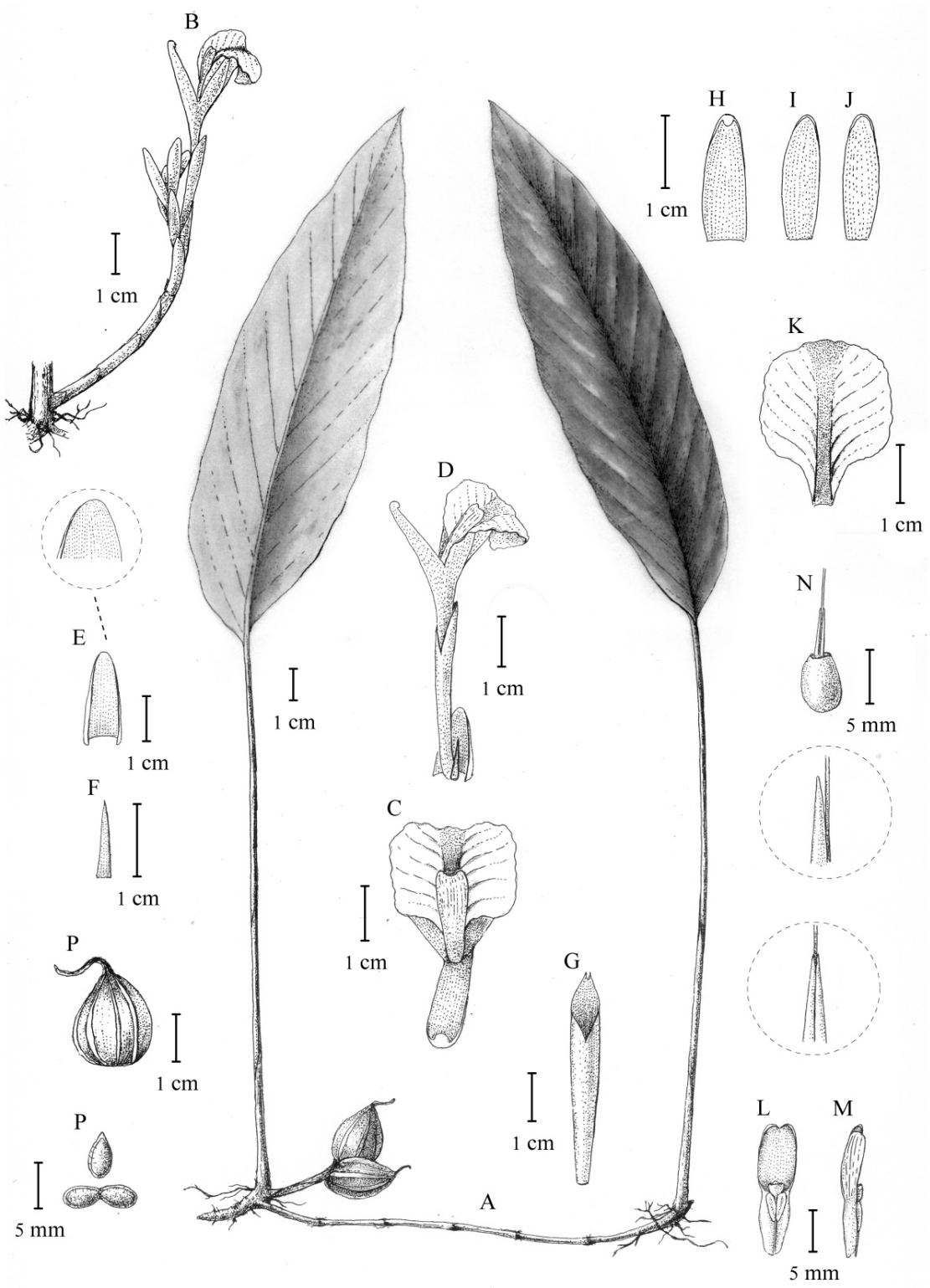


Fig. 3. *Elettariopsis monophylla* (Gagnep.) Loes. A: The plant habit, showing rhizomes, leafy stems, and infructescence. B: An inflorescence. C: Front view of a flower. D: A flower with bract and bracteole. E: Bract. F: bracteole. G: Calyx tube. H: Dorsal corolla lobe. I, J: Lateral corolla lobes. K: A labellum. L, M. Anthers, anther crest and stigma (L: Front view, M: Side view). N: Ovary with stylodial glands and lower part of the style. (Drawn by Chalermchoke Boonchit)

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Fig. 4. *Elettariopsis monophylla* (Gagnep.) Loes. A: Showing the plant in its natural habitat. B: Showing the plant habit, rhizome, leaf and fruits. C: Showing detail of a flower. D: Showing detail of fruits. (Photographed by Chayan Picheansoonthon)

Specimens studies: THAILAND: Changwat Nong Khai, Amphoe So Phisai, N 13º 16.934' E 103º 26.695′, April 22, 2007, *Picheansoonthon & Yupparach* 176 (BKF); same location, March 3, 2008, *Picheansoonthon & Yupparach* 132 (BKF). LAO PDR: Savannakhet Province, Dong Na That, March 26, 2007, *Picheansoonthon & Yupparach* 132 (BKF); Vientiane Province, Huai Dok Mai, April 4, 2007, *Picheansoonthon & Yupparach* 141 (BKF).

Key to species of the *Elettariopsis* Baker in Thailand

1. Scape with flowers in a dense head ……..…. 2
1. Scape with flowers spaced along a decurrent rachis ……..…….. 7
2. Leaves prominently veined ….……..…. *E. slahmong*
2. Leaves not prominently veined ……..…….. 3
3. Anther crest with a small tooth-like lobe at the base on each side … …… 4
3. Anther crest without a small tooth-like lobe at the base …...…….. 5
4. Ligule glabrous ..……..…….. *E. triloba*
4. Ligule puberulous ……..…….. *E. wandokthong*
5. Leaf base attenuate …… *E. elan*
5. Leaf base obliquely acute ……...…… 6
6. Leaf apex acuminate to shortly caudate ..……... *E. chayaniana*
6. Leaf apex mucronate ….....….. *E. monophylla*
7. Leaves 3-5(-6), lanceolate, glabrous and shiny ……. *E. smithiae*
7. Leaves (1-)2-3, elliptic,coriaceous and dull, strongly plicate …… ……..…… *E. exserta*

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泰國薑科植物擬豆蔻屬之研究－新種及新記錄種

Chayan Picheansoonthon[1,2*] and Piyapong Yupparach[2]

1. The Academy of Science, The Royal Institute of Thailand, Sanam Suea Pa, Sriayudhaya Road, Khet Dusit, Bangkok 10300, Thailand.

2. Pharmaceutical Botany and Pharmacognosy Research Unit, Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen 40002, Thailand.

* 通信作者。*Email: chayan@kku.ac.th*

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摘要：泰國曾經記錄有六種薑科擬豆蔻屬（*Elettariopsis* Baker）植物，本篇報告除了增加一新種：彎斗松擬豆蔻（*Elettariopsis wandokthong*）外，尚報導一泰國新記錄種：單葉擬豆蔻（*Elettariopsis monophylla*）。文中對此二新分類群均有繪圖、詳細文字描述及分布情況，且包括分布於泰國本屬植物的種檢索表。

關鍵詞：薑科植物、泰國、彎斗松擬豆蔻 (新擬)、新種、單葉擬豆蔻、新記錄。

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