A New Species of *Geostachys* Ridl. (Zingiberaceae) from Southern Thailand

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ABSTRACT: A new species, *Geostachys chayanii* Mayoe (Zingiberaceae), from peninsular Thailand is described and illustrated. Relationship with other closely related taxa is discussed.

KEY WORDS: new species, *Geostachys chayanii*, Zingiberaceae, southern Thailand.

INTRODUCTION

Members of the genus *Geostachys* Ridl. (Zingiberaceae) are all mountainous plants. They can be readily distinguished from other genera of the family by their characteristic plant habit with rhizomes supported on stilt-roots, short or fairly short inflorescence from the base of the leafy shoots, and the inflorescences erect, ascending, or decurved with flowers all pointed upwards. Most taxa of the genus are found in Malay Peninsula, with few species in Thailand, Indochina, Borneo and Sumatra. Five taxa were previously reported for Thailand: *Geostachys kerrii* K. Larsen (syn: *G. densiflora* K. Larsen), *G. holttumii* K. Larsen, *G angustifolia* K. Larsen, *G. smitinandii* K. Larsen, and *G. decurvata* (Bak.) Ridl. (Larsen and Larsen, 2006).

Geostachys angustifolia K. Larsen was described based on the type specimens collected from "Khao Pra Tha Lung Keo Mountain, Peninsula, Thailand" (Larsen, 1986). The author cited three other specimens: *Beusekom & Phengklai* 786 (from "Nakhon Sritamarat, Khao Luang near Kiri Wong, alt. 500-600 m"), *Geesink & Santisuk 5157* (from type locality), and *Kerr 15438* (from "Khao Luang Nakhon Sritamarat"), as this taxon (Larsen, 1986). He had, thus, extended the distribution of his "*G. angustifolia*" from Changwat Phang-nga to Changwat Nakhon Si Thammarat of two different mountain ranges on different sides of Peninsular Thailand.

Careful investigation of the 2 cited specimens from Khao Luang (*Beusekom & Phengklai 786* and *Kerr 15438*), with several visits to the living populations at the cited location and at the nearby mountains in the past few years, reveals that these specimens are of a different closely related species. It is recognized here as a new taxon with full description and illustrations.

TAXONOMIC TREATMENT

Geostachys chayanii Mayoe, *sp. nov.* Figs. 1 & 2

Type: Thailand, Changwat Nakhon Si Thammarat, Khao Lum Rom, N 08º 28.505' E 099º 45.052', alt 960 m, May 6, 2008 *Picheansoonthon 1021* (holotype BKF, isotypes BK, SING)

Geostachidi angustifoliae similis, foliis oblongis vel lanceolatis, cincinnis unifloris rare bifloris, labello obovato luteo sine maculis rubris basi lobis lateralibus duobus minutis patentibus, antherae crista concava tenui apicinus rotundatis, basi cum vel sine lobis lateralibus minutis, fructibus oblongis vel obovatis juventute viridibus maturitate rubrobrunneis differt.

Perrenial rhizomatous herbs, raised above the ground on stilt roots. *Leafy shoots* tufted, to 1.6 m high with up to 3-4 basal, brown, bladeless sheaths. *Leaves* 9-14, arranged in upper part of the pseudostem; lamina oblong-lanceolate, 30.1-37.2 by 2.3-4.7 cm, tapering towards the petiole, apex acuminate, margin undulate, glabrous on both sides; ligule oblong, 6-7 mm long, green or greenish brown, glabrous, apex acute; petiole 1.7-2.1 cm long. *Inflorescences* born on separate lateral shoots, 1-few at base of the pseudostem, 11.1-14.7 cm long, glabrous, slender; peduncle 2.3-4.7 cm long, glabrous, lower part covered with 6-10 reddish sheaths, oblong, 1.1-1.4 by 0.8-1.1 cm long, apex obtuse or acute, upper part covered with 2-3 dry and membranous involucral bracts, oblong, 6.1-7.6 by 1.2-1.5 cm, apex mucronate, increasing in length upwards, basal part of the inflorescence ascending, upper part (one-third to two-third) decurved (rarely ascending); rachis glabrous; cincinni 16-21, uniflorous (rarely biflorous), spreading evenly only on one side, pointing upward; cincinni stalk 0.7-1.1 cm long. *Flowers* only in the part extending from the involucral bracts; primary bracts subtending the cincinni oblong, 1.1-1.7 cm by *ca*. 3 mm, apex acute, membranous, cauduous; floral (secondary) bracts tubular, 1.5-2 cm by 5-7 mm, divide *ca.* one-fourth down, apex mucronate, glabrous; pedicel 3-4 mm long, glabrous;

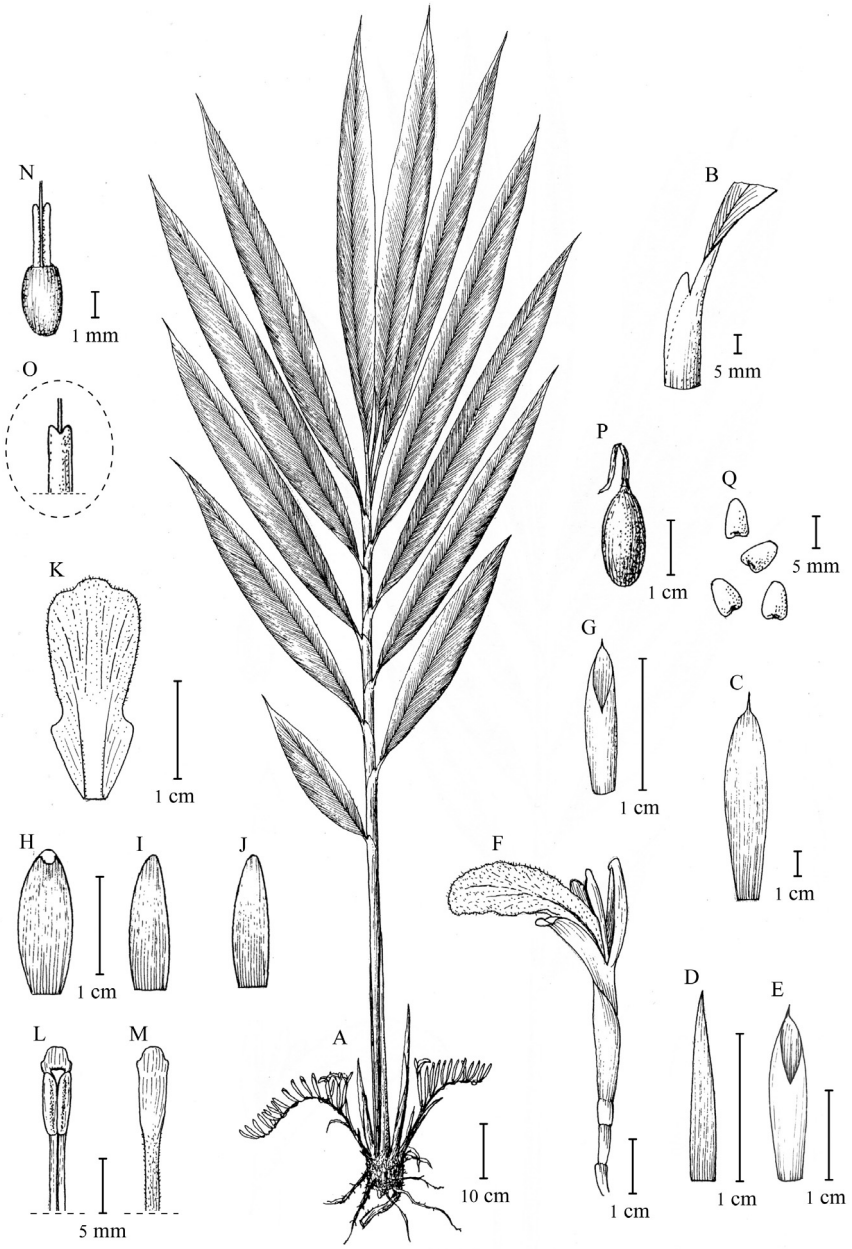

Fig. 1. *Geostachys chayanii* Mayoe. A: The plant habit showing leaves and inflorescences. B: Ligule (side view). C: Upper bract of the involucral bracts. D: A cincinnus bract. E: Bracteole. F: A flower. G: Calyx tube. H: Dorsal corolla lobe. I, J: Lateral corolla lobes. K. Labellum. L: Part of the filament showing front view of the anther and anther crest, and stigma. M. Rear view of M. N: Front view of the ovary, part of the style, and stylodial glands. O: Rear view of N. P: Fruit. Q: Seeds. Drawn by *Chalermchoke Boonchit*.

calyx tubular, 1.2-1.4 cm long, 4-5 mm broad, split down *ca.* one-fourth on one side, apex mucronate; corolla tube *ca.* 1.1 cm long; dorsal corolla lobe ovate, 1.4-1.5 cm by *ca.* 7 mm, apex hooded, basal part light reddish, upper part light creamy colour; lateral corolla lobes oblong, 1.4-1.5 cm by 5-6 mm, apex obtuse to slightly hooded, basal part light reddish, upper part light creamy colour; labellum oblong-obovate, 1.9-2 by 1.2-1.3 cm, with two small lateral lobes, minutely hairy on upper surface; anthers *ca.* 6 by 2 mm, opening with longitudinal slits; filament 7-8 mm long, dorsal part hairy, anther crest *ca.* 2 mm long and wide, concave, apex round or acute, with or without two small side lobes; stigma obconical with mouth horizontal at the apex; ovary oblong, *ca.* 3 by 1.5-2 mm, glabrous, stylodial gland 1, apex shallowly emarginate. *Fruits* capsule, oblong to oblong-obovate, 1.4-1.5 cm by 5-7 mm, green when young, turning reddish brown when

Fig. 2. *Geostachys chayanii* Mayoe. A: The plants in the type location. B: Part of the psedostem showing the petioles and the ligules. C, D: An inflorescence showing the pure yellow labella. E: Detail of a flower showing the anther crest and the pure yellow labellum. F: An infructescence showing oblong to obovate fruits. Photographed by *Chayan Picheansoonthon.*

mature. *Seeds* 2 in each locule, obovate, *ca.* 6 by 0.4 mm, white with small thread-like aril in lower.

Distribution: Thailand. Endemic to Nakhon Si Thammarat Mountain Range in Peninsular Thailand. It is found in Khao Luang (Khao Luang National Park), Khao Maen and Khao Lum Rom (Namtok Yong National Park) in Changwat Nakhon Si Thammarat, Thailand.

Spemens examined: Thailand, Nakhon Srithamarat, Khao Luang, *Beusekom & Phengklai 786* (BKF); same location, *Kerr 15438* (BK); same location, *Picheansoonthon 1027* (BKF); Thailand, Nakhon Si Thammarat, Khao Maen, *Picheansoonthon 1056* (BKF).

Ecology: This new taxon grows in evergreen hillside forest on humus soil, on rock under the shades, at the altitude of 890-1200 m.

Etymology: This new species is named in honor of Dr. Chayan Picheansoonthon, fellow of the Royal Institute of Thailand and Thailand's leading pharmaceutical botanist and pharmacognosist, in recognition of his contribution to our knowledge of the Thai Zingiberaceae, particularly in the genera *Caulokaempferia*, *Kaempferia*, *Elettariopsis*, and *Hedychium*. He visited the type locations of *G. angustifolia* and *G. kerrii* with the author, and pointed out that this new species is different from the two prior taxa.

Note: From herbarium specimens, both *G. angustifolia* and *G. chayanii* may be very much resembled. However, both taxa are quite different when investigate all details of the flowers and fruits. The prior species can be distinguished by its 2-flowered (rarely 1-flowered) cincinni, the larger lateral lobes of the labella, the yellow labella with red dots, the 3-lobed anther crests with 2 horn-like side lobes, and the reddish brown subglobose fruits which turn black when matured (Fig. 3). While the latter taxon is characteristic in its 1-flowered (rarely 2-flowered) cincinni, the much smaller lateral lobes of the labella, the yellow labella without red dots, the thin and round anther crests without 2 horn-like side lobes, and the green obovate-oblong fruits which turn reddish brown when matured (Figs. 1 & 2).

Near the type location, Khao Lum Rom, this new taxon can also be found on Khao Maen (Namtok Yong

Fig. 3. *Geostachys angustifolia* K. Larsen. A: The plants in the type location. B, C: An inflorescence. D: Detail of a flower showing the anther crest and the red dots at the base of the labellum. E: A cincinnus showing a flower with red dots on the labellum and a reddish brown young fruit. F: An infructescence showing a black riped fruit. Photographed by *Chayan Picheansoonthon.*

NP) and Khao Luang (Khao Luang NP). At Khao Luang, herbarium specimens of this new species were collected by other collectors, ie. *Beusekom & Phengklai 786* and *Kerr 15438*. These two specimens were previously referred to *G. angustifolia* (Larsen, 1986).

Also, earlier at Khao Luang, another taxon, *G. densiflora*, was also reported (Larsen, 1962). The name given to this species was previously used by Ridley for the Malayan taxon, *G. densiflora* (Holttum, 1950). Therefore, ten years later, the same author changed the specific epithet of this Thai taxon to *G. kerrii* (Larsen, 1972). However, *G. kerrii*, which grows in higher altitude of Khao Luang, is quite different from this new species in many aspects, e.g. the plant habit (much larger), the inflorescence (ascending and highly compacted on a rather short rachis).

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泰國南部的新種薑科植物－*Geostachys* Ridl.

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摘要：本文敘述及圖示泰國南部新種薑科植物－*Geostachys chayanii* Mayoe，並討論與相似種的關係。

關鍵詞：新種、*Geostachys chayanii* Mayoe、薑科、泰國南部。