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A new species and a new record of Zingiberaceae from Sumatra, Indonesia

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ABSTRACT: *Zingiber alba* is a new species from West Sumatra. *Scaphoclamys perakensis* is newly recorded species from the Eastern part of Sumatra. Detailed descriptions and photographs are given for each species.

KEY WORDS: *Scaphoclamys perakensis*, Zingiberaceae, *Zingiber alba*, Sumatra.

INTRODUCTION

Sumatra is the fifth largest island in the world and is considered very rich with a variety of tropical rainforest plants. These plants have been used by the Sumatrans over the centuries for many purposes, such as a source of food, aromatic agents, coloring matter, insecticides, and medicines, as well as for their economic value, such as the source of a variety of woods, rattan, resin and other non-woody forest products.

Scientifically, until the 1950s, the Sumatran flora was relatively untouched, as stated by Steenis who quoted *Pennant's Dictum* 160 years previously saying that "Sumatra still needs its florist". Since then, very few investigations have been performed on Sumatran forest plants (Van Steenis 1950). As for Zingiberaceous plants, Miquel noted the presence of 28 species in Sumatra (Miquel, 1862).

Realizing the danger of losing these Sumatran plants and their related traditional knowledge and culture, our first inventory of Sumatran plants was carried out around Bukittinggi and Padang in 1982 (Arbain *et al*., 1989).This initial work was then followed by other inventories around Sumatra as well as by some doing chemical and bioactivity studies on selected constituents of some Sumatran plants (Arbain 2012).

In the last decade, realizing the scientific, cultural and economic values of these Sumatran Zingiberaceous plants, some more inventory were carried out and focused on this family 49 Zingiberaceous plants were found, some of which were known and few were not reported before (Nurainas, 2012, PhD Dissertation, unpublished).

The challenge on the inventory of these Sumatran Zingiberaceous plants also pointed out by Larsen (2007) saying that the available specimens in the herbaria mostly collected by common people who did not fully understand how to collect, describe and preserve the specimens. Started in the year 2000 we reorganized our Zingiberaceous collections method and the specimens obtained were deposited at ANDA Herbarium of Andalas University. As a result some new findings were reported Takano (2003) and Droop *et al.* (2014). On the genus of *Zingiber* in particular, since 2014 we have collected new collection as well as new herbarium materials. So far, at least 17 species of *Zingiber* have been identified from Sumatra (Table 1).

Table 1. Currently Checklist of *Zingiber* species in Sumatra.

Species	Distribution in Sumatra
Z. acuminatum	South Sumatra
Z. aurantiacum	Riau
Z. cyrtostachys	Aceh
Z. engganoensis	Bengkulu (Ardiyani, 2015)
Z. fraseri	North Sumatra
Z. gracile	West Sumatra
Z. griffithii	North Sumatra
Z. kunstleri	West Sumatra
Z. loezerghii	North Sumatra
Z. macradenium	West Sumatra, North Sumatra
Z. macroglosum	West Sumatra
Z. multibracteatum	West Sumatra
Z. spectabile	West Sumatra
Z. montanum	**Cultivated**
Z. officinale	**Cultivated**
Z. ottensii	**Cultivated**
Z. zerumbet	**Cultivated**

During last year and this year inventory of Sumatran Zingiberaceous plants in the montane forest of Southern Solok District in West Sumatra one particular *Zingiber* species having inflorescences up to 100 cm tall was discovered.

This species was first discovered on the edge of small river in the Panti Nature Reserved Forest in West Sumatran Province in 2006 (*Nurainas* NS2018). About one meter tall of inflorescence having bright white bract and yellow labellum of this species looked characteristic among the other green forest plants surroundings. Unfortunately during the big earthquake on 30 September 2009 most of wet materials including the

Table 2. Comparison of morphological characters of ***Zingiber alba*** and ***Z. acuminatum*** var. ***acutibracteata***.

Character	***Z. alba***	***Z. acuminatum*** var. ***acutibracteata*** (Valeton, 1918)
Ligule	Apex rounded, hairy, 4-10 mm long	Truncate, subretuse, lobed
Inflorescences tall	40-80 cm	50-150 cm long
Spike	Elongated, apex Rose-like	Cylindrical to elliptic-obtuse, apex acute
Bracts	Ovate, bright white, subapical-mucronate, declined	Obtuse with a mucro below the top, red upper part, straight
Bracteole	Transparent, white	Transparent, pale pink
Labellum	Pale yellow, subtrilobed, lobus obtuse	Pale sulphureus, trilobed, lobus obtuse or retuse,

flower specimen of this species as well as the Herbarium itself were badly damaged. Attempts to re-collect this flower specimens were unsuccessful due to the collecting trips were not in the right flowering season.

In the year of 2014, one of our former students held a field observation to finalize his Bachelor's research work on West Sumatran Zingiberaceous plants. The same species was found in Kubung and Simanau area in the Southern Solok District of West Sumatra. Last year we repeated the collecting trip to Simanau and these newly collected specimens were compared to that of similar specimens in Herbarium Bogoriense (BO). There are two specimens which is *C.A Backer 11493* namely Z. *acuminatum* var. *acutibracteata* and *Meiyer 1829* namely *Zingiber* cf. *acuminatum* that collected in Java looks similar.

In other inventory at the lowland Dipterocarp forest near Pasir Pengarayan in Riau Province, the large populations of *Scaphoclamys perakensis* was also found. The unique feature of this species is spirally bract in the inflorescence and white labellum with purple marking on the midline near the base. Although Searle (2010) reported the distribution of the genus *Scaphoclamys*also in Sumatra, but *Scapholamys perakensis* was reported previously only in Perak, Trengganu, Peninsular Malaysia.

TAXONOMIC TREATMENTS

Zingiber alba Nurainas**, *sp. nov*** **Fig. 1**

Type: **INDONESIA**, Sumatra, Simanau, Solok, West Sumatra, altitude 1200 m, 21 June 2016, *Nurainas 3272* (holotype ANDA, isotype BO, TAI).

Zingiber alba differs from *Zingiber acuminatum* var. *acutibractetatum* Valeton in its apex of ligules rounded, elongated of spike, arrangement of bract at top of spike is rose-like, bract bright white, ovate with subapicalmucronate, bracteole small, white and yellow flower

Herbs 3−3.5 m. tall., rhizomes near surface of ground, cream inside, fleshy, with tubers. Pseudostems erect, thick, basal sheaths green. Leaves12−22 in one plant, petioles 0.7−1.5 mm, glabrous, ligule 0.4−1.0 cm long, apices rounded, hairy, green; laminae 50−55 × 10−12 cm, narrrowly-lanceolate, base attenuate, tips long-acuminate, hairy. Inflorescences radical, many flower in clump, oblong to elongate; peduncles 25−40 cm long, scale oblong, 6.0−7.0 × 4.0−4.5 cm, greenish-white, glabrous; spikes elongated, 20−40 cm long, 4−6 cm diam., rose-like at apex; bracts imbricate, revolute, thin, numerous, sterile bract 4.0−4.0 × 2.0 −3.0 cm,spathulate, apices subapical-mucronate, bright white, fertile bract 5−7 × 3−6 cm,spathulate, apices subapical-mucronate, bright white, bracteoles small, 1.0−1.5 × 0.5−0.7cm, lanceolate, transparent-white, glabrous. Flowers1−3 flowers open at a time, tubular, 7−8 cm long; calyx 3.0−3.5cm, tubular, acute, white, glabrous; corolla tubular, tube 4−4.5 cm long, pale yellow, glabrous, corolla lobes subequal, central 3.0−3.5 × 1.0−1.5 cm, lanceolate, apex acute, laterals 2.5−3.0 × 0.5−0.8 cm., glabrous; labellum3.0−3.5 × 2.5−3.0 cm, subtrilobed, pale yellow, glabrous, apex rounded-undulate; anther1.2−1.5 cm long with a beak shape appendage, appendage 1.5−1.7 cm long, pale yellow and bright yellow tip, thecae 2, parallel, pale yellow; style filiform, stigma pale yellow with an circular apical aperture surrounded by stiff hairs; epigynous glands, 1 pair, 0.6−0.8 cm long, linear; ovary 0.5−0.7 cm diam., glabrous, bright white. Fruit ellipsoid, trilocular, 3.0−3.5 cm long, 1.5−2.0 cm diam. glabrous, cream; seed black with white aril, 0.4−0.6 × 0.3−0.4 cm.

Distribution: throughout West Sumatra province and Batang Gadis National Park, North Sumatra.

Ecology: *Zingiber alba* grows on sandy soils along the margins of mixed evergreen forests, edges of small rivers at 500-1200 meter elevation.

Etymology: the epithet specific refers to color of bract.

Phenology: *Zingiber alba* was observed in flower when it was collected in February 2006 and May 2016 and fruit when it was collected in October 2014.

Vernacular name: Penggalan (Minangkabau language).

Other specimens examined: **INDONESIA**. Sumatra: West Sumatra, Rimbo Panti Nature Reserve, 06 Feb. 2006, *Nurainas* NS2018 (ANDA); Kubung, Solok, 3 Oct. 2014, *Riki Chandra* 06 (ANDA); Simanau, Solok, 19 Apr. 2014, *Riki Chandra* s.n (ANDA); 20 May 2016, *Nurainas* 3272 (ANDA, BO); North Sumatra, Panyabungan. Batang Gadis NP, 8 Jul. 2006, *A.D. Poulsen* 2454 (AAU, BO, E & ANDA).

Notes: *Zingiber alba* is know from some collection in West Sumatra and a collection from North Sumatra. It seems to have affinity with *Z. acuminatum* var. *acutibracteata* Valeton. It differs in its elongated spike, shape, apex, color of bract, and the color of flower (Table 2).

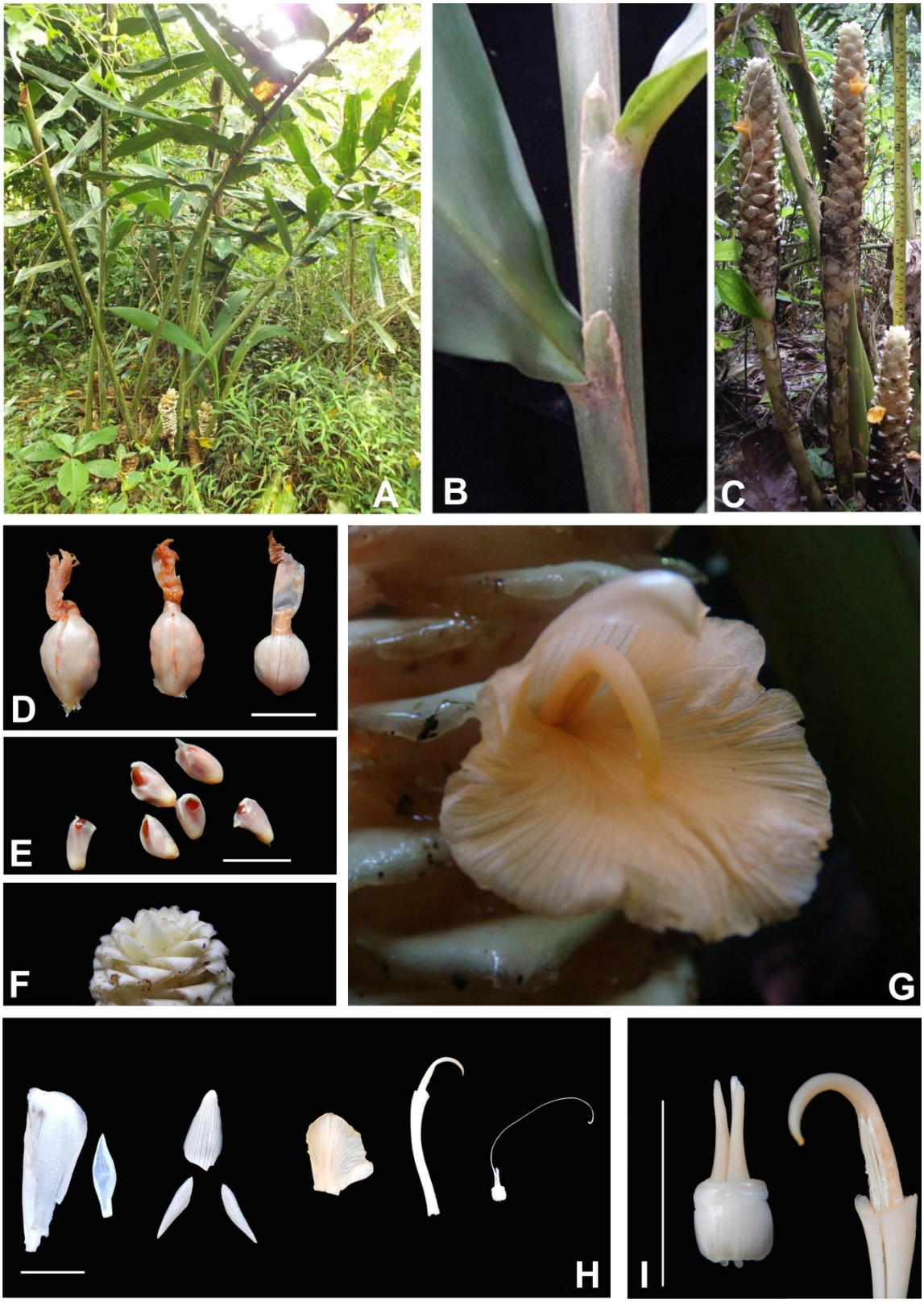

Fig. 1. ***Zingiber alba*** Nurainas. **A**: The plant habit. **B**: Part of the pseudostem showing the lower part of leaves and ligules. **C**: Inflorescence. **D**: Fruits. **E**: Seeds. **F**: Top part of inflorescence. **G**: A flower. **H**: Dissection of flower (from left): bract, calyx, corolla lobes, floral tube with stamen attach, ovary with epigenous gland style and stigma. **I**: detail of stamen and ovary with epigenous gland. Scale bar: **D** = 2 cm; **E** = 1 cm; **H** = 2 cm; **I** = 2 cm. *Photographed by Nurainas*.

Scaphoclamys perakensis Holtt., *Scaphochlamys perakensis* Holttum, Gard. Bull. Singapore 13 (1950) 97., nom. nov. — Basionym: *Curcuma lanceolata* Ridl., Mat. fl. Malay. Penins.2 (1907) 22. — *Hitcheniopsis lanceolata* (Ridl.) Ridl., Fl. Malay Penins. 4 (1924) 253. — Type: *C. Curtis 2522* (holo SING!), Perak.

Fig. 2

Herbs. Rhizomes subsurface, creeping, white inside, roots many, fleshy. Stems erect, short, bearing two leaves. Leaves 1−2 in one plant, petioles15−30cm, glabrous, ligule no or very short, glabrous, pale green or dry in old plant, margins hyaline; laminae30−50 × 7−12cm,narrrowly-lanceolate, base attenuate-asymmetric, tips acute, glabrous. Inflorescences terminal, one per plant, more or less cylindrical, peduncles 7−8 cm, green, glabrous; spikes ovoid to elongated, 8.0−10 cm long; bracts imbricate, revolute, thin, numerous, 2.0−3.0 × 2.0 −2.5cm,ovate, apices acuminate to shortly apiculate, green; first bracteole 2.0−2.2 × 0.5−0.7 cm, lanceolate-inclined, glabrous and hairy edges. Flowers 1−3 flower open at a time, tubular, 2−3 cm long; calyx 0.8−1.0 cm long, tubular, greenish-white, hairy; corolla tubular, tube 1.5−2.0 cm long, white, glabrous, central 0.7−0.8 ×0.2−0.3 cm, lanceolate to triangulate, apex acute, laterals 0.6−0.7 × 0.1−0.2 cm., glabrous; labellum 0.9−1.0 × 0.5−0.7 cm, subtrilobed, central lobe bigger than lateral, white, with pink markings on the middle line near the base and a median yellow patch near apices, glabrous, apex rounded; anther 0.5−0.6 cm long with shortly appendage, white, thecae 2, parallel, white; staminodes0.4−0.5 cm long, white, rarely reflexed, acute apex; style filiform, stigma white with an circular apical aperture surrounded by stiff hairs; epigynous glands 1 pair, 0.5−0.6 cm long, linear; ovary 0.2−0.3 cm diam., hairy. Fruit ellipsoid, trilocular, 0.6−0.8 cm long, 0.4−0.5 cm diam., glabrous, white.

Distribution: Perak and Sumatra (Riau).

Ecology: *Scapholamys perakensis*grows on the forest floor at limestone area.

Etymology: The epithet specific refers to the name of its natural location.

Phenology: Flowers from May through October.

Additional specimen examined: **INDONESIA**. Sumatra: Riau, Huta Gua Sikapir, Rokan Hulu, 25 May 2016, *Nurainas* 3270 (ANDA, BO).

Notes: The measures of descriptions in this report were based on the fresh materials which might be bigger than reported by Holttum (1950) dan Searle (2010).

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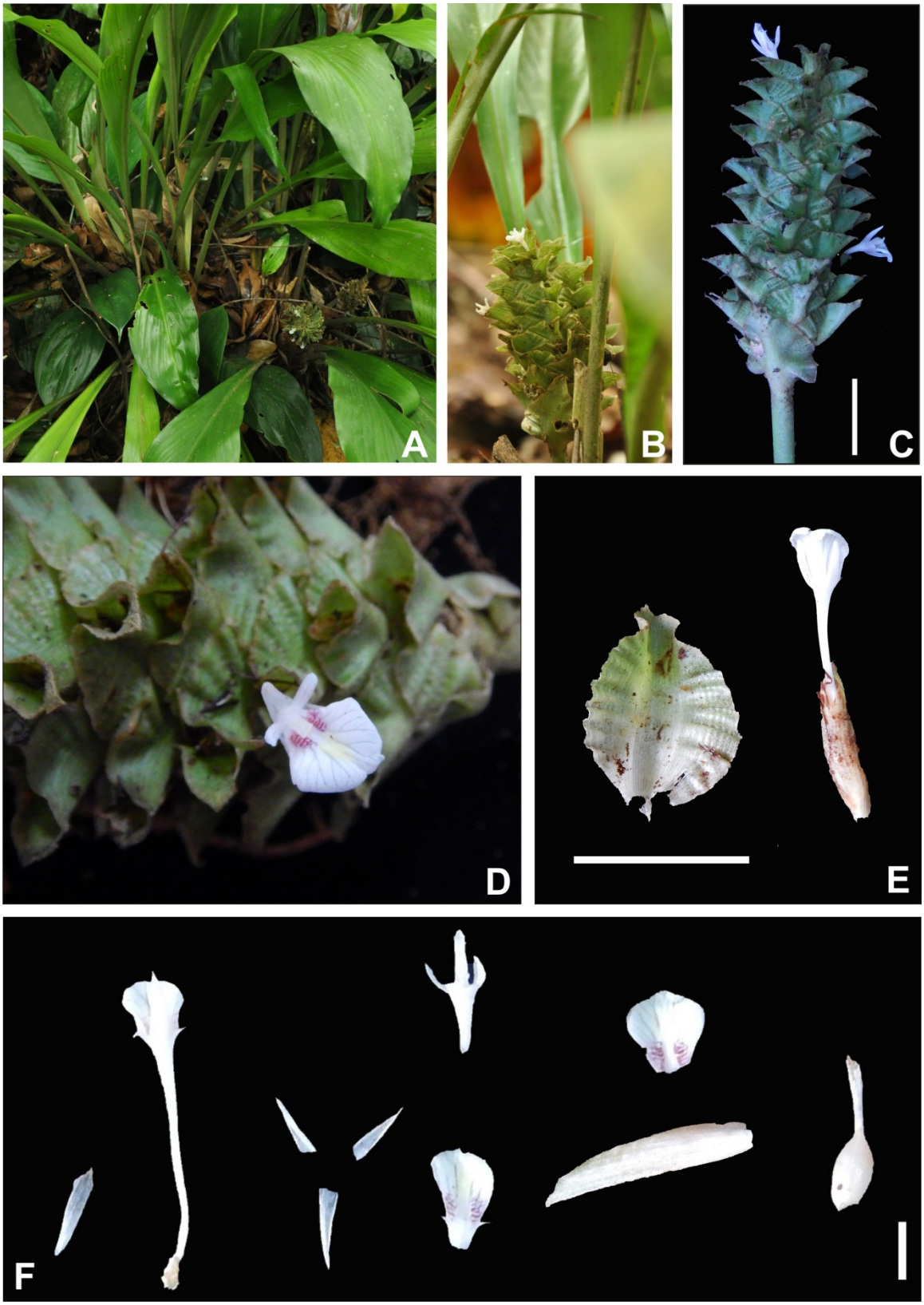

Fig. 2. ***Scaphoclamys perakensis*** Holtt. **A**: The plant habit. **B** & **C**: A inflorescence. **D**: Inflorescence with flower. **E**: A bract and flower (front side). **F**: Dissection of flower (from left): calyx, flower, corolla lobes, labellum, stamen with staminodes, bract and young fruit. Scale bar: **C** = 2 cm; **E** = 2 cm; **E** = 2 cm; **F** = 5 mm. *Photographed by Nurainas*.