



Fig. 3. Distribution maps. A: *C. evansii* (●) and *C. hukaungensis* (■). B: *C. meghalayensis* (+), *C. minor* (■) and *C. spicatus* (●).

2. *Calamus hukaungensis* A. Henderson, sp. nov.

Figs. 1B & 2B

TYPE: MYANMAR. Kachin: Ledo road, Tanai Township, 38 km S of Tanai toward Myitkyina, 26°03'N, 96°43'E, 285 m, 3 Feb 2005, A. Henderson, C. Peters, U Saw Lwin, U Myint Maung, U Tin Maung Ohn, U Tun Shaung, U Kyaw Lwin 3174 (HOLOTYPE: NY! ISOTYPES: K! RAF! RANG!).

A similaribus speciebus differt inflorescentiis bracteis primariis marginibus apicibus dense setosis.

Stems clustered, to 4 m long and 0.8-1 cm diameter (with leaf sheaths). Leaf sheaths greenish-brown with whitish tomentum, densely covered with reddish-brown, flattened, horizontally spreading spines to 1 cm long, with a non-spiny, swollen area both sides of sheath between petiole insertion and knee; knees present; ocreas present, to 0.5 cm long, densely bristly; flagella present, to 1.5 m long; petioles 12-22 cm long, sparsely covered laterally and abaxially with recurved spines to 0.5 cm long; rachis 16-30 cm long, abaxially with few, recurved, solitary spines; pinnae 4-6 per side of rachis, lanceolate, arranged in distant groups, 20-30 cm long, 2.5-3.5 cm wide, without spines except at apices, the apical pair of pinnae joined at their bases for one quarter to one half their length; cirri absent. Inflorescences to 2 m long, flagellate; partial inflorescences inserted below the mouth of the partial inflorescence bract; partial inflorescence bracts, closely sheathing the main axis except at the apex, where open and flat (and apparently tattering), with few, very short, recurved spines, the apical margins densely covered with bristles as the ocrea; staminate inflorescences branched to three orders, with up to 3 partial inflorescences; rachillae to 1.5 cm long; rachillae bracts distichously arranged, to 1 mm long, glabrous except for ciliate margins; floral bracteoles 0.5 mm long, glabrous; staminate flowers to 3 mm long, to 14 per rachilla, arranged alternately and distichously along the rachillae; calyx 2 mm long,

tubular except for the 3-lobed apex; corolla 3 mm long, with 3 valvate petals free to the base; pistillode 0.5 mm long; pistillate inflorescences branched to two orders, with up to five partial inflorescences, each with up to 15 rachillae; rachillae 1.5-5 cm long; rachillae bracts distichously arranged, 2 mm long, with brown hairs; pistillate flowers to 20 per rachilla, borne alternately and distichously along the rachillae; sepals to 3 mm long, connate basally for ca. two-thirds their length, lobed above; petals to 3 mm long, free; fruits not seen.

Local names and uses: htin phu (Naga language); the stems used for weaving.

Distribution and habitat: Myanmar (Kachin)(Fig. 3A); lowland forest on flat land, at 190-285 m elevation.

Notes: Distinguished from other species in Group V by its partial inflorescences inserted below the mouths of the partial inflorescence bracts, which are open at the apex and have densely bristly apical margins.

Additional specimen examined: MYANMAR. Kachin: Shinbiyang gold mine, disturbed area near mine, 26°41'N, 96°13'E, 190 m, 14 Jan 2005, Henderson et al. 3125 (K, NY, RAF, RANG).

3. *Calamus meghalayensis* A. Henderson, stat. & nom. nov. *Calamus floribundus* var. *depauperatus* Becc., Ann. Roy. Bot. Gard. (Calcutta) 11: 79. 1908. Type. INDIA. Meghalaya: Gari in the Garo Hills, no date, *C. Clarke s. n.* (HOLOTYPE: FI-B n.v.; holotype image in Beccari 1913).

Stems to 2 m long and 0.5-0.6 cm diameter (with leaf sheaths). Leaf sheaths green with brown tomentum, sparsely covered with brown, flattened, horizontally spreading spines to 1 cm long; knees present; ocreas present, less than 0.5 cm long, densely bristly; flagella present, to 2 m long; petioles

6-18 cm long, sparsely covered laterally and abaxially with recurved spines to 0.5 cm long; rachis 9-24 cm long, abaxially with few, recurved, solitary spines; pinnae 4-5 per side of rachis, lanceolate, arranged in distant groups or solitary, 13-23 cm long, 2-3.5 cm wide, minutely spiny along the margins, the apical pair free or briefly joined at their bases; cirri absent. Inflorescences to 1 m long, flagellate; partial inflorescences inserted above the mouth of the partial inflorescence bracts; partial inflorescence bracts closely sheathing the main axis, with recurved spines, bristly at the apex; staminate inflorescences branched to two orders, with up to 3 partial inflorescences; rachillae 0.5-1 cm long; rachillae bracts distichously arranged, to 1 mm long, more or less glabrous; floral bracteoles to 0.5 mm long; staminate flowers to 2 mm long, to 20 per rachilla, arranged alternately and distichously along the rachillae; calyx 1.5 mm long, tubular except for the 3-lobed apex; corolla 2 mm long, with 3 valvate petals free to the base; pistillode 1 mm long; pistillate inflorescences branched to two orders, with up to three partial inflorescences, each with up to 12 rachillae; rachillae 1-2.5 cm long; rachillae bracts distichously arranged, to 2.5 mm long, with brown hairs; pistillate flowers to 20 per rachilla, borne alternately and distichously along the rachillae; sepals to 3 mm long, connate basally for ca. two-thirds their length, lobed above; petals to 3 mm long, free; fruits not seen, according to Basu (1992) globose, to 1 cm diameter, yellowish.

Local names and uses: risigin, tairu, rita (India); no uses recorded.

Distribution and habitat: Northeastern India (Meghalaya)(Fig. 3B); lowland forest at low elevations in the Khasi Hills.

Notes: Although the type specimen has not been seen, Beccari's (1908) description and photograph (Beccari, 1913, plate 48) of *C. Clarke s. n.* shows it to be clearly distinct from *C. floribundus*, as suggested by Beccari himself (1908). Not only is it (and the specimens cited below) smaller in all dimensions, but the leaf sheath spines are quite different from those of *C. floribundus*. The name *C. meghalayensis* is given here because the epithet *depauperatus* is preoccupied (*Calamus depauperatus* Ridl.)

Additional specimens examined: INDIA. Meghalaya: Nenkra, Garo Hills, 6 Jan 1930, Parry 837a (K); Bamanigaon, in swamp, near sea level, 20 Nov 1949, Thakur Rup Chand 2493 (BH); Rani, 4 Feb 1952, W. Koelz 29229 (BH).

4. *Calamus minor* A. Henderson, sp. nov.

Figs. 1C & 2C

TYPE: LAO. Bolikhamsay: Thaphabat Province, close to Ban Hatkhai, 18°24'N, 103°09'E, 140 m, 17

Dec 1998, *Khamphone Sengdala & T. Evans* 319 (HOLOTYPE: K!).

A Calamo hypoleuco differt caulibus 2.5-3 m longis; foliis vaginis spinis usque 1 cm longis, vaginis apicibus spinis interdum usque 2 cm longis.

Stems clustered, 2.5-3 m long and 0.7-1 cm diameter (with leaf sheaths). Leaf sheaths greenish-yellow, sparsely covered with brown, black-tipped, flattened, horizontally or upward spreading spines to 1.4 cm long, those at sheath apex sometimes to 2.5 cm long; knees present; ocreas present, to 0.3 cm long, fibrous, disintegrating; flagella absent; petioles 3-10 cm long, sparsely covered laterally and abaxially with recurved spines to 0.5 cm long; rachis 40-70 cm long, abaxially with few, recurved, solitary spines; pinnae 5-6 per side of rachis, lanceolate, regularly but distantly arranged, 15-30 cm long, 1.7-4 cm wide, gray abaxially, without marginal spines except near apices, the apical pair of pinnae only briefly joined at their bases; cirri absent. Inflorescences 0.2-0.4 m long, briefly or not flagellate; partial inflorescences inserted at the base of the partial inflorescence bract; partial inflorescence bracts open and not sheathing the main axis, not spiny; staminate inflorescences branched to three orders, with 4-6 partial inflorescences; rachillae to 0.5 cm long; rachillae bracts distichously arranged, to 1 mm long, glabrous; floral bracteoles 0.5 mm long, glabrous; staminate flowers to 3.5 mm long, to 10 per rachilla, arranged alternately and distichously along the rachillae; calyx 2 mm long, tubular except for the 3-lobed apex; corolla 3 mm long, with 3 valvate petals free to the base; pistillode absent; pistillate inflorescences branched to two orders, with up to six partial inflorescences; rachillae to 1.5 cm long; rachillae bracts distichously arranged; pistillate flowers not seen; fruits not seen.

Local names and uses: wai deng, wai hangnou (Lao); the shoot is edible and the stems used for handicrafts.

Distribution and habitat: Lao (Bolikhamsay) (Fig. 3B); lowland forest, at 140-160 m elevation.

Notes: The Lao specimens cited here were included by Evans et al. (2002) in *Calamus hypoleucus*, a species known only from Myanmar. However, as noted by Evans et al., the Lao specimens have longer leaves and narrower pinnae, these with spiny margins near the apex, and longer inflorescences.

Additional specimens examined: LAO. Bolikhamsay: Thaphabat Province, Bhat kai, 18°24'N, 103°08'E, 160 m, 10 Apr 1998, *Khamphone et al.* 138 (K); Thaphabat Province, close to Ban Hatkhai, 18°24'N, 103°09'E, 140 m, 17 Dec 1998, *Khamphone & Evans* 320 (K); same locality, same date, *Khamphone & Evans* 321 (K).