

solitary habit. Herbarium material without this information can be more difficult, especially if the reduced terminal partial inflorescences or inflorescences from young stems have been collected.

In Pakkading Distr., Bolikhamxay Province, *C. solitarius* is widely sympatric with a plant we consider to be *Calamus tetradactylus* Hance (specimens *Oulathong V. Viengkham* 207, 208 and 209 in FRCL and K). At this site they are easily separated on the basis of consistent differences in the leaves and leaflets, even when habit and inflorescences are not seen. This lends support to the conclusion that these are two distinct taxa.

*Calamus solitarius* is one of the premier quality small-diameter canes in Laos but its solitary habit precludes resprouting and it is likely to be vulnerable to over-harvesting.

Houay Say, cited in the localities above, is wrongly marked on the standard 1:100 000 maps of Laos as H. Kay.

**3. *Calamus pauciflorus* T. Evans, K. Sengdala, O. V. Viengkham, B. Thammavong & J. Dransf. sp. nov.** a *C. tetradactylo*, *C. cambojense* et *C. solitarius* inflorescentiis debilibus, femineis in 1 ordines masculis in 2 ordines ramificantibus, inflorescentiis partialibus longissimis 11 cm nonexcedentibus recedit; a *C. dioico* Lour. (*sensu* Beccari 1908) ocrea nuda, paginis foliorum inermibus et foliolis apicalibus partim connatis, inflorescentia feminea in 1 ordines ramicanti differt. Typus: Laos, *Khamphone Sengdala* 324 (holotypus K, isotypus FRCL).

Slender, climbing, clustering, flagellate rattan reaching at least 7 m long, often flowering when less than 2 m long. Stem without sheath up to 5 mm diam., with sheath 5 – 10 mm. Leaf ecirrate, 0.4 – 0.6 m long, sheath green in life, weakly or moderately armed with yellow-brown, horizontal or slightly ascending, acicular spines 2 – 7 mm long with very slightly swollen bases, ocrea very small, unarmed, marcescent; knee present, clearly defined, petiole of upper leaves 5 cm, channelled adaxially, rounded abaxially, unarmed or armed with a few spines abaxially, rachis adaxially acutely bifaced and unarmed, abaxially rounded and sparsely armed with hooked, black-tipped spines up to 5 mm long; leaflets 5 – 9 on each side of the rachis, mostly swept forward, strongly grouped in pairs, pairs more or less opposite, lowest group with a single leaflet each side, terminal leaflets in a group of four, the distal pair connate along 20 – 40% of their length, lanceolate, up to 14 – 25 × 1.8 – 3.4 cm, adaxial midrib prominent, two lateral costae sub-prominent, abaxially 1 – 3 veins sub-prominent, no bristles on ad- or abaxial faces, leaflet margins naked or with very occasional stiff bristles, including one or two close to the tip, transverse veinlets many, slightly sinuous, not interrupted. Inflorescences very slender, flagelliform, 1.3 – 2.2 m excluding terminal flagellum, very weakly branched, the male ones barely branched to two orders, the basal partial inflorescences up to 11 cm long including a stalk (or, equally, a secondary bract) up to 1.5 cm, with one terminal rachilla 3.5 – 4.5 cm long and one or rarely up to three shorter side branches, distal partial inflorescences rarely branched; primary branches swollen at base; rachillae slender, rachilla bracts with two acute limbs, one appressed to axis, one free; involucre inserted in rachilla bract and also bearing two acute limbs;

staminate flowers not seen, but clearly close together (4–6 per cm on each side of the rachilla). Female inflorescences branched to one order, the partial inflorescences formed by a single rachilla arising directly from the axis, less than 10 cm total length including a stalk up to 1.5 cm and swollen at the base; flower scars along one side c. 3 mm distant, rachilla bract with an apiculate limb over 2 mm long, involucre almost wholly immersed in the rachilla bract, held at an acute angle to the rachilla axis. Pistillate flowers not seen. Immature fruit spherical, abruptly beaked, epicarp scales unchannelled, drying yellow with red-brown margin. Fig. 3.

**DISTRIBUTION AND HABITAT.** Laos (Bolikhamxay Province) and (historically) Thailand (Nong Khai Province) in evergreen forest and tall, bamboo-rich scrub on seasonally-flooded ground at about 200 m.

**LOCAL NAMES.** *wai kating* (in both Thailand and Laos).

**SPECIMENS EXAMINED.** LAOS. Ban Pakleuk, where the Houay Phai crosses the Muang Hom Road, Thapahabaat Distr., Bolikhamxay Province, 18°24'00" 103°09'00", 10 April 1998, stam. *Khamphone* 139, stam. *Khamphone Sengdala* 140, 17 Dec. 1998, stam. *Khamphone Sengdala* 323 (all FRCL, K), 17 Dec. 1998, fr. *Khamphone Sengdala* 324 (holotype K, isotype FRCL). THAILAND. Pon Pisai, Nong Khai Province, 24 Feb. 1924, fr. A. *Kerr* 8560 (K, BK).

**NOTES.** The known range of the species is very limited (the two localities are less than 50 km apart) but its occurrence in a highly degraded habitat (of a kind which has received little fieldwork in Laos) suggests that it will be found more widely in future.

**4. *Calamus bimaniferus* T. Evans, K. Sengdala, O. V. Viengkham, B. Thammavong & J. Dransf. sp. nov.** a ceteris speciibus Indochinensis praesentia flagelli et cirri vestigialis bene recedit, *C. insigni* Griff. et speciebus affinis Peninsulae Malayanae simulans, *C. penicillato* Roxb. simillima sed cirri vestigiale spinis aciculiformibus differt. Typus: Laos, *Khamphone Sengdala* 368 (holotypus K, isotypus FRCL).

Slender, clustering, scrambling, flagellate and usually subcirrate rattan to at least 3 m. Stem without sheath c. 3–4 mm diam., with sheath c. 5–10 mm. Leaf 0.3–0.5 m long, usually continued into a rudimentary cirrus reaching an additional 5–15 cm, sheath green with patches of brown indumentum, spines few (or wholly absent, *Sounthone Ketphanh* 7), scattered, green-based with dark tips, 1–7 mm, base slightly swollen, tip acicular and horizontal or slightly deflexed, ocrea tiny, unarmed, marcescent; knee present, petiole of upper leaves 8–15 cm, adaxially flat or with slight longitudinal ridges, sometimes with one or two recurved spines, abaxially rounded, rachis acutely bifaced and unarmed adaxially, abaxially rounded and bearing scattered short, recurved, dark-tipped spines; leaflets lanceolate, 10–15 × 1.5–2.6 cm, 4–6 on each side, mostly approximate in pairs but with the basal ones often solitary, if cirrus absent, rachis usually ends with a single, reduced, isolated, asymmetrical leaflet with the main costa strongly clawed abaxially but rarely ends in a symmetrical pair of leaflets connate about 30%, adaxially 3 prominent naked costae, abaxially 3–5 sub-prominent naked costae, leaflet margins naked or with a

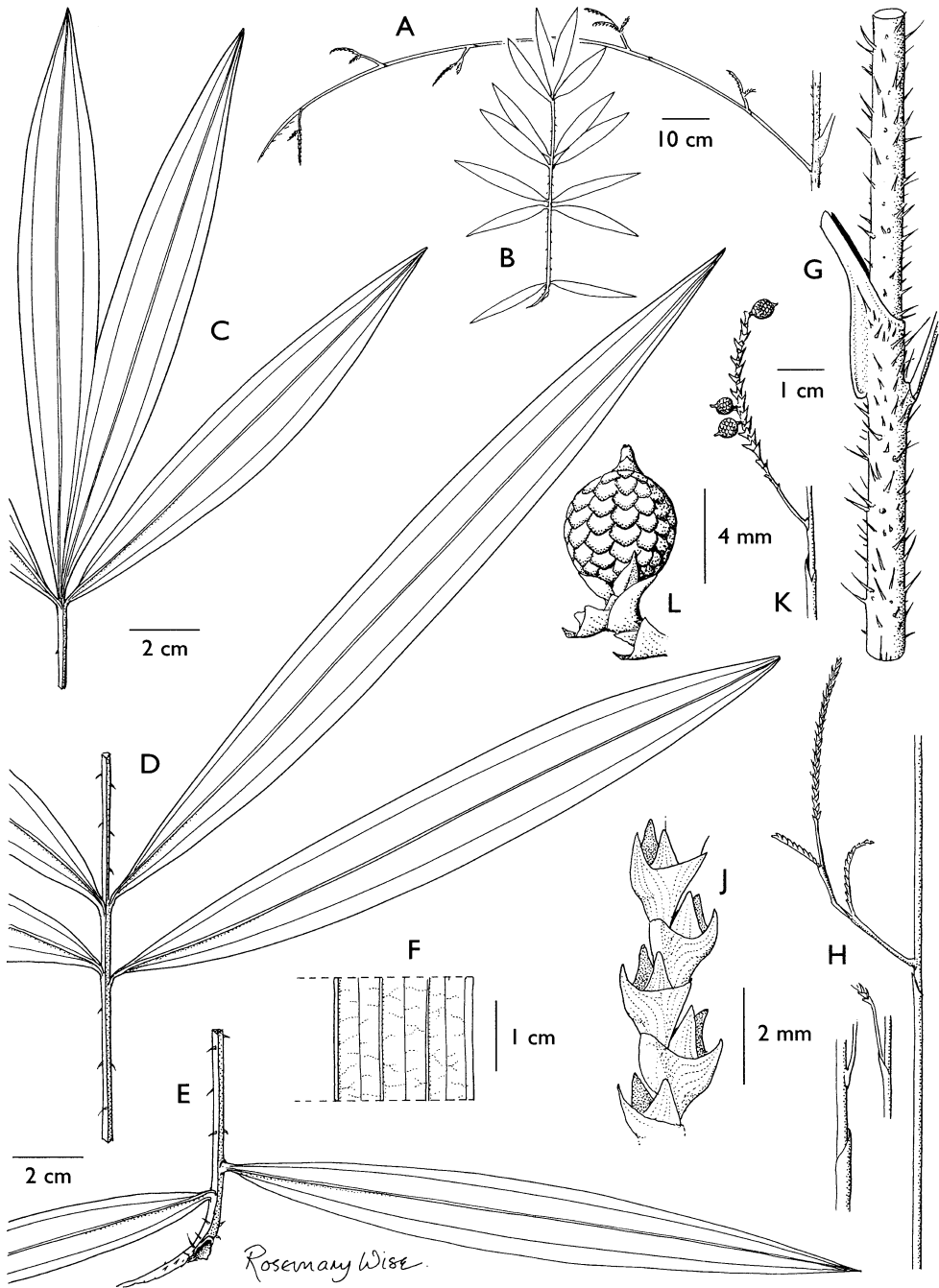


FIG 3. *Calamus pauciflorus*. A male inflorescence habit; B leaf; C leaf tip; D leaf (middle part); E petiole; F leaflet surface; G sheath; H male partial inflorescence (three examples, showing variation in position of primary branch relative to primary bract mouth); J male rachilla (part); K female rachilla; L immature fruit. A – K from *Khamphone Sengdala* 323; L from *Khamphone Sengdala* 324. Drawn by Rosemary Wise.