Sphaerobambos, a New Genus of Bamboo (Gramineae-Bambusoideae) from Malesia
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Sphaerobambos, a new genus of bamboo *(Gramineae-Bambusoideae)* from Malesia

SOEJATMI DRANSFIELD

Summary. A new genus of bamboo, *Sphaerobambos* S. Dransf. *(Gramineae-Bambusoideae)*, is described from Malesia, consisting of three species: *S. hirsuta* S. Dransf., the type species from Sabah, Borneo, *S. subtilis* S. Dransf. from North Sulawesi, and *S. philippinensis* (Gamble) S. Dransf., comb. nov., transferred from *Guadua*. The genus is related to *Dinochloa* Büse and *Bambusa* Schreb.

In preparing an account of the bamboos of Sabah, East Malaysia, I was unable to decide to which genus one sterile specimen (*Tiong* SAN 88660) belonged. It was collected from Lohan village near Ranau. In 1979 when I went collecting around Ranau, I did in fact see bamboo clumps on a small hill near Lohan village but made no collections; from a distance this bamboo looks like *Schizostachyum blumei* Nees or *S. latifolium* Gamble which are common in the area. In February 1986 I revisited the areas near Telupid and Ranau together with Mr P. S. Shim (SAFODA) and Mr K. M. Wong (then of FRIM, Kepong). We stopped and collected the bamboo I saw in 1979, in a sterile state; it matches *Tiong* SAN 88660. I still could not place it in any known genus. It is a scrambling bamboo; the culm has thin walls and the branches are many at each node with the primary branch dominant. These primary branches are not always dormant, some developing and elongating to become as large as the main culm and behaving like it by producing branches at each node. The sheaths of young culm-shoots and of young primary branches are hairy and have very narrow, almost inconspicuous rugose bases. The plant looks like a species of *Dinochloa*, but the culms do not climb and are only slightly zig-zag. Later on that day we came to the much-disturbed Lohan River, and found near the rocky river bank a bamboo clump about 6 m tall with a few erect culms and with flowers and fruits. This matched the sterile bamboo collected earlier. The inflorescence is composed of pseudospikelets, the spikelet consisting of several florets like that of *Bambusa*. The fruit is globose with a large embryo resembling that of *Dinochloa* but the plumule and radicle are basal rather than lateral. The palea is longer than the lemma in the mature spikelet, 2-keeled with narrow wings along the keels such as can be found in some species of *Guadua* from the New World. The anthers have apiculate tips. Later I found that one of the leafy branches of the first collection bore a young inflorescence. These features indicate that this bamboo belongs to an undescribed genus which I propose to name *Sphaerobambos*, with *S. hirsuta* as the type species. *Sphaerobambos* is apparently related to *Dinochloa* and *Melocalamus* by the structure of the fruit. It differs from both genera in having multi-flowered spikelets. Without fruit *Sphaerobambos* can be easily confused with *Bambusa* by having multi-flowered spikelets. It differs from the latter, however, by having the palea longer than the lemma and the keels of the palea winged (Table 1). The examination of other specimens from neighbouring islands deposited in the Herbarium at

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TABLE 1. Differences between *Sphaerobambos* and related genera

	Bambusa	*Sphaerobambos*	*Melocalamus*	*Dinochloa*
Habit	erect or scrambling	erect or scrambling	climbing	climbing
Culm	usually straight	straight or slightly zig-zag	?slightly zig-zag	zig-zag
Base of culm-sheath	not modified	not obviously smooth	less prominent, rugose	prominent usually rugose
Spikelet	usually multi-flowered	multi-flowered	2-flowered	1-flowered
Palea	2-keeled, keels not winged, shorter than lemma	2-keeled, keels winged, longer than lemma	slightly keeled, as long as lemma	not keeled as long as lemma
Fruit	caryopsis endosperm present	globose berry endosperm vestigial	globose berry endosperm vestigial	globose berry endosperm vestigial
Embryo	small with small scutellum	large with large scutellum full of starch	large with large scutellum full of starch	large with large scutellum full of starch
Plumule and radicle	basal	basal	apical	lateral

Kew showed that two more species are congeneric. The first one is *Guadua philippinensis* Gamble from Mindanao. (*Guadua* Kunth is a New World genus of about 25 species; the palea has winged keels.) There is no fruit in the only specimen of this species, but other structures indicate its relationship with *Sphaerobambos hirsuta*. The palea is longer than the lemma with winged keels and the anthers have apiculate tips. In those *Guadua* species in which the palea is slightly longer than the lemma the anthers have blunt (not apiculate) tips. Usually I would not employ the apiculate tip of the anther as a character to distinguish genera, but am forced to do so in the absence of fruit. When Gamble (1910) described this bamboo he stated that 'when ripe or more advanced fruit is obtained it may be necessary to alter its position and genus'. I will certainly follow Gamble.

The other species is from North Sulawesi and again no fruit is available. The spikelets are much smaller than those of the other two species, but spikelet structure nevertheless indicates its affinity. I propose to name this species *S. subtilis*.

Previously I have suggested (Dransfield, 1981) that the internal structure of the fruit in the four genera *Dinochloa, Melocalamus, Melocanna* and *Ochlandra*,

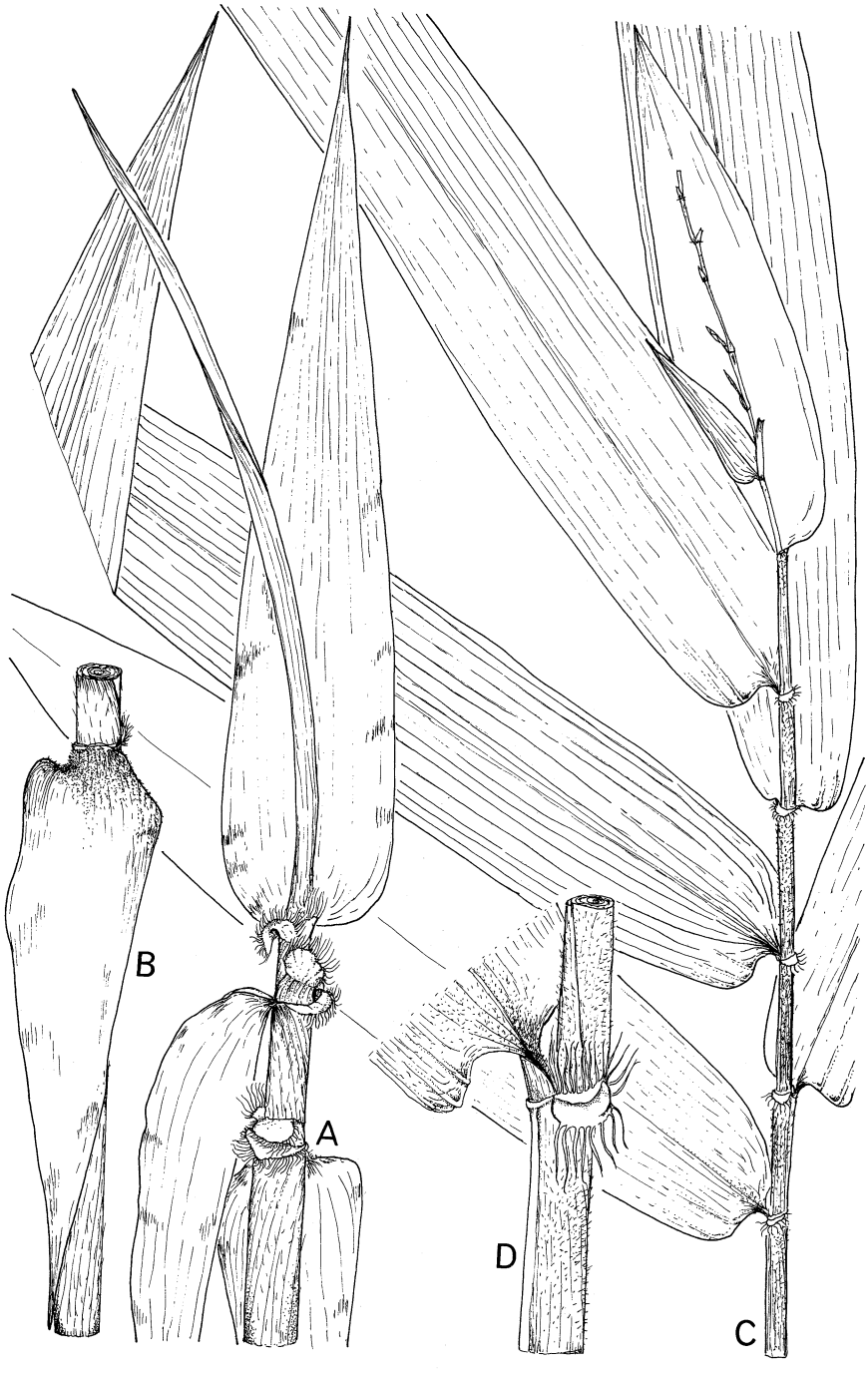

FIG. 1. *Sphaerobambos hirsuta*. **A** young shoot × ⅔; **B** culm-sheath × ⅔; **C** leafy branch × ⅔; **D** base of leaf-blade × 2. All from *S. Dransfield* SD 843. Drawn by the author.

show that they are related to each other. In fact the internal structure is not quite the same (Rudall & Dransfield, 1989). I regard *Dinochloa* and *Melocalamus* as belonging to a group different from the group of *Melocanna* and *Ochlandra*, as suggsted by Holttum (1956).

Sphaerobambos *S. Dransf.* genus novum quoad structuram internam fructus *Dinochloae* Büse affinis, sed culmis erecto-patentibus vel ascendentibus, spiculis pluri-floriferis, palea lemmate longiore plerumque carinis alatis, embryone plumula et radicula basali differt. Typus: *S. hirsuta* S. Dransf.

Sympodial, erect or scandent bamboos; culms straight or slightly zig-zag, usually with relatively thin walls; branches few to many at each node, with primary branch dominant especially at the lower nodes, at the upper nodes not so or often dormant. Inflorescence a compound panicle, iterauctant (indeterminate), flowering branches borne on leafless or leafy culms; pseudospikelets few in a group at each node of the flowering branches, each bearing 1–2 basal buds; the true spikelet with a short or long pedicel, 3–5-flowered, more or less laterally compressed, rhachilla internodes slender, glumes usually 3; in mature spikelet palea longer than lemma, 2-keeled, keels usually winged; stamens 6, filaments free, anthers with apiculate tips; ovary with long hairy styles and 3 stigmas. Mature fruit globose, pericarp relatively thick, endosperm not prominently present, embryo filling the cavity with a large scutellum full of starch grains, plumule and radicle basal.

KEY TO THE SPECIES OF SPHAEROBAMBOS

1. Spikelets small, 8 mm long; palea glabrous on the back; axes of the inflorescence glabrous ..... **3. S. subtilis**
   Spikelets longer, 15 mm long; palea hairy on the back; axes of the inflorescence hairy 2
2. Culm-sheaths glabrous, blades erect, glabrous or glabrescent, ligule toothed with long bristles; auricules small, erect **2. S. philippinensis**
   Culm-sheaths covered with stiff white hairs, blades erect first then deflexed, hairy adaxially; ligule entire; auricles large with long bristles, erect or deflexed (folded) ..... **1. S. hirsuta**

1. S. hirsuta *S. Dransf.* sp. nov. Culmi et rami juventute pilis pallide-brunneis dense tecti; vaginae culmorum et internodii aetate glabriusculi; vaginarum culmorum laminae initio erectae tum versus basim deflexae, pilosae, auriculis magnis setis fimbriatis; inflorescentiae axes pubescentes; spicula 15 mm longa, palea dorso puberula; fructus globosus laevis 6 mm diametro. Typus: Borneo. *S. Dransfield* SD 844 (holotypus K).

Clump tufted, open; culms about 10 m long, arching or drooping to the ground, slightly zig-zag; internodes up to 40 cm long, 3–4 cm diam., thin-walled, rough and hairy when young, smooth and glabrous later. Young shoots green with thin white wax and stiff pale brown hairs. Culm-sheaths up to 20 cm long, rough and densely hairy when young, becoming glabrous, hairs stiff and irritant, easily shed; blades erect at first then deflexed, 10–25 cm long, up to 6 cm wide at the base, tapering to the tip, hairy adaxially especially near the base; ligule short, 1 mm, entire; auricles large, 7 mm long, 2–2·5 cm wide with bristles 6–7 mm long along the margin. Leaf-blades 11–23 × 3–4 cm, base rounded, tapering, pubescent on both surfaces, dense-

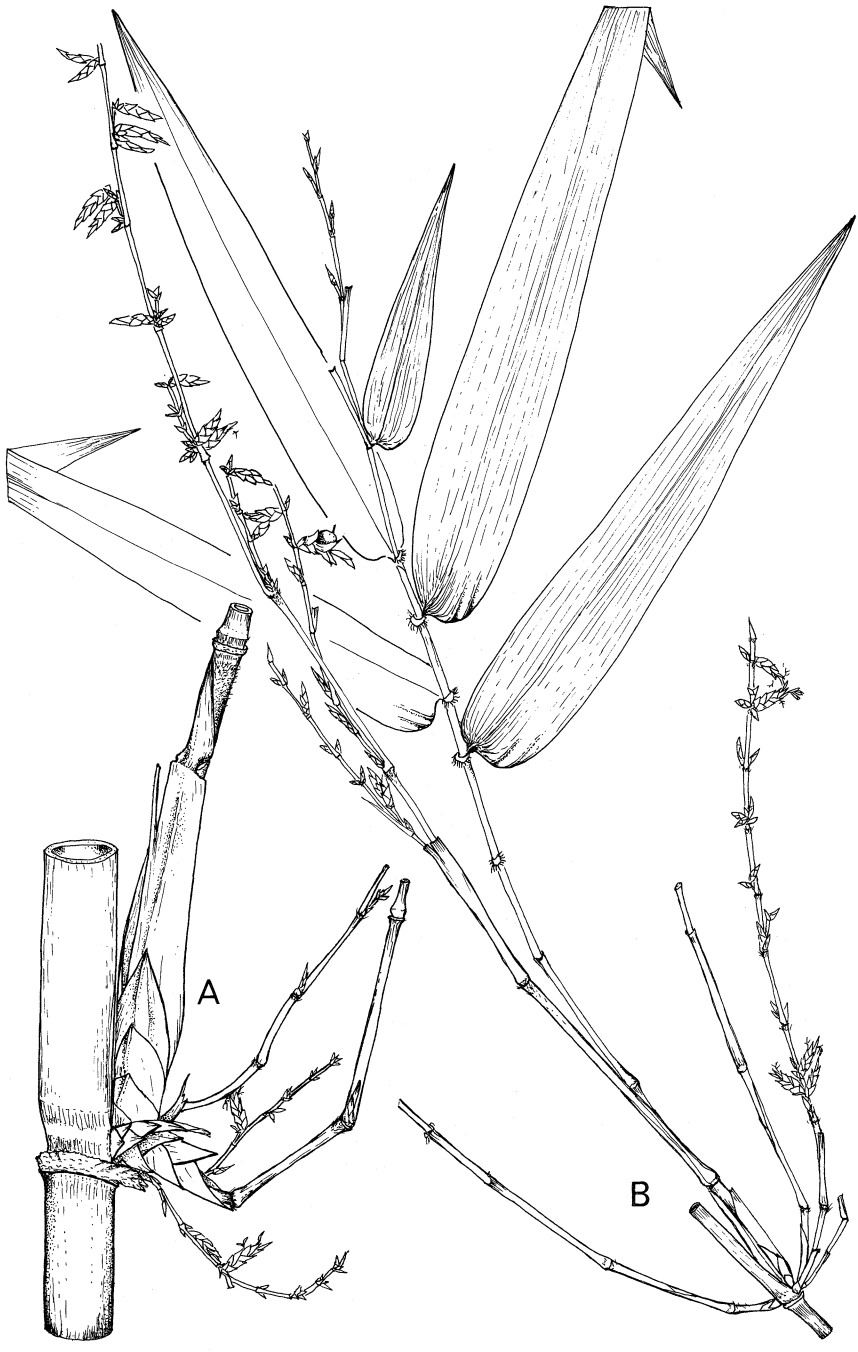

FIG. 2. *Sphaerobambos hirsuta*. **A** branch complement × $\frac{2}{3}$; **B** leafy and flowering branches × $\frac{2}{3}$; All from *S. Dransfield* SD 844. Drawn by the author.

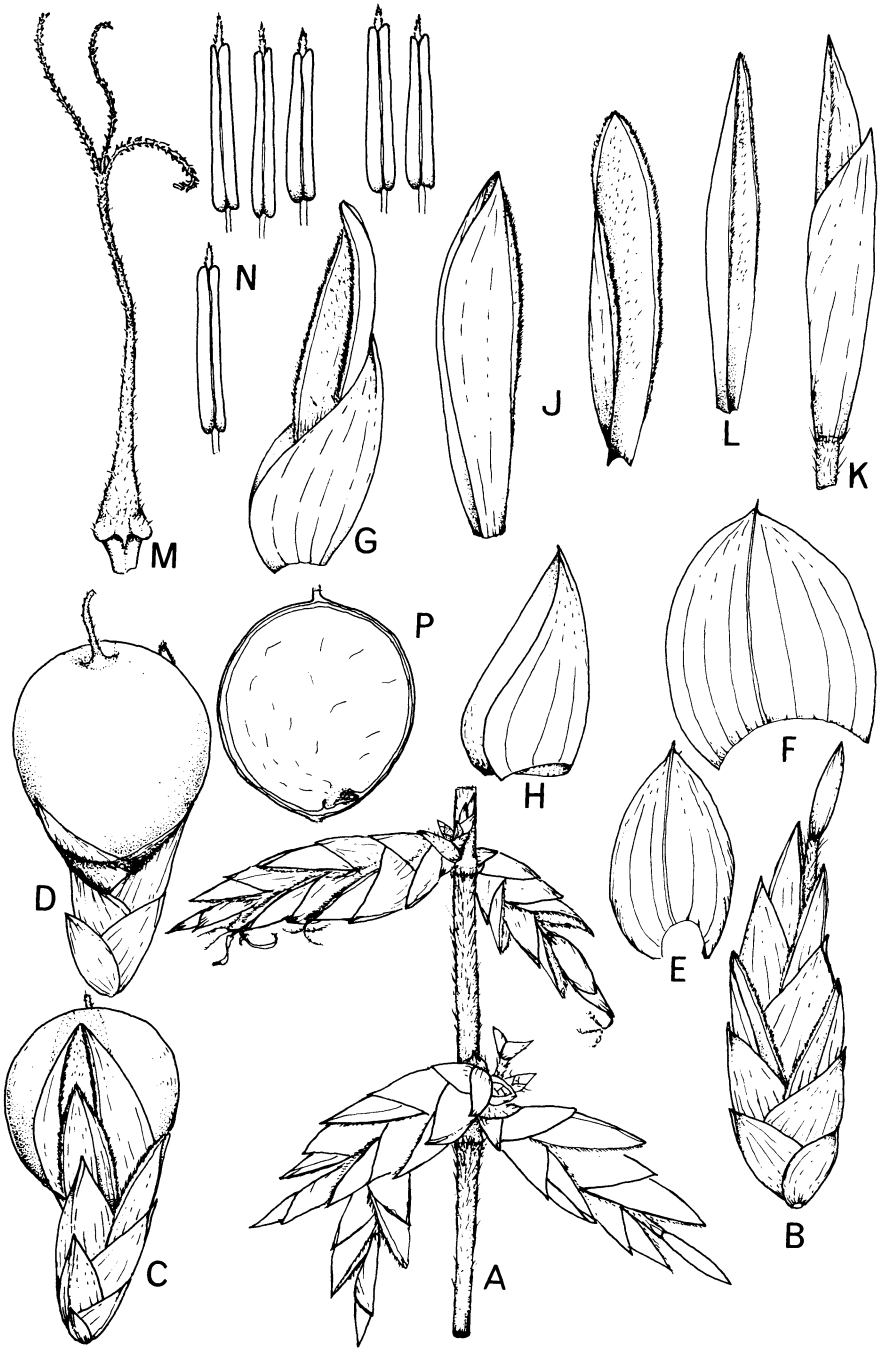

FIG. 3. *Sphaerobambos hirsuta*. **A** part of flowering branch × 3; **B** spikelet × 2; **C, D** spikelet with fruit × 3; **E** glume II × 5; **F** glume III × 5; **G** floret × 7; **H** lemma × 7; **J** palea (two views) × 7; **K** uppermost floret × 7; **L** palea of uppermost floret × 7; **M** ovary × 10; **N** stamens × 10; **P** section of fruit × 3. All from *S. Dransfield* SD 844. Drawn by the author.

FIG. 4. *Sphaerobambos philippinensis*. **A** young shoot × $\frac{2}{3}$; **B** culm-sheath, viewed from the inside showing the ligule × $\frac{2}{3}$; **C** leafy branch × $\frac{2}{3}$; **D** leafy branch terminated by an inflorescence × $\frac{2}{3}$; **E** part of flowering branch × $\frac{2}{3}$; **F, G** spikelet, two views showing the palea visible from one side only × 4; **H** lemma × 5; **J** palea × 5; **K** ovary × 9. All from *Piper* 475. Drawn by the author.

ly hairy near the base and on the stalk, sheaths densely hairy, auricles 5 mm long, with bristles to 6 mm long, ligule short, laciniate. Inflorescence axes pubescent. Spikelets (mature) about 15 mm long, 5-flowered, uppermost floret much smaller than the others; glumes 3, apex acute or obtuse, pubescent to glabrescent on the back, the lower 7-nerved, others 9-nerved; rhachilla internodes slender, hairy, 2–5 mm long (uppermost the longest); lemmas 3·5–5 × 4 mm, glabrescent, acute, 9-nerved, that of the uppermost floret with 7 (or fewer) nerves; paleas 6–7 × 3 mm, 2-keeled, keels winged, ciliate along the keels, hairy on the back especially between the keels, 2 nerves between the keels, 2 nerves on each side between the keel and the margin; ovary about 7 mm long; fruits globose, about 6 mm in diameter. (Figs. 1, 2, 3).

HABITAT ETC. Forest margins on ultramafic soil. So far known only from one small area, near Mt Kinabalu.

BORNEO. Sabah. Ranau, Lohan, 11 April 1978, *K. K. Tiong* SAN 88660 (K, L, SAN); on small hill by road from Ranau to Poring, very common, sterile, 27 Feb. 1986, *S. Dransfield* SD 843 (K, SAN); Lohan River, only one clump, flowering and fruiting, 27 Feb. 1986, *S. Dransfield* SD 844 (holotype K; isotype SAN) & *K. M. Wong* FRI 35154 (K, KEP).

The type was collected from a clump which probably no longer exists.

2. S. philippinensis *(Gamble) S. Dransf.* comb. nov.

Guadua philippinensis Gamble, Phil. J. Sci. Bot. 8(4): 203: (1910). Type: Mindanao, *C. V. Piper* 475 (holotype K).

Bambusa philippinenis (Gamble) McClure, Smithsonian Contrib. Bot. 9: 68(1973).

Culms 4–6 m tall, to 5 cm diam.; internodes 60–70 cm long, thin walled, smooth. Young shoots glabrous. Culm-sheaths glabrous and smooth, about 9 cm long; blades erect, ovate-lanceolate, tapering, 6–16 cm long, about 26 mm wide at the base, glabrous or glabrescent abaxially; ligule short but with long bristles; auricles 2 mm long with long bristles. Leaf-blades 10–17 × 1·5 cm (on flowering branches), base rounded, glabrous, auricles very short with long bristles, ligule short with long bristles. Inflorescence axes pubescent. Spikelets about 15 mm long; lemmas 6 mm long, glabrous; paleas 8 mm long, hairy on the back betweeen the keels and on the keels. Fruit not seen. (Fig. 4).

MINDANAO. Distr. of Davao, Mati, 15 May 1911, *C. V. Piper* 475 (K, PNH).

It is interesting to note that the position of the paleas in the laterally compressed spikelet is such that in a mature spikelet they can be seen protruding from the floret only from one side of the spikelet. (Figs. 4F–G).

3. S. subtilis *S. Dransf.* sp. nov. spicula minore, palea glabra, inflorescentia moderate grandi congeneribus diversa. Typus: Sulawesi, *Eyma* 3436 (holotypus K).

Graceful bamboo; internodes smooth, hollow with thin walls, diameter 3–4 mm; secondary branches 20–24 at each node, primary branch dominant or primary branch bud dormant especially at the upper part of the culm.

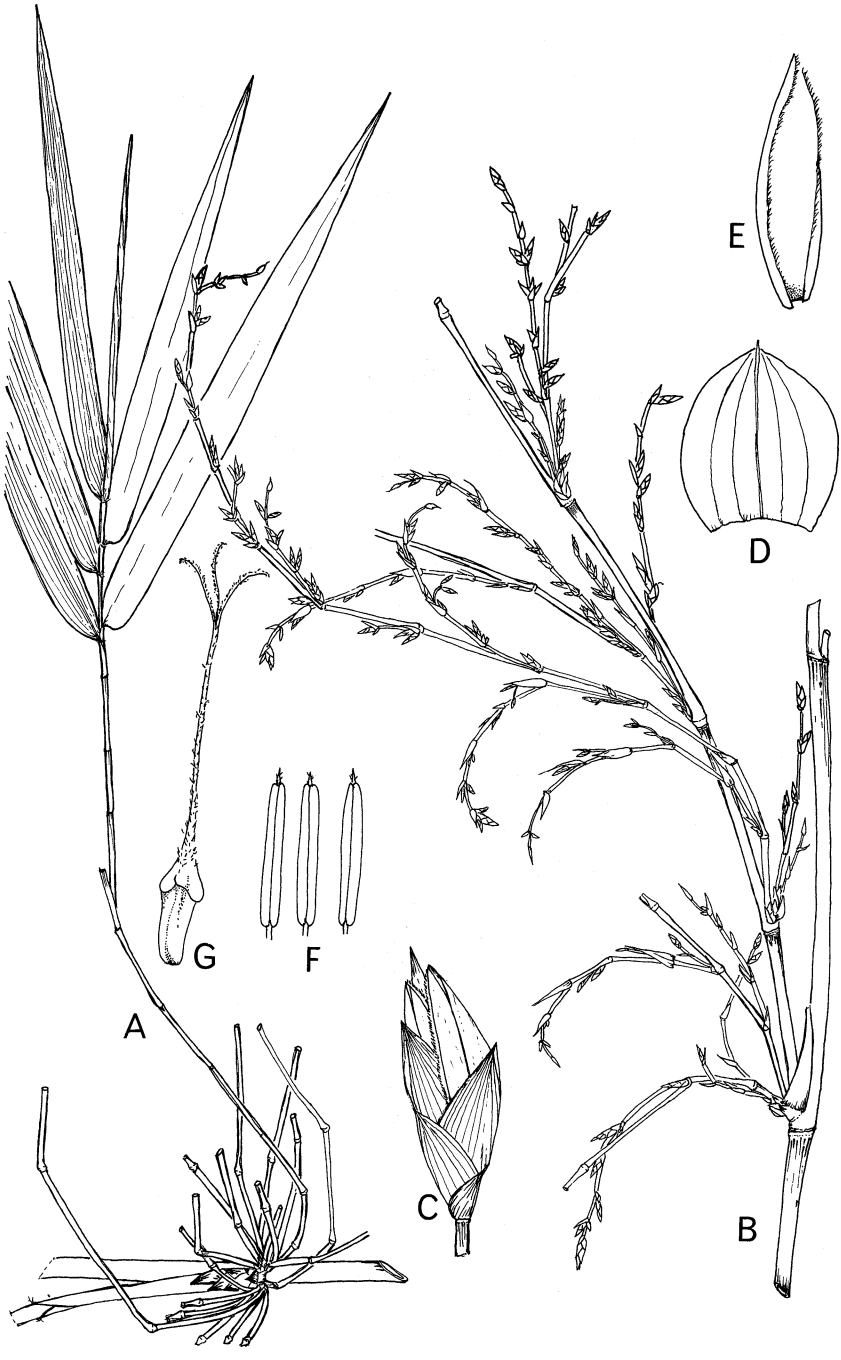

FIG. 5. *Sphaerobambos subtilis*. **A** leafy branch × ⅔; **B** part of flowering branch × ⅔; **C** spikelet × 6; **D** lemma × 6; **E** palea × 6; **F** stamens × 9; **G** ovary × 9. All from *Eyma* 3426. Drawn by the author.

Culm-sheaths not available, but sheaths on the dominant branch glabrous with a small erect blade. Leaf-blades 10–13 × 0·7–1 cm, glabrous above, pubescent below or one side of the midrib pubescent, the other side glabrous but rough because of the presence of prickle-hairs, base slightly rounded; sheaths glabrescent, auricles small, easily shed, with bristles. Inflorescence a much-branched leafless flowering branch of about 75 cm long (only part seen), axes glabrous; spikelets (3)4-flowered with the uppermost reduced, 6–8 mm long; lemmas 3–3·5 mm long, glabrous, with pointed tips, 5(–7)-nerved; palea about 4·5 mm long (in mature spikelet), glabrous, keels narrowly winged, margins and keels ciliolate, nerves 2 between the keels, 2 on each side between the keel and margin; anthers with apiculate tips; ovary with long hairy style and 3 stigmas. Fruit not seen. (Fig. 5).

SULAWESI. Menado, between Kolomadale and Wiu, 19 Aug. 1938, *Eyma* 3436 (holotype K; isotypes BO, L).

Because of the structure of the spikelet I include this bamboo in *Sphaerobambos*, despite the absence of the fruit; none of the duplicates has fruit.

In the iterauctant (indeterminate) inflorescence of bamboos the ultimate unit is called a pseudospikelet (McClure 1935) consisting of a prophyll at the base followed by one or more sheaths or bracts each enclosing a bud, and a true spikelet terminating it. The rhachis internodes are usually very short. In *S. subtilis*, however, the pseudospikelet has sometimes an elongated internode below the true spikelet as if this spikelet is borne on a pedicel-like structure.

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