

## A TAXONOMIC REVISION OF BUERGERSIOCHLOA PILG. (GRAMINEAE)

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*Buergersiochloa* was described by Pilger in 1914 with *B. bambusoides* as the only species. A second species was added by S. T. Blake in 1946. Very little is known about this genus; the plants appear to be very rare in lowland primary forests of New Guinea and only 11 collections are presently known, nine of which were directly available for this study, while of a tenth extensive descriptions and drawings have been published.

As was already pointed out by Pilger *Buergersiochloa* is evidently related to *Olyra* Linné. Phytogeographically this is very interesting, as *Olyra* belongs to the *Olyreae*, a tribe of the *Bambusoideae* practically restricted to the forests of Central- and South America. Only *O. latifolia* Linné is found also in Africa and Madagascar (probably not in the Mascarenes as indicated by Hubbard, 1959). Some have included the genera *Pharus* Linné and *Leptaspis* R. Br. in the *Olyreae* (e.g. Pilger, 1954), the latter genus occurring in New Guinea also, but Hubbard (1959) and Jacques-Félix (1962) have convincingly demonstrated that these genera belong to a separate tribe, the *Phareae*. Calderón & Soderstrom (1973) have even excluded it from the *Bambusoideae*.

S. T. Blake (1946) had only a single collection available (*L. S. Smith 166*; BRI, *n.v.*), apart from the descriptions and figures published by Pilger. From this he concluded that not only did he have a different species before him but also that there were good reasons for creating a separate tribe, the *Buergersiochloae*, for the genus. He said that it differed from the *Olyreae* by having all veins of the leaves parallel and without cross-veins; by having long-awned female lemmas, which are scarcely at all indurated and much longer than the glumes; and by having united filaments in the male spikelets.

About the first character it may be said, that all *Olyreae* have this type of venation (but not the *Phareae*, where the leaves are pinninerved with cross-veins). In some specimens of *Buergersiochloa* the cross-veins may be obscured by the thick mesophyll. As far as the last character mentioned by Blake is concerned, fused filaments rarely occur in *Olyra* also, e.g. in *O. obliquifolia* Steud. (*Kuyper 15703*; L). A remark on the usefulness of this character in the related *Bambuseae* by Holttum (1967) seems applicable here: 'United filaments by itself has no value as a criterion for generic (!) assignment. Pairs of species can be found in which one has the filaments joined, the other free, but agreeing in most other characters'. Finally, the structure of ripe female lemmas cannot be stated with certainty, as neither Blake nor I had ripe fruits available. Comparison with *Olyra* shows that there the induration of the female lemma takes place in an early stage of anthesis. In *Buergersiochloa* these lemmas apparently remain chartaceous. Blake in one place says 'tenuiter coriacea' and 'thinly coriaceous', but elsewhere 'scarcely at all indurated'. Henty (1969) says 'thickly coriaceous', but this is not seen in the Lae specimens studied by him. It is, however, here considered that lack of induration and relative size of these lemmas offer insufficient grounds for the delimitation of a separate tribe for a single genus, but they are sufficient to regard *Buergersiochloa* as distinct from all other *Olyreae*.

S. T. Blake distinguished *B. macrophylla* from *B. bambusoides* by the following characters: leaves longer and much narrower, 6-8 times as long as broad (vs. *c.* 4 times), with margins nearly parallel for a considerable part of their length; panicle continuous, narrower; male spikelets much longer awned; female spikelets much longer with longer awns, relatively shorter glumes, and less hairy lemmas and paleas; lodicules three; style not divided at base; anthers apparently only two.

From the specimens seen it has become clear that these characters fall within the vari-

ability of a single species. Pilger's drawing of the panicle of *Ledermann 8276* (B) is misleading, as could be observed from the actual specimen, which has continuous, not semi-interrupted panicles. The lodicules are three in all specimens, including Pilger's. The third lodicule may sometimes be reduced and was therefore probably overlooked by him. The separation of the styles at base described and figured by Pilger is an artefact, as the connecting tissue is very thin and may tear in dissecting. At first the number of anthers per male spikelet seemed to offer a good distinctive character, but later it was discovered that in panicles with three-anthered spikelets always some two-anthered ones occurred and vice versa, whereby this character is invalidated. It was therefore concluded that only one species is involved.

Representatives of several related genera were studied, as well as the literature of those of which no material was available. Among the latter was a genus described as *Bulbulus* by Swallen (1964). This name is inadmissible under the Code, as it is a technical term, comparable to *Radicula*, which is given as an example in the pertinent article (Art. 20). It can furthermore be considered as an orthographic variant and thus a later homonym of *Bulbilis* Raf. (1819) and therefore to be rejected also (Art. 64). A new name is required and is proposed here: *Rehia*\* Fijten, *nom. nov.*, based on *Bulbulus* Swallen, *Phytologia* 11 (1964) 154, *non Bulbilis* Raf. (1819), with as the only species *R. nervata* (Swallen) Fijten *comb. nov.* (*B. nervatus* Swallen, l.c.).

\*) This genus is dedicated to Dr. R. E. Holttum, Kew, on occasion of his 80th birthday in recognition of his interest in and work on the bamboos.

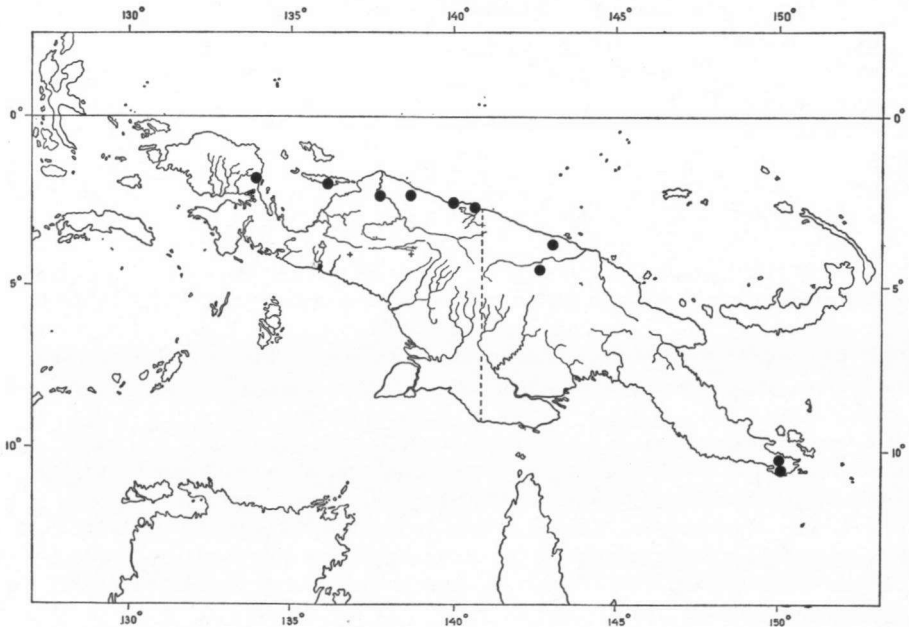


Fig. 1. Localities of *Buergersiochloa bambusoides* Pilg.

In conclusion I take the opportunity to thank the Rijksherbarium, Leiden, for extending its facilities to make this study possible, and especially Dr. J. F. Veldkamp for his critical assistance.

### BUERGERSIOCHLOA

*Buergersiochloa* Pilg., Bot. Jahrb. 52 (1914) 167; S. T. Blake, Blumea Suppl. 3 (1946) 59; Pilg., Bot. Jahrb. 76 (1954) 352; Henty, Bot. Bull. Lae 1 (1969) 43. — T y p e s p e c i e s: *B. bambusoides* Pilg.

Small, tufted, bambusoid, monoecious, glabrous perennials with scaly extravaginally branching rhizomes and sterile and fertile culms. Sterile culms leafy. *Ligules* a row of cilia, occasionally a membranous rim with ciliate margins; auricles with a row of long hairs. *Blades* pseudo-petiolate, ovate-lanceolate, base cuneate, apex acute to acuminate, nerves many, parallel, with cross-veins. Fertile culms with cataphylls only. *Panicle* rather dense, branches in lateral grouplets, erecto-patent, scaberulous to puberulous, the lower ♂, the upper ♀. *Spikelets* 1-flowered, cylindric. ♂ *Spikelets* with much-reduced, inconspicuous, scale-like glumes. *Lemmas* acuminate to awned, 3-nerved, ± glabrous, herbaceous. *Paleas* rounded, faintly 2-nerved, acute, ± glabrous, herbaceous. *Lodicules* 3, reduced. *Stamens* 2 or 3, filaments free before anthesis, base later elongating, forming a staminal tube. *Pistillodium* present. ♀ *Spikelets* with 2 subequal, 3—7-nerved, rounded glumes. *Rachilla* articulate below lemma, not prolonged. *Callus* minute, very shortly bearded. *Lemmas* longer than glumes, awned, strongly involute, 5—7-nerved, pergamentaceous (becoming coriaceous?), pubescent. *Paleas* rounded, faintly 2-nerved, pubescent. *Lodicules* 3, olyroid, upper margin with micro-hairs, 2- or 3-nerved. *Staminodes* 3, often with reduced anthers. *Ovary* glabrous; styles 2, fused, sometimes at base with remnant of a third; stigmas 2, feathery. *Caryopsis* not known mature, apparently cylindric with longitudinal furrow (hilum?).

**D i s t r i b u t i o n:** One species, endemic in lowland primary forests of New Guinea. See map.

#### 1. *Buergersiochloa bambusoides* Pilg.

*B. bambusoides* Pilg., Bot. Jahrb. 52 (1914) 168, fig. 1; Ohwi, Bot. Mag. Tokyo 56 (1942) 3; Henty, Bot. Bull. Lae 1 (1969) 43. — T y p e: *Ledermann 8276* (B, holo; BM, n.v.; K).

*B. macrophylla* S. T. Blake, Blumea Suppl. 3 (1946) 59, fig. 2; Henty, Bot. Bull. Lae 1 (1969) 43. — T y p e: *L. S. Smith 166* (BRI, holo, n.v.).

Culms to 1 m high, smooth to slightly scaberulous. *Sterile culms* with 5—7 cataphylls at base, the lower stiff, shiny, yellowish, scaly, the upper 2 or 3 with long sheaths. *Leaves* 1—9. Sheaths smooth. *Ligules* 0.2—1.3 mm high. Pseudopetioles 1—3 mm long. *Blades* 6.5—27 by 1.4—5.5 cm, margins apically scaberulous, otherwise smooth, shiny above, dull beneath. *Fertile culms* with up to 8 cataphylls like those on the sterile culms. *Panicles* 7—21 by 1.3—5.5 cm, greenish to purplish. Branches 1—3 together, longest basal one 3—5 cm long. ♂ *Spikelets* 2.7—4.4 mm long. *Lemmas* 2.7—4.2 mm long, awns up to 25 mm long; *paleas* 2.5—4.2 mm long. *Lodicules* c. 0.5 mm long, brownish (*i.s.*). *Anthers* 1.2—4.2 mm long, yellowish (*i.s.*). ♀ *Spikelets* 4—9 mm long. *Glumes* elliptic, 3.1—7.1 mm long; *callus* c. 0.8 mm long; *lemmas* 4.2—8.8 mm long, awns 5—30 mm long, hairs ascendingly appressed; *paleas* 4.2—8 mm long. *Lodicules* often unequal, central one smallest, all obovate, 0.5—1.3 mm long, laterals with oblique triangular apex, the central one acuminate. *Staminodes* 0.3—0.5 mm long. *Caryopses* (unripe) up to 5.6 by 0.8 mm.

**D i s t r i b u t i o n:** As the genus.

**E c o l o g y:** Moist slopes and rock walls in primary light rain-forest (e.g. with *Pasania* and *Castanopsis acuminatissima*, fide L. S. Smith 166), on rocky soil with springs or seepage water or on shallow, brown, sandy loam. Up to 600 m altitude, usually less. Locally rare to unique (R. Pullen, or. comm.), once recorded as plentiful (*Docters v. Leeuwen 9077*).

**NEW GUINEA.** Vogelkop. Mumi, *Kanehira & Hatusima 13254* (FU, n.v.). — **J a p e n.** Papoma nr. Serui, *Aet & Idjan 676* (BO, L) *karemiri*. — **N o r t h I r i a n J a y a.** Albatros Bivak, Mamberamo R., *Docters v. Leeuwen 9077* (BO, L; NY, n.v.); Tor R., *Cjellerup 773* (K; U, n.v.); Kp. Maribu, S. of Depapre nr. Jayapura, *Lam 7804* (L); Jayapura, *Kostermans 389* (BO). — **S e p i k D i s t.** SE. side of Mt. Turu, Pr. Alexander Ra., *Pullen 1508* (CANB); Hunstein R., *Hoogland & Craven 10779* (CANB, LAE) *amaingi* (Waskuk), *yosin* (Wagu); Hunstein Ra., *Ledermann 8276* (B; BM, n.v.; K). — **M i l n e B a y D i s t.** Mapo, L. S. Smith 166 (BRI, n.v.); S. coast nr. Baxter Harbour, *Pajmans 1043* (CANB).

**N o t e s:** 1. Only after the proofs of this article were received a discussion by Soderstrom & Calderón (*Biotropica* 6, 1974: 141—153) on the delimitation of the *Olyreae* came to my attention. *Buergersiochloa* agrees in most characters with the *Olyreae*, but differs by the orally setose sheaths, the anthoecia being longer than the glumes, the awned lemmas, and the probably non-indurate ♀ anthoecia. The oral setae and non-indurate anthoecia are common Bambusoid characters, lost in the other *Olyreae*, and *Buergersiochloa* is most primitive in these. The false awns have been evolved independently in many grasses and is a derived character here also. Within the *Olyreae* the genus *Diandrolyra* Stapf is considered as very primitive, because of the presence of for instance three well-developed staminodes in the ♀ anthoecia and three stigmata, features also found in *Buergersiochloa*. *Diandrolyra* furthermore seems to have anthoecia slightly longer than the glumes, cf. fig. 5a, 5d. The presence of two or three anthers in both genera is possibly mere coincidence. *Buergersiochloa* is thus a very primitive member of the *Olyreae*.

2. Another collection of *B. bambusoides* not marked on the map is BW 7695 (Schram), Wariki, ca. 50 km W. of Manokwari, Vogelkop (L).
3. Erratum: p. 415, lines 22—24, replace by: 'Cross-veins are always present in *Buergersiochloa*, but may be obscured by the closely set veins or the thick mesophyll. The *Olyreae* always have parallel-nerved leaves; in the *Phareae* they are pinninerved'. — J. F. Veldkamp.

#### LITERATURE

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