FOUR NEW GENERA IN CYPERACEAE-CYPEROIDEAE

A. A. OTENG-YEBOAH*

ABSTRACT. Three species of *Scirpus* and one of *Blysmus* are segregated and recognised, mainly on anatomical evidence, as four new monotypic genera in Cyperaceae subfamily Cyperoideae. The three species of *Scirpus*, viz.: *S. junghuhnii* Miq., *S. nevadensis* Watson and *S. inanis* Thunb., constitute the new genera *Sumatroscirpus*, *Amphiscirpus* and *Pseudoschoenus* respectively; *Blysmus rufus* (Huds.) Link constitutes the new genus *Blysmopsis*.

INTRODUCTION

During the preparation of a Ph.D. thesis submitted to the University of Edinburgh in October 1972, the various classifications of the large Linnaean genus *Scirpus* and its related genera in the tribe Scirpeae were reviewed. This review involved the broad survey of the morphology and anatomy of the species that form these genera. Four species, three of *Scirpus* and one of *Blysmus*, differed, especially in their anatomy, from the rest of the species in the respective genera, and were considered to constitute distinct monotypic genera described below.

The main observations and conclusions of the whole review are being published elsewhere.

Sumatroscirpus Oteng-Yeboah, **gen. nov.**

Habitu et inflorescentia affinis *Scirpo* L. sed characteribus anatomicis bene differt.

Herba perennis, rhizomatosa. *Culmi* robusti, trigoni, nodosi. *Folia* subbasalia et caulina, linearia, graminacea. *Inflorescentia* corymbum terminalem compositum formans, inflorescentiis lateralibus saepe adsunt, bracteis involucralibus foliaceis subtentia. *Spiculae* sessiles, in pedunculis fasciculatae, oblongo-lanceolatae, acutae, subcompresso-angulares, multiflorae. *Glumae* spiraliter imbricatae, anguste lanceolatae, mucronatae, carinatae, atrofuscae, marginibus ± laevibus ad basin decurrentibus. *Setae* perigonii 6, flexuae, antrorsus scabrae, ferrugineo-fuscae. *Stamina* 3; antherae lineares, crista connectivi obtusa atropurpurea, marginibus aculeatis. *Stylus* 2–3-fidus stigmatibus longipapillosis. *Nux* ellipsoidea, biconvexa vel trigona, minute striata, punctata, breviter apiculata.

Leaf Anatomy: outline V-shaped, bulliform cells well differentiated. Cuticular papillae present on the abaxial and adaxial epidermal surfaces. Air cavities absent between vascular bundles. Bundle sheath of vascular bundles having a fibrous inner layer with uniformly U-shaped cells. Silica bodies nodular, 1–2 bodies per cell.

Type of genus: **Sumatroscirpus junghuhnii** (Miq.) Oteng-Yeboah, **comb. nov.** Syn: *Scirpus junghuhnii* Miq., Fl. Ind. Bat. 3:307 (1855), Kükenthal in Bull. Jard. Bot. Buitenzorg, ser. 3, 16:301 (1940).

* Department of Botany, The University of Cape Coast, Ghana.

In its habit and general inflorescence, this genus shows affinity with *Scirpus* L. s.s. (type *S. sylvaticus* L.) from which it differs in having oblong-lanceolate, angular-subcompressed spikelets, narrowly lanceolate, decurrent crimson glumes, cuticular papillae on both surfaces of leaf, the inner bundle sheath uniformly U-shaped, and mesophyll of lobed spongy cells without air cavities forming the vascular bundles.

Sumatroscirpus is monotypic and endemic to Sumatra, Indonesia.

Amphiscirpus Oteng-Yeboah, **gen. nov.**

Herba perennis, rhizomatosa. *Culmi* caespitosi vel solitarii, teretes, in rhizomate ascendenti dispositi. *Folia* basalia subrosulata, canaliculata. *Inflorescentia* capitulum pseudo-laterale formans, bractea involucrali singulari erecta culmiformi subtenta. *Spiculae* cylindricae multiflorae. *Glumae* spiraliter imbricatae, ovatae, breviter mucronatae, marginibus ciliolatis. *Setae perigonii* aciculares, 1–3, molliter retrorsus scabrae. *Stamina* 3; antherae lineares, crista connectivi laevi. *Stylus* trifidus, stigmatibus papillosis. *Nux* obovoidea, planoconvexa, laevis, haud apiculata.

Anatomy. Culm: vascular bundles in a somewhat sinuous ring at the inner boundary of the chlorenchyma; ground tissue solid, occasionally breaking down at its outermost boundary between the vascular bundles; chlorenchyma not radiate, palisade-like; hypodermal sclerenchyma ± large triangular to rounded strands. Leaf: outline thickly crescentiform, with vascular bundles in a single arc series; adaxial hypodermis differentiated; bundle sheath: inner layer fibrous; silica bodies conical without satellites, 1 body per cell. Embryo structure: turbinate with sublateral coleoptile and root cap.

Type of genus: **Amphiscirpus nevadensis** (Watson) Oteng-Yeboah, **comb. nov.** Syn: *Scirpus nevadensis* Watson, Bot. King's Expl. 360 (1871).

On the basis of the inflorescence alone, this taxon was associated with *Schoenoplectus* (see Beetle in Amer. Journ. Bot. 31:264, 1944). The genus has been found not to belong to *Schoenoplectus* because of differences in a number of characters, including the solid ground tissue. The presence of ascending rhizomes and the structure of the embryo in *Amphiscirpus* recalls those of *Phylloscirpus* from which it differs in such features as inflorescence form, shape of fruit and its internal structures, and in the anatomy of the culm.

The internal structure of the culm in *Amphiscirpus* also recalls *Ficinia*, especially *F. scariosa*, from which it differs in having no disc-like gynophore at the base of the fruit.

Because of the indefinite relationship of *Amphiscirpus* to any one of the above-mentioned genera, it seems reasonable to treat it as a monotypic genus. It is restricted to the New World, where it has disjunct distributions in the western United States and Canada, and in Argentina.

Pseudoschoenus (C. B. Clarke) Oteng-Yeboah, **gen. nov.**

Syn: *Scirpus* L. sect. *Pseudo-schoenus* C. B. Clarke in Kew Bull. Add. ser. 8:113 (1908).

Perennial. *Culms* robust, terete. *Leaves* wanting or reduced to sheathing bases, the uppermost slightly inflated, obtusely triangular on one side.

Inflorescence a terminal panicle with flexuose peduncles, subtended by short, rigid, culm-like involucral bracts. *Spikelets* cylindrical, many-flowered, flowers often polygamo-dioecious. *Glumes* spirally imbricate, ovate, shortly mucronate, smooth. *Hypogynous bristles* needle-like, 6, retrorsely scabrous. *Stamens* 3, anthers linear (in ♀ flowers reduced, empty), crest of connective with prickly or papillose profile. *Style* 3–fid, papillose. *Fruit* oblanceolate, smooth, apiculate.

Anatomy. Culm: ground tissue net-like, containing numerous air cavities filled with diaphragmatic plates and vascular bundles. Chlorenchyma not radiate, palisade-like. Epidermal cells over hypodermal sclerenchyma taller and narrower than those over chlorenchyma. Peripheral vascular bundles often connected by narrow baculiform hypodermal sclerenchyma girders. Bundle sheath: inner layer fibrous, uniformly thick-walled. Silica bodies: conical without satellites, 2–3 bodies per cell. Embryo morphology: fungiform with basal coleoptile and lateral root cap.

Type of genus: *Scirpus spathaceus* Hochst. in Flora 759 (1845)=
Pseudoschoenus inanis (Thunb.) Oteng-Yeboah, **comb. nov.**
Syn: *Schoenus inanis* Thunb., Prodr. Fl. Cap. 16 (1794).
Scirpus inanis (Thunb.) Steud., Syn. Pl. Glum. 2:86 (1855).

It has been necessary to consider this taxon as a distinct genus because it has different characters from *Schoenus*, *Cladium* and *Schoenoplectus*. The spikelet, fruit and bristle characters are as in *Schoenus*, the paniculate inflorescence is as in *Cladium*, and the leafless and internal structure of the culm, the number of flowers per spikelet and the embryo morphology are as in *Schoenoplectus*.

The assumed relationship of *Pseudoschoenus* with *Desmoschoenus* in *Scirpus* s.l. (Koyama in Journ. Fac. Sci. Univ. Tokyo, Sect. 3, 7(6):290, 1958) has not been confirmed by detailed anatomical studies and in such circumstances, where a species does not fit into any allied genus, it appears justifiable to assign it to a genus of its own.

The earliest specific epithet under this genus is "*inanis*" given by Thunberg under *Schoenus*. The specific epithet "*spathaceus*" of Hochstetter is treated here as a synonym. *Pseudoschoenus* is a monotypic genus endemic to South Africa.

Blysmopsis Oteng-Yeboah, **gen. nov.**

A *Blysmo* Panzer ex Schultes foliis canaliculatis (haud carinatis) marginibus laevibus, spiculis atrofuscis 5–8 in inflorescentiam confertis, glumis majoribus 5 mm longis, setis perigonii antrorsus scabris, nuce majore 4 mm longa pallide fusca, et characteribus anatomicis differt.

Anatomy. Culm: ground tissue net-like, with numerous air cavities; vascular bundles regularly distributed in one ring between the chlorenchyma and ground tissue and irregularly in the ground tissue; hypodermal sclerenchyma of small rounded strands. Leaf: outline crescentiform, with vascular bundles arranged in an arc; adaxial hypodermis differentiated, no bulliform cells present; bundle sheath: inner layer fibrous, partially U-shaped at phloem pole, sometimes uniformly U-shaped especially around the smaller bundles; silica bodies conical with satellites tending to be nodular, 2–4

bodies per cell. Embryo structure: turbinate with lateral coleoptile and basal root cap.

Type of genus: **Blysmopsis rufa** (Hudson) Oteng-Yeboah, **comb. nov.** Syn: *Schoenus rufus* Hudson, Fl. Angl. ed. 2:15 (1778).

Comparing *Blysmus* (*B. compressus* (L.) Panz. ex Link) and *Blysmopsis*, I cannot help concluding that we are dealing with two basically distinct genera. The characters common to these two taxa are mainly those of the inflorescence, style and embryo structure. The anatomical differences between them are very well marked.