

## TAXONOMIC STUDIES IN CYPERACEAE-CYPEROIDEAE

A. A. OTENG-YEBOAH\*

ABSTRACT. New combinations of infra-generic categories are made in *Scirpus* s.s., *Eriophorum*, *Fuirena*, *Trichophorum*, *Erioscirus*, *Schoenoplectus*. A new sectional name is proposed in *Bolboschoenus*.

### INTRODUCTION

This paper deals with some of the taxonomic and nomenclatural changes necessitated by a recent morphological and anatomical study (Oteng-Yeboah 1972) of the subfamily Cyperoideae of the Cyperaceae. Many of the segregate taxa in this group previously regarded at infrageneric level were recognised as distinct genera and, although it is hoped to publish elsewhere the reasons for regarding them as independent genera, several new categories within them are formally dealt with here. The paper is divided into two sections dealing with: I, *Scirpus* allies; II, *Bolboschoenus*.

### I. SCIRPUS

*Scirpus* L., Sp. Pl. 47 (1753) et Gen. Pl. ed. 5:26 (1754) emend.

Key to sections

- 1 Bristles needle-like, erect, straight, often retrorsely scabrous;  
plant rhizomatous; stems generally solitary . . . . . sect. *Scirpus*
- + Bristles filiform to silky, tortuous, or finally greatly elongated,  
antrorsely scabrous, sometimes smooth; plant tufted . . . . . sect. *Lineatus*

#### Sect. *Scirpus*

Type species: *S. sylvaticus* L. (Ref.: Hitchcock in Nomencl. Prop. Brit. Bot. 110-199, 1930).

#### Sect. *Lineatus* (Beetle) Oteng-Yeboah, stat. nov.

Syn.: *Scirpus* L. sect *Androcoma* (Nees) Benth. & Hook. f. series *Lineatae* Beetle in Amer. Journ. Bot. 31:263 (1944).

Type Species: *Scirpus lineatus* Michx.

Apart from the sectional name *Trichophorum* (in the sense of American authors), which has habitually been referred to the *Scirpus* species with silky bristles, all others are synonymous with sect. *Scirpus* above. However, the name *Trichophorum* has been emended here from Persoon's original circumscription to refer in the restricted sense to species related to *Trichophorum alpinum* (L.) Pers.—a treatment which has been widely adopted in Europe.

In effect, this section of *Scirpus* species with silky bristles is without a name, and Beetle's series name *Lineatae*, which refers to the same group, has been adopted here with a slight change in spelling.

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

**Eriophorum** L., Sp. Pl. 52 (1753).

Key to subgenera and sections

- 1 Uppermost sheath greenish, with relatively long leaf-blade;  
glumes brown, often prickly/serrated at margins . . . . . subgen. *Eriophoropsis*
- + Uppermost sheath blackish at least above the middle, often  
bladeless or with a mucronate tip; glumes blackish, margins smooth . . . . . 2
- 2 Hypogynous bristles 6, filiform, tortuous, antrorsely scabrous,  
remaining concealed in the glumes . . . . . subgen. *Japonicus*
- + Hypogynous bristles more than 6, silky, smooth or antrorsely  
scabrous near tip, in fruit greatly elongated and overtopping  
the glumes . . . . . 3
- 3 General inflorescence a solitary terminal spikelet, subtended by a  
glumaceous involucre bract . . . . . subgen. *Eriophorum* sect. *Eriophorum*
- + General inflorescence a terminal umbel containing few to several  
stalked spikelets, subtended by elongated leaf-like involucre  
bracts . . . . . subgen. *Eriophorum* sect. *Phyllanthella*

Subgen. **Eriophorum**Sect. **Eriophorum**. Type: *E. vaginatum* L.Sect. **Phyllanthella** Anderss., Cyper. Scand. 13 (1849). Type: *E. angustifolium* Honck.Subgen. **Eriophoropsis** (Palla) Raymond in Svensk Bot. Tidskr. 48, 1:77 (1954). Type: *E. virginicum* L.Subgen. **Japonicus** (Koyama) Oteng-Yeboah, **comb. et stat. nov.**Syn.: *Scirpus* L. sect. *Japonici* Koyama in Journ. Fac. Sci. Univ. Tokyo,

Sect. 3 (Bot.) 7, 6:295 (1958).

Type species: *E. japonicum* Maxim.

The type species *E. japonicum* is somewhat intermediate between *Eriophorum* and *Scirpus*, though it shows more characters (particularly vegetative ones) of the former than the latter.

**Fuirena** Rottb., Descr. et Icon. Pl. 70, t. 19 (1773).

Key to subgenera and sections

- 1 Perianth segments (bristles) 6 all needle-like, or absent; culm  
trigonus, leaves V-shaped in T.S.; cuticular papillae present,  
overarching the stomata . . . . . 2
- + Perianth segments 6, inner petal-like plates of various shapes,  
outer 3 needle-like; culm terete or nearly so; leaves thinly  
crescentiform in T.S.; cuticular papillae absent . . . . . 3
- 2 Bristles present . . . . . subgen. *Pentasticha* sect. *Pseudoscirpus*
- + Bristles absent . . . . . subgen. *Pentasticha* sect. *Pseudo-isolepis*
- 3 Leaves with well developed blades; inflorescence generally  
paniculate . . . . . subgen. *Fuirena*
- + Leaf blades absent or greatly reduced to sheathing bases;  
inflorescence a single terminal cluster of few spikelets, sometimes  
solitary . . . . . subgen. *Vaginata*

Subgen. *Fuirena* Rottb., Descr. et Icon. Pl. 70, t. 19 (1773). Type species: *F. umbellata* Rottb.

Subgen. *Pentasticha* (Turcz.) Oteng-Yeboah, **comb. et stat. nov.**

Syn.: *Pentasticha* Turcz. in Bull. Soc. Nat. Moscow 2:330 (1862).

Sect. *Pseudoscirpus* (C. B. Clarke) Chermeson in Humbert, Fl. Madagascar 29<sup>e</sup> Famille 158 (1936).

Type species: *F. stricta* Steud.

Sect. *Pseudo-isolepis* (C. B. Clarke) Chermeson in Humbert, Fl. Madagascar 29<sup>e</sup> Famille 158 (1936).

Syn.: *Fuirena* series *Pseudo-isolepis* C. B. Clarke in Kew Bull., Add. ser. 8:115 (1908).

Type species: *F. pubescens* (Poir.) Kunth.

Subgen. *Vaginaria* (Pers.) Oteng-Yeboah, **stat. nov.**

Syn.: *Vaginaria* Pers., Synops. Pl. 1:70 (1805).

*Fuirena* sect. *Vaginaria* (Pers.) C. B. Clarke in Kew Bull., Add. ser. 8:115 (1908).

*Scirpus* sect. *Vaginaria* (Pers.) Koyama in Journ. Fac. Sci. Univ. Tokyo, sect. 3 (Botany), 7, 6:286 (1958).

Type species: *F. scirpoidea* Michx.

The recognition of the subgenera *Pentasticha* and *Vaginaria* is justified because the differences between them and *Fuirena* proper are quite spectacular. However, their previous status as distinct genera is not supported, since their overall similarities outnumber their dissimilarities from *Fuirena* sensu stricto.

### **Trichophorum Pers.**

Key to subgenera

- 1 Inflorescence terminal; spikelet solitary; glumes persistent  
subgen. *Trichophorum*
- + Inflorescence pseudo-terminal; spikelets (1 to) few, the lower  
stalked; glumes deciduous subgen. *Anthelophorum* (Ohwi) Oteng-Yeboah

Subgen. *Trichophorum*.

Type species: *T. alpinum* (L.) Pers.

Subgen. *Anthelophorum* (Ohwi) Oteng-Yeboah, **comb. et stat. nov.**

Syn.: *Scirpus* L. subgen. *Trichophorum* (Pers.) Ohwi sect. *Anthelophorum* Ohwi in Mem. Coll. Sci. Kyoto Imper. Univ. ser. B, 18:95 (1944).

*Scirpus* L. sect. *Baeothryon* (Ehrh. ex A. Dietr.) Benth. & Hook. f. series *Anthelophorum* (Ohwi) Koyama in Journ. Fac. Sci. Univ. Tokyo sect 3 (Botany), 7, 6:293 (1958).

Type species: *T. subcapitatum* (Thwaites) Ohwi.

The generic name *Trichophorum* was originally applied to three species by Persoon, two of which, *T. cyperinum* (*Scirpus cyperinus* (L.) Kunth) and *T. lineatum* (*S. lineatus* Michx.), are treated as belonging to *Scirpus*. The other species, *T. alpinum* (*Eriophorum alpinum* L., *Scirpus hudsonianus* (Michx.) Fern.), has been transferred between three different genera, as can be seen

from the synonymy cited. At present, the generic name *Trichophorum* is widely used in Europe for the species related to *T. alpinum*, while in America it is used for a section of *Scirpus* to accommodate the above 2 named *Scirpus* species. Since *Trichophorum* is accepted as a genus distinct from *Scirpus* s.s., it is reasonable to retain it for the *T. alpinum* group of species. The other available generic name *Baeothryon* Ehrh. ex Dietr. (1833) was ill-defined, including species some of which do not even belong to the family Cyperaceae.

The decision to recognise the 2 subgenera in *Trichophorum*, apart from their morphological discontinuities, was influenced by their geographical distributions. The subgenus *Trichophorum* has a sporadic range in the northern hemispheres of the Old and New Worlds with a disjunction of two Andean endemics in South America; the subgenus *Anthelophorum* is restricted to Indo-China, Indonesia and Malaysia.

**Erioscirpus** Palla in Bot. Zeitschr. 54:151 (1896).

Key to subgenera

- 1 Culm capillary or wiry, often prickly; spikelets few, crowded into a small head; vascular bundles in culm in a single ring; leaves thickly crescentiform in T.S. subgen. *Erioscirpus*
- + Culm robust, smooth; spikelets numerous, arranged loosely on a compound pseudo-umbel; vascular bundles in culm scattered; leaves thinly crescentiform to widely V-shaped in T.S. subgen. *Lachnophorum* (Nylander) Oteng-Yeboah

Subgen. **Erioscirpus**. Type species: *E. microstachyus* (Boeck.) Palla.

Subgen. **Lachnophorum** (Nylander) Oteng-Yeboah, **comb. et stat. nov.**

Syn.: *Eriophorum* L. sect. *Lachnophorum* Nylander in Acta Soc. Fenn. 3:22 (1846).

*Scirpus* L. sect. *Lachnophorum* series *Lachnophorum* (Nylander) Koyama in Journ. Fac. Sci. Univ. Tokyo, sect. 3 (Botany), 7, 6:294 (1958).

Type species: *E. comosus* (Wall.) Palla.

**Schoenoplectus** (Reichenb.) Palla in Engler, Bot. Jahrb. 10:298 (1889), nom. conserv.

Key to subgenera

- 1 Culms generally tufted; fruit small, up to 1.5 × 2.5 mm, rounded or mucronulate, often transversely wrinkled/rugose subgen. *Actaeogeton*
- + Culm solitary from horizontal rhizome; fruit large, up to 2 × 4 mm, beaked, smooth or minutely dotted 2
- 2 Glumes emarginate or notched at apex, broadly ovate, usually with gummy spots on back; anthers with prickly crests; leaves reduced or absent subgen. *Schoenoplectus*
- + Glumes not emarginate, often erose at apex, oblong-ovate or narrowly elliptic, smooth on back; anthers with smooth crests; leaves well developed subgen. *Malacogeton*

Subgen. *Schoenoplectus*.

Type species: *Schoenoplectus lacustris* (L.) Palla [Ref. Rickett & Stafleu in Taxon 8, 7:213-243 (1959)].

Subgen. *Actaeogeton* (Reichenb.) Oteng-Yeboah, **comb. et stat. nov.**

Syn.: *Scirpus* L. sect. *Actaeogeton* Reichenb., Fl. Germ. Excurs. 78 (1830).

*Scirpus* L. sect. *Eu-scirpus* series *Mucronatae* C. B. Clarke in Kew Bull. Add. ser. 8:112 (1908).

Type species: *S. mucronatus* (L.) Palla.

Subgen. *Malacogeton* (Ohwi) Oteng-Yeboah, **comb. et stat. nov.**

Syn.: *Scirpus* L. subgen. *Schoenoplectus* (Reichenb.) Ohwi sect. *Malacogeton* Ohwi in Mem. Coll. Sci. Kyoto Imper. Univ. ser. B, 18:97 (1944).

*Scirpus* L. sect. *Bolboschoenus* Aschers. series *Malacogeton* (Ohwi) Koyama in Journ. Fac. Sci. Univ. Tokyo sect. 3 (Botany), 7, 6:288 (1958).

Type species: *S. etuberculatus* (Steud.) Oteng-Yeboah, **comb. nov.**

Syn.: *Rhynchospora etuberculata* Steud., Syn. Pl. Glum. 2:142 (1855).

*Scirpus etuberculatus* (Steud.) O. Kuntze, Rev. Gen. 2:758 (1891).

The subgenus *Malacogeton* appears to be intermediate between *Schoenoplectus* proper and *Bolboschoenus*, since it shares a number of characters with both of them. However, in having a net-like ground tissue in addition to other characters, such as the pseudo-lateral inflorescence and long-beaked fruits, it is closer to *Schoenoplectus* than to *Bolboschoenus*. On account of its somewhat intermediate position, subgeneric rank appears to be the best solution. It is for the same reason that the subgenus *Actaeogeton* is proposed, especially because of its fruit characteristics (which are also found in unrelated genera such as *Rhynchospora*) and its tufted habit.

II. *BOLBOSCHOENUS*

*Bolboschoenus* is one of the segregate taxa often included in *Scirpus* L. s.l. (Koyama, 1958) but which has now been confirmed as constituting a distinct genus (Oteng-Yeboah, 1972). It contains about 16 species which are widely distributed in all regions of the world. The genus is quite uniform in its range of characters save for the shape and anatomy of the fruit. On the basis of these characters alone, the genus can be grouped into two distinct sections—Sect. *Bolboschoenus*, which contains the type of the genus, and Sect. *Lentischoenus*, described here as a new section.

*Bolboschoenus* (Aschers.) Palla sect. *Lentischoenus* Oteng-Yeboah, **sect. nov.**

A sect. *Bolboschoeno* stylis 2(–3) fidis, nucibus lenticularibus vel biconcavis cellulis exocarpii in sectione transversa radiatim elongatis differt.

Typus sectionis: *Bolboschoenus paludosus* (Nelson) Oteng-Yeboah, **comb. nov.**

Syn.: *Scirpus paludosus* A. Nelson in Bull. Torr. Club 26:5 (1899).

A North American species.

## Key to sections

- I Style 3-fid; fruit compressed trigonous to plano-convex; cells of exocarp isodiametrically shaped . . . . . sect. *Bolboschoenus*  
 + Style 2(-3)-fid; fruit lenticular to bi-concave; cells of exocarp radially elongated . . . . . sect. *Lentiscoenus*

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