The Morphology, Taxonomy and Distribution of the Podostemaceae in West Africa

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Abstract

The Podostemaceae in West Africa is described. A key to the genera is also included. The six genera, *Ledermanniella, Letestuella, Macropodiella, Saxicolella, Stonesia* and *Tristicha*, with 27 species are found in 12 countries in the sub-region. Sierra Leone, with 11 species, has the largest number of Podostemaceae in West Africa. About 63% of the species occur in Sierra Leone and Guinea alone. The highest number of species in any one genus occurs in *Ledermanniella* with 13 species. *Macropodiella, Saxicolella* and *Stonesia* have four species each. There are two monotypic genera, *Letestuella* and *Tristicha*. Seventeen of the species are endemic to the sub-region.

Introduction

The Podostemaceae, also known as river-weeds (Philbrick & Novelo, 1993), are the largest family of strictly aquatic flowering plants (Philbrick & Novelo, 1994; Rutishauser, 1995). Many members of the family resemble algae or bryophytes in habit (Willis, 1902ab; Jäger-Zürn, 2000). All species of the family are rheophytes (van Steenis, 1981; Rutishauser *et al.*, 1999). The plants grow firmly attached to their substrata of rock, boulders and sometimes wood or other firm objects by means of adhesive hairs, sometimes called root hairs or rhizoids, and/or finger- or disk-like holdfast organs, called haptera (Willis, 1915; Rutishauser, 1997) without penetrating them. Hence they are also haptophytes (Cook, 1996a, 1999).

Life of the plants

Vegetative growth occurs during the rainy season when the plants are usually completely submerged while emergent flowers and fruits are formed during the dry season of low water flow. The pollination mechanism in the family has not been studied extensively but has been reported to be entomophilous, anemophilous or hydrophilous (Sculthorpe, 1967; Hall, 1971). Anthesis usually occurs above water. Philbrick (1984) has, however, reported that anthesis occurs below, at and above the water surface at least in *Podostemum ceratophyllum* Michx. Fruit development and maturity is rapid (Went, 1929; Cook, 1996a). At maturity the fruits dehisce and the seeds are shed from the capsules, usually onto exposed rocks or other solid substratum, where they eventually germinate at the onset of the rains.

Many of the members of the river-weed family are annuals, e.g. *Marathrum rubrum* Novelo & Philbrick and *Vanroyenella plumosa* Novelo & Philbrick (Philbrick & Novelo, 1994). Some are perennials, e.g. *Podostemum ceratophyllum* (Philbrick, 1984) and *Oserya coulteriana* Tul. (Philbrick & Novelo, 1994), while others can be both annuals and perennials, e.g. *Tristicha trifaria* (Bory ex Willd.) Spreng. (Philbrick & Novelo, 1997) and *Mourera fluviatilis* Aublet (Rutishauser & Grubert, 1999). Such species grow as annuals if the