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Contents

Potamogetonaceae). Described similarities between *Acorus* and *Triglochin* were challenged by two hypotheses: 1) What was described as a "flower" in *Triglochin* is a pseudanthium (an inflorescence looking like a flower), and the "perianth" consists of bracts; 2) *Triglochin* does not have an abaxial outermost "tepal" reminiscent to a flower-subtending bract, but flower development commences with two lateral (or adaxial) tepals. We illustrate the flower development of *Triglochin maritimum* in the framework of other Juncaginaceae (*Triglochin, Maundia, Tetrontium*). The developmental genetics of the perianth in basal monocots is discussed with respect to "organ identity" and "homology". Up to now, the two challenging hypotheses are not supported by our data. *Triglochin* has no pseudanthium, and the perianth consists of tepals. Flower development is unidirectional with a leading abaxial tepal. However, there are putative reductions in the flowers within a single inflorescence, within the genus *Triglochin*, as well as the entire family Juncaginaceae.

PHYLOGENETICS OF ARACEAE AND LEMNACEAE: EVIDENCE FROM MULTIPLE PLASTID DNA DATA SETS

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Historically, Lemnaceae have been assumed to be closely related either to *Pistia* (Araceae) or to the alismatids. However, a cladistic analysis of restriction sites in plastid DNA by French (1995) placed *Lemna* as sister to the monoecious subfamily Aroideae (Araceae), whereas the DNA sequence data from plastid *trn*L-F of Barabé *et al.* (2002) of 33 genera placed it as sister to the "true Araceae" of Mayo *et al.* (1997). We assessed the monophyly and relationships of Araceae and Lemnaceae using cladistic analysis of sequence data from the plastid *rbc*L and *mat*K genes and the *trn*L-F region for 92 taxa, representing 87 genera of Araceae and five of Lemnaceae. Representatives of Acoraceae, Alismataceae, Juncaginaceae, Magnoliaceae, Piperaceae, and Tofieldiaceae were used as outgroups. Our results indicate that Lemnaceae are nested within Araceae sister to the "true Araceae," as in Barabé et al. The branching order of the major clades within Araceae identified by our analysis is: 1) "protoaraceae," including Gymnostachydoideae sister to monophyletic Orontioideae; 2) Lemnoideae; 3) a group combining monophyletic Monsteroideae and Pothoideae; 4) Lasioideae; and 5) a moderately supported subfamily Aroideae (*sensu* Mayo et al. 1997) with Calloideae (*Calla*) embedded within them. The "spine" of the Aroideae/Calloideae clade is only weakly supported, but the there are two strongly supported subclades of particular interest; one is the basal branch, composed of perigoniate African genera (*Zamioculcas*, *Gonatopus*, and *Stylochaeton*), and the other is derived and corresponds to the more narrowly defined concept of subfamily Aroideae recently proposed by Keating (2002).

BRAZILIAN *ALSTROEMERIA* L. (ALSTROEMERIACEAE): SYNOPSIS

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Alstroemeriaceae is a neotropical family occurring from Mexico to Southern South America with about 180 species (Assis 2001). The family comprises three genera: *Alstroemeria* L. (including *Schickedantzia* Pax and *Taltalia* E.Bayer), *Bomarea* Mirb. and *Leontochir* Phil. (Sanso & Xifreda 2001). In Brazil, there are two genera: *Alstroemeria* and *Bomarea*. *Alstroemeria*, the Incas lily, is a South American genus represented by around 100 species ranging from Venezuela (3° North) to Tierra del Fuego, Argentina (53° South). In Brazil, the genus comprises 38 species distributed in the eastern portion of the country. These species occur in different habitats and elevations: forest, savanna, high fields, marsh, "campos rupestres" and "caatinga", from 300 m high in the Amazon up to 2,300 m high at Serra do Itatiaia. The genus is characterized mainly for erect herbaceous plants, resupinate leaves, terminal umbeliform inflorescences, and zygomorphic flowers with patterned tepals. This work presents a synopsis for the revision of the genus in Brazil. As a result of this study, 38 species are recognized. Ten of these are new species: *A. amabilis* M.C. Assis, *A. capixaba* M.C. Assis, *A. paraensis* M.C. Assis, *A. Julieae* M.C. Assis, *A. tombolatoi* M.C. Assis, *A. ochracea* M.C. Assis, *A. penduliflora* M.C. Assis, *A. rupestris* M.C. Assis, *A. stenophylla* M.C. Assis and *A. variegata* M.C. Assis. Keys for the identification of genera and species are presented, as well as brief descriptions, illustrations, distribution and comments about the various taxa.