



## Article

### Characterization of *Hubera* (Annonaceae), a new genus segregated from *Polyalthia* and allied to *Miliusa*

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#### Abstract

On the basis of molecular phylogenetics, pollen morphology and macromorphology, a new genus of the tribe Miliuseae, *Hubera*, segregated from *Polyalthia* and allied to *Miliusa*, is established and described. It is characterized by the combination of reticulate tertiary venation of the leaves, axillary inflorescences, a single ovule per ovary and therefore single-seeded monocarps, seeds with a flat to slightly raised raphe, spiniform(-flattened peg) ruminations of the endosperm, and pollen with a finely and densely granular infratectum. Twenty-seven species are accordingly transferred to this new genus.

**Key words:** Malmeoideae, molecular systematics, Old World floristics, Paleotropics, palynology

#### Introduction

The large magnoliid angiosperm family Annonaceae is prominent in lowland forests across the tropics (Gentry 1988, Slik *et al.* 2003). Circumscription of genera within the family was initially founded on characters emphasizing the diversity of floral morphologies represented in the family, which recapitulates many trends found with angiosperm evolution at large (Johnson & Murray 1995, Endress & Doyle 2009, Endress 2011): apocarpy/syncarpy, polypetaly/sympetaly, bisexual/unisexual flowers, reductions in stamen and carpel number, and changes in ovule number.

At the same time that molecular and other analyses have shown the homoplasious evolution of similar perianth specializations (e.g. Mols *et al.* 2004b, Saunders 2010), it is nevertheless true that such specializations still have value as morphological markers of particular clades within the family, usually at the generic level. However, reliance on perianth modifications for classification in Annonaceae has also resulted in genera defined by lack of such specializations, i.e. they are defined on the basis of symplesiomorphic perianth features (Johnson & Murray 1999). This situation is best exemplified in the family by the Paleotropical genus *Polyalthia* Blume (1830: 68), which has been defined by similarity of petals in its two perianth whorls and little else; it is thus not surprising that several analyses (e.g. Mols *et al.* 2004a, b, Richardson *et al.* 2004, Xue *et al.* 2011) have shown the genus to be polyphyletic. Even before the advent of molecular analyses, species had been removed from the genus on morphological grounds. For example, the new genus *Greenwayodendron* Verdcourt (1969: 89) was established to accommodate two African species now known to be closer to a suite of African genera (Couvreur *et al.* 2009), Johnson (1989) removed two species to the genus *Disepalum* Hooker (1860: 156), following the pollen morphology studied by Walker (1971) and *Maasia* Mols, Keßler & Rogstad in Mols *et al.* (2008: 493) was recognized following Rogstad's (1989) systematic studies, although monophyly of the last genus had been demonstrated in phylogenetic