

Resurrection and New Species of the Neotropical Genus *Adelonema* (Araceae: Philodendron Clade)

Wong Sin Yeng,^{1,4} Alan W. Meerow,² and Thomas B. Croat³

¹Department of Plant Science and Environmental Ecology, Faculty of Resource Science and Technology,
Universiti Malaysia Sarawak, 94300 Samarahan, Sarawak, Malaysia.

²National Germplasm Repository, United States Department of Agriculture/Agricultural Research Service
(USDA-ARS), 13601 Old Cutler Road, Miami, FL, 33158-0000, U. S. A.

³Missouri Botanical Garden, Monsanto Research Building, Post Office Box 299, St. Louis, Missouri 63166, U. S. A.

⁴Author for correspondence (sywong@unimas.my)

Communicating Editor: Leslie Goertzen

Abstract—Previous studies have shown *Homalomena* as traditionally defined to be polyphyletic, with Neotropical species phylogenetically distinct from Asian species. This study of 29 accessions of 10 Neotropical taxa, and a total of 135 accessions representing 92 taxa of *Homalomena*, *Furtadoa*, and *Philodendron* for nuclear ITS and plastid *matK* regions, supports resurrection of the genus *Adelonema* for Neotropical species currently assigned to *Homalomena*. *Adelonema* is here delimited as a Neotropical genus of 16 species divided into two new sections: sect. *Adelonema* and sect. *Curmeria*, based on morphologically supported molecular results. The genus *Adelonema* is distinguished by a hypogeal rhizome, crushed vegetative tissues smelling of anise, an extensively sheathing, sometimes prickly petiole, chartaceous often variegated leaf blades, a spadix either obliquely inserted on the spathe/peduncle (sect. *Adelonema*), or stipitate (sect. *Curmeria*), ovaries with 2–4-pluriovulate locules, and anatropous ovules on an axile placenta. Four new species are described: *Adelonema orientalis*, *A. palidineria*, *A. panamensis*, and *A. yanamonoensis*. Eleven new combinations are made: *Adelonema allenii*, *A. crinipes*, *A. hammelii*, *A. kvistii*, *A. moffleriana*, *A. peltata*, *A. picturata*, *A. roezlii*, *A. speariae*, *A. wallisii*, and *A. wendlandii*.

Keywords—*Curmeria*, *Homalomena*, ITS, *matK*, new combinations, taxonomy.

Cusimano et al. (2011) resolved *Philodendron* Schott, *Homalomena* Schott, and *Furtadoa* M. Hotta in a clade (the Philodendron clade) equivalent to the combined tribes Homalomeneae and Philodendreae sensu Mayo et al. (1997) and Cabrera et al. (2008), and sister to African tribe Culcasieae. Together these, termed the Homalomena clade (Cusimano et al. 2011, Fig. 2, clade 27), are supported by synapomorphic anatomical character states observed by French (1985, 1987a, b): occurrence of sclerified hypodermis (or known as exodermis tissues in Tenorio et al. 2014) and resin canals in the roots, and absence of endothelial thickenings in the anthers (except in *Homalomena* itself). The Culcasieae clade (11) is supported synapomorphically by a hemiepiphytic climbing habit, and the Philodendron clade (12) by female-sterile-male spadix floral zonation. Plants of *Homalomena* are aromatic (terpenoids), diminutive to robust terrestrial or rheophytic herbs with mainly epigeal stems and almost entirely pleionanthic modules. In most species an obscure pulvinus is present ca. two thirds along the petiole, although a few species have a pronounced pulvinus at the petiole-leaf blade junction. Inflorescences are produced in a simple or gorgonoid synflorescence (most *Homalomena*; see Ray 1987, 1988), or are solitary (*Furtadoa*, some *Homalomena*). Flowers are unisexual with the pistillate flowers below and staminate above on the spadix, with the pistils usually with an associated staminode (most *Homalomena*, *Furtadoa*), and staminate flowers with an associated pistillode (*Furtadoa*). Staminate flowers in *Homalomena* are almost all comprised of 2–6 anthers with a single exception, Sumatran *H. monandra* M. Hotta, with unistaminate flowers. *Furtadoa* has unistaminate flowers. Where observed, placentation is parietal (Asian *Homalomena*), axial (Neotropical *Homalomena*), or basal (*Furtadoa*). In all species of *Homalomena* and *Furtadoa* the entire spathe is persistent throughout fruiting, splitting at the junction of the peduncle at fruit maturity to expose the fruits (where known, ripe fruits are sweetly fragrant). Seeds, where inves-

tigated, are small (> 1.5 mm long) with a longitudinally ribbed testa, and lack micropylar elaboration (Seubert 1993).

Homalomena as currently circumscribed (Mayo et al. 1997) is distributed in the Neotropics and Asian tropics. However, Gauthier et al. (2008) and Wong et al. (2013) showed the Neotropical species of *Homalomena* to form a separate clade to the Asian species. The type of *Homalomena* is *H. cordata* Schott, from Java (Asia). *Homalomena* sensu stricto (i.e. excluding the Neotropical species) comprises four sections: *Homalomena* ('*Euhomalomena*' of Engl. & K. Krause); *Cyrtocladon* (Griff.) Furtado; *Chamaecladon* (Miq.) Engl. & K. Krause, and *Geniculatae* M. Hotta. Two pre-existing generic names are available for Neotropical species of *Homalomena*: *Adelonema* Schott (1860) and *Curmeria* Linden & André (1874). The type of *Adelonema* is *A. erythropus* Schott (currently *Homalomena erythropus* (Schott) Engl.). *Curmeria*, typified on *C. picturata* Linden & André, is presently called *Homalomena picturata* (Linden & André) Regel. Engler and Krause (1912), because of the then incompletely known inflorescences, treated *Adelonema*, with a single species, *A. erythropus*, as of uncertain affinity, stating that it probably belonged to *Homalomena* sect. *Curmeria*, in which they placed all other South American species treated: *Homalomena roezlii* (Mast.) Regel, *H. wallisii* Regel, *H. crinipes* Engl., *H. wendlandii* Schott, *H. picturata* (Linden & André) Regel, and *H. peltata* Mast. Section *Curmeria* has been uncritically employed for all the Neotropical species in all subsequent treatments (Furtado 1939; Hotta 1967; Mayo et al. 1997).

Gauthier et al. (2008) and Wong et al. (2013) focused on *Philodendron* and Asian *Homalomena*, respectively (using nuclear ITS region only), and included only five (Gauthier et al. 2008) and six (Wong et al. 2013) representatives of 12 known species of Neotropical *Homalomena* (hereinafter termed *Adelonema*). The aim of the current study was to sample an expanded representation of *Adelonema* for nuclear ITS and plastid *matK* regions. To this end, 29 accessions of 10 *Adelonema* taxa were included to test