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Oreocharis × *heterandra* (Gesneriaceae): a natural hybrid from the Shengtangshan Mountains, Guangxi, China

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Abstract

Macro- and micro-morphological characters, molecular nuclear ribosomal internal transcribed spacer and chloroplast *trn*L-F intron-spacer data confirmed the hybrid status of *Oreocharis* × *heterandra*. Cytological studies showed that the parental species and the hybrid possess *2n*=34 chromosomes, suggesting that chromosome translocations, not dysploid or ploidy level changes, are the cause of the high hybrid sterility. Recurrent reciprocal hybridisation between its parental species *O. argyreia* and *O. magnidens* in an area of secondary contact is apparently responsible for the persistent presence of the hybrids, though at low levels. As a consequence the name *Oreocharis heterandra* has to be changed to *Oreocharis* × *heterandra*.

Key words: Cytology, hybrid sterility, ITS, molecular data, morphology, *Oreocharis argyreia*, *Oreocharis magnidens*, recurrent hybridisation, *trn*L-F

Introduction

The significance of interspecific hybridization for plant evolution has long been recognised (Stebbins 1950, 1959, Lewis 1966, Grant 1981). Hybridization can lead to the establishment of new species through polyploid or homoploid speciation and introgression (Arnold 1997, 2006, Abbott 1992, Rieseberg & Carney 1998, Buerkle *et al*. 2000, Rieseberg *et al.* 2003). Interspecific crosses do not occur uniformly across angiosperms but are more frequent in certain families (Ellstrand *et al.* 1996). They do not necessarily need to result in the establishment of a new species or hybrid swarm if polyploidization is not involved (e.g. Rieseberg *et al.* 2003, Mallet 2007, Rieseberg & Willis 2007, Soltis & Soltis 2009), and the first generation plants are completely or almost fully sterile (e.g. Saito *et al.* 2006, 2007).

Gesneriaceae is one of the families where hybridization is common (Ellstrand *et al.* 1996): genera in which natural hybrids have been found are the New World *Columnea* Linnaeus (1753: 638; Morley 1976) and *Sinningia* Nees von Esenbeck (1825: 297; Clayberg 1996) and the Old World *Monophyllaea* Brown (1838: 121; Okada 1990) and *Cyrtandra* Forster & Forster (1776: t. 3; Ellstrand *et al*. 1996, Smith *et al*. 1996, Schlag-Edler & Kiehn 2001, Kiehn 2005). Particularly in the African genus *Streptocarpus* Lindley (1828: pl. 1173), hybrid origin for some species has been suspected (Hilliard & Burtt 1971) and then demonstrated to play a significant role in the evolution of the genus (Möller *et al.* 2004, Hughes *et al*. 2005, de Villiers 2008). While hybridisation is widespread in some Gesneriaceae genera, examples from China are rare; none are listed in the Flora of China (Wang *et al.* 1998).

During fieldwork in China in 2006, specimens of three species of *Oreocharis* Bentham (1876: 995, 1021) were collected in Jinxiu, Shengtangshan, in the Dayao Shan Mountains in Central Guangxi (Fig. 1). In

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