

# *Metagentiana*, a new genus of Gentianaceae<sup>1</sup>

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**Abstract.** The evidence from gross morphology, floral anatomy, chromosomes, palynology, and embryology all indicates that sect. *Stenogyne* is discordant within the genus *Gentiana* and is as distinct from the other sections of *Gentiana* as are other genera, such as *Tripterosperrum* and *Crawfurdia*. In light of these characters, sect. *Stenogyne* is removed from *Gentiana* and given generic rank as the new genus *Metagentiana*. It is more related to *Tripterosperrum* and *Crawfurdia* than to *Gentiana*, though it is more primitive than the first two genera. Together with *Tripterosperrum* and *Crawfurdia* the new genus forms a monophyletic group, which is the sister group to the genus *Gentiana*. Fourteen new combinations required at specific rank are proposed.

**Keywords:** *Gentiana*; *Gentianaceae*; *Metagentiana*; New Genus; Taxonomy.

## Introduction

*Gentiana* sect. *Stenogyne* was established by Franchet (1884) and was revised by Kusnezov (1894). It contains fourteen species: Ten of these are highly restricted to southwestern China; two are relatively widespread in northwestern and central China; one extends to eastern Burma from southwestern China, and one is endemic to Thailand. *Stenogyne* is the most disputable and poorly known of *Gentiana*'s 16 sections. Smith (1965) considered it a somewhat mysterious group in *Gentiana* from its morphological characters, which suggested a closer affinity with *Tripterosperrum* or *Crawfurdia* than with other sections of *Gentiana*. Löve and Löve (1976) recommended the transfer of this section to the genus *Tripterosperrum*, tentatively as a subgenus (*Tripterosperrum* subgen. *Stenogyne*). However, they had no karyological information to make a further delimitation. Yuan and Küpfer (1993) reported chromosome numbers for six species of this section for the first time and suggested a specialized and isolated position of this section in the genus *Gentiana* because of its higher and obviously secondary basic chromosome numbers  $x=17, 21$ , and 23. Three years later (Yuan et al., 1996), based on the nucleotide sequence of the internal transcribed spacer (ITS) of nuclear Ribosomal DNA, they further suggested excluding sect. *Stenogyne* from *Gentiana* and classifying it as a distinct genus. However, the necessary taxonomic changes were never made. Halda (1995) made sect. *Stenogyne* a subgenus, still positioned in the genus *Gentiana*. Since 1990, we have examined gross

morphology, floral anatomy, karyology, pollen morphology and embryology for most genera in the subtribe *Gentianinae* and have published a series of papers (Chen et al., 1997, 1998, 1999a, 1999b, 2000; Ho and Liu, 1990, 1999; Ho and Pringle, 1995; Ho et al., 1994, 1996, 1997, 1999, 2000; Liu and Ho, 1996a, 1996b, 1997; Xue et al., 1999a, 1999b). The present paper attempts to bring together these interactive studies of various materials relating to *Gentiana* sect. *Stenogyne* with the hope of better understanding its classification and systematic position.

## Character Analyses

Based on detailed comparisons of characters such as gross morphology, floral anatomy, chromosomes, pollen morphology, and embryology, this study presents a complete documentation of *Gentiana* sect. *Stenogyne*. The concise descriptions of these characters used for the present study are as follows.

## Gross Morphology

Most species in *Gentiana* sect. *Stenogyne* are annual herbs, but a few are perennials with extremely short rhizomes. The stem is erect and branched. Leaves are sessile, broadly ovate to ovate-triangular. Flowers are many, with each solitary and sessile at the end of stems and branches, subtended by a pair of leaf-like bracts. The calyx is tubular; midveins of the lobes are keeled and winged into the calyx-tube. The corolla is funnelform, and its plicae is long and wide. The margin of the plicae may be erose, denticulate, or fimbriate. The stamens are unequal and more or less curved downwards unilaterally. There are 5 nectaries at the base of the ovary. The style is filiform and about as long as the ovary. The capsules are cylindrical. The seeds are triquetrous with the three edges winged or rarely unwinged. Sect. *Stenogyne* is very

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