

# Genus *Metagentiana* T. N. Ho & S. W. Liu (Gentianaceae Juss.) – a new record for flora of Vietnam

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**Abstract.** Ho et al. proposed to exclude *Stenogyne* section from the genus *Gentiana* and classifying it as a distinct genus (*Metagentiana*). Fourteen species of this genus have been recorded and distributed in China, Myanmar and Thailand. This is the first time there has been a confirmed genus *Metagentiana* distributed in Vietnam. This genus has two species: *Metagentiana rhodantha* and *Metagentiana primuliflora*, which are proposed in Vietnam. Particularly, *Metagentiana rhodantha*, which had only been known from China, was reported in Vietnam. A detailed description along with their distribution, habitat, ecology, illustrations, and photos has been provided to aid species identification. The key to identify all taxa of the genus has been constructed

## 1 Introduction

*Stenogyne* is one of *Gentiana*'s 16 sections, belonging to the gentian family (Gentianaceae Juss.) [1]. It was established by Franchet [2] and was revised by Kusnezov [3]. It is the most disputable and poorly known of *Gentiana*'s 16 sections.

Genus *Metagentiana* was established by Ho et al [4] on the basis of removing the *Stenogyne* section from the genus *Gentiana* based on data on gross morphology, floral anatomy, chromosome number, palynology, embryology, and molecular data. Before Ho Ting Nong, many botanists considered it as a section of the *Gentiana* genus [5-7]. However, contrary to the point of view of many authors at that time, Smith [8] and Löve [9] based on observations of gross morphology, realized the difference between the *Stenogyne* section and the sections another in the genus *Gentiana* and its close relationship with the genera *Tripterosperrum* and *Crawfordia*. Löve and Löve (1976) proposed to transfer this section to the genus *Tripterosperrum*, which is intended to be a new subgenus of this genus [10] also noticed this difference, but in his classification, the author classified this section as a subgenus of the genus *Gentiana*. Subsequent authors' karyological studies continued to support evidence that this section differs from the other sections in the genus *Gentiana* [11-14]. Authors [12-13] in their initial studies, published chromosome numbers for six species belong to this section; at the same time, based on their differences in the number of haploid chromosomes. They suggested to separate the location of this section within the genus *Gentiana*. Their subsequent research results on ITS sequencing of the DNA ribosome continued to confirm the difference of the *Stenogyne* section compared to other sections in the *Gentiana* genus [14]. Thereafter, species of this section continue to be studied by many authors in a relatively comprehensive way [15-26]. Based on the

summary of research data of previous authors and based on their own research, suggested removing *Stenogyne* section from the genus *Gentiana* and classifying it as a distinct genus (*Metagentiana*) [4]. They affirmed that this new genus was more related to *Tripterosperrum* and *Crawfordia* than to *Gentiana*, though it was more primitive than the first two genera; together with *Tripterosperrum* and *Crawfordia* the new genus formed a monophyletic group, which was the sister group to the genus *Gentiana* [4]. Fourteen species (China – thirteen species; Myanmar – one species and Thailand – one endemic species) of the genus *Metagentiana* have been proposed. The species of this genus are mainly distributed in high mountains, grassland, and coniferous forests.

In Vietnam, Loureiro [27] was the first botanist to study on *Gentiana* genus; two species of this genus have been recorded by the author to be distributed in Vietnam. The "Flore du Cambodge, du Laos et du Vietnam" [28] is considered the most complete classification work of this genus in Vietnam; nine species of the genus distributed in Vietnam were authored detailed description, including *Gentiana primuliflora* species (belonging to *Stenogyne* section) which was first recognized by the author to be distributed in Vietnam, it was previously endemic to China.

During the course of revisionary on the Gentianaceae in Vietnam, interest arose in the specimens, which were housed in the herbarium of Institute of Ecology and Biological Resource, Hanoi (HN). After thorough morphological study with the help of the relevant literature [1,4, 27-30], it was identified as *Metagentiana rhodantha* (Franch.) T. N. Ho & S. W. Liu, a new distributional record for Vietnam. This taxon was so far known only from China [4] and had never been recorded in Vietnam.

Earlier, Hul Sovanmoly [28] recorded species *Gentiana primuliflora* Franch. in Vietnam, distributed in

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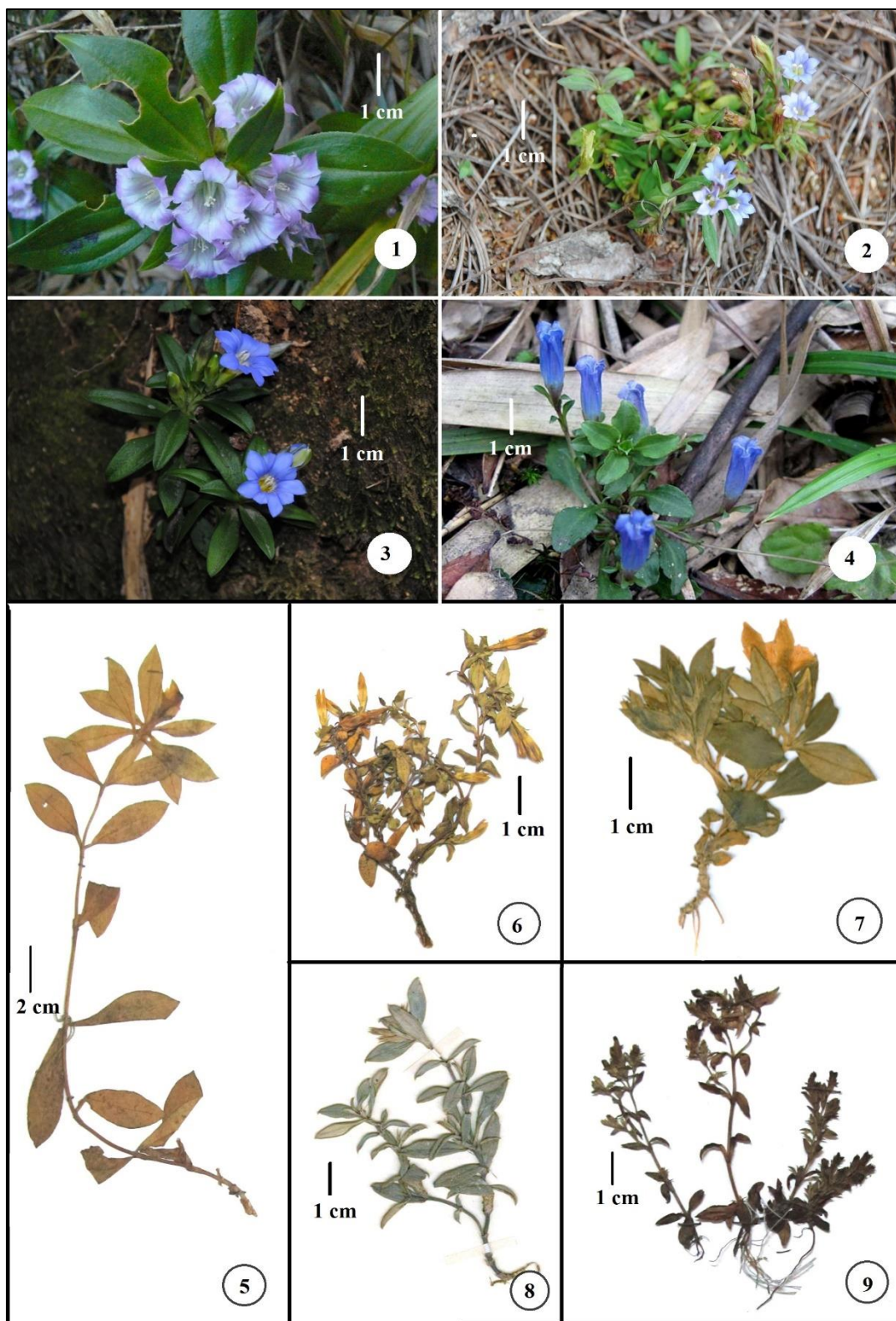


Fig.1 *Gentiana* species are distributed in Vietnam: 1. *G. cephalantha* Franch. (Fan Si Pan at an altitude of 2400 m, Lao Cai province, photo by Khuat Van Quyet, 2012); 2. *G. loureiroi* (G. Don) Griseb. (Lam Dong province, photo by Tran The Bach, 2012); 3. *G. greenwayae* Merr. (Lam Dong province, photo by Tran The Bach, 2012); 4. *G. lowryi* Hul (Fan Si Pan at an altitude of 2500 m, Lao Cai province, photo by Khuat Van Quyet, 2012); 5. *G. rigescens* Franch. (photo by Khuat Van Quyet, 2013, based on specimens Le Kim Bien 7808 (HN)); 6. *G. langbianensis* A. Chev. ex Hul (photo by Khuat Van Quyet, 2013, based on specimens Pételot 5735 (HNU)); 7. *G. tonkinensis* Hul (photo by Khuat Van Quyet, 2013, based on specimens Poilane 3561 (HNU)); 8. *G. jouyana* Hul (photo by Khuat Van Quyet, 2013, based on specimens CBL 1382 (HN)).

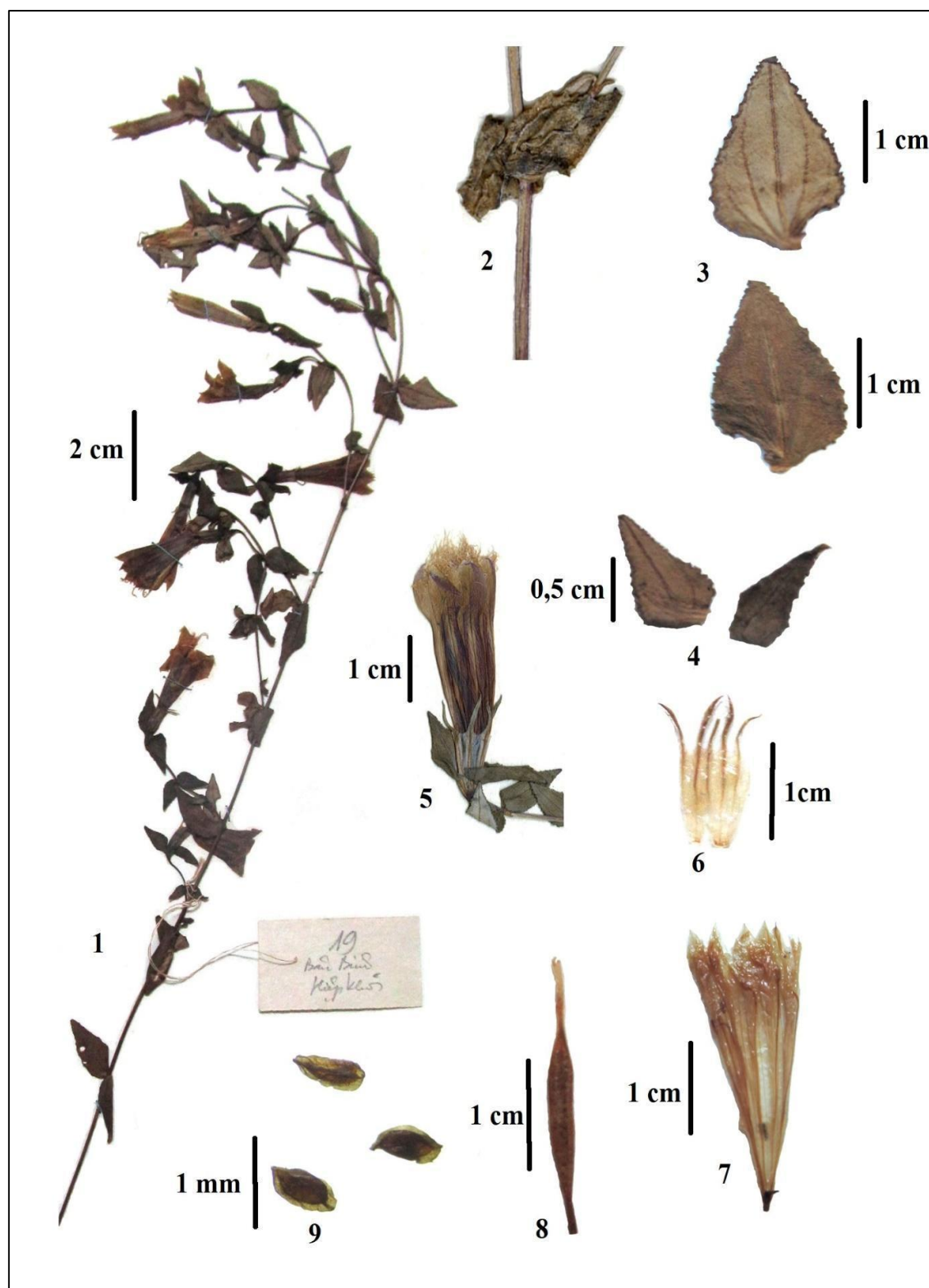


Fig.2 *Metagentiana rhodantha* (Franch.) T.N. Ho & S.W. Liu; - 1. Flowering branch; 2. Showing angled on the stem; 3. Leaf; 4. Bracts foliaceous; 5. Flower; 6. Opened calyx abaxial view; 7. Opened corolla showing stamens; 8. Fruit; 9. Seeds broadly winged (photo by Khuat Van Quyet, 2013, based on specimens Ban-Bien-Hiep-Khoi 19 (HN)).

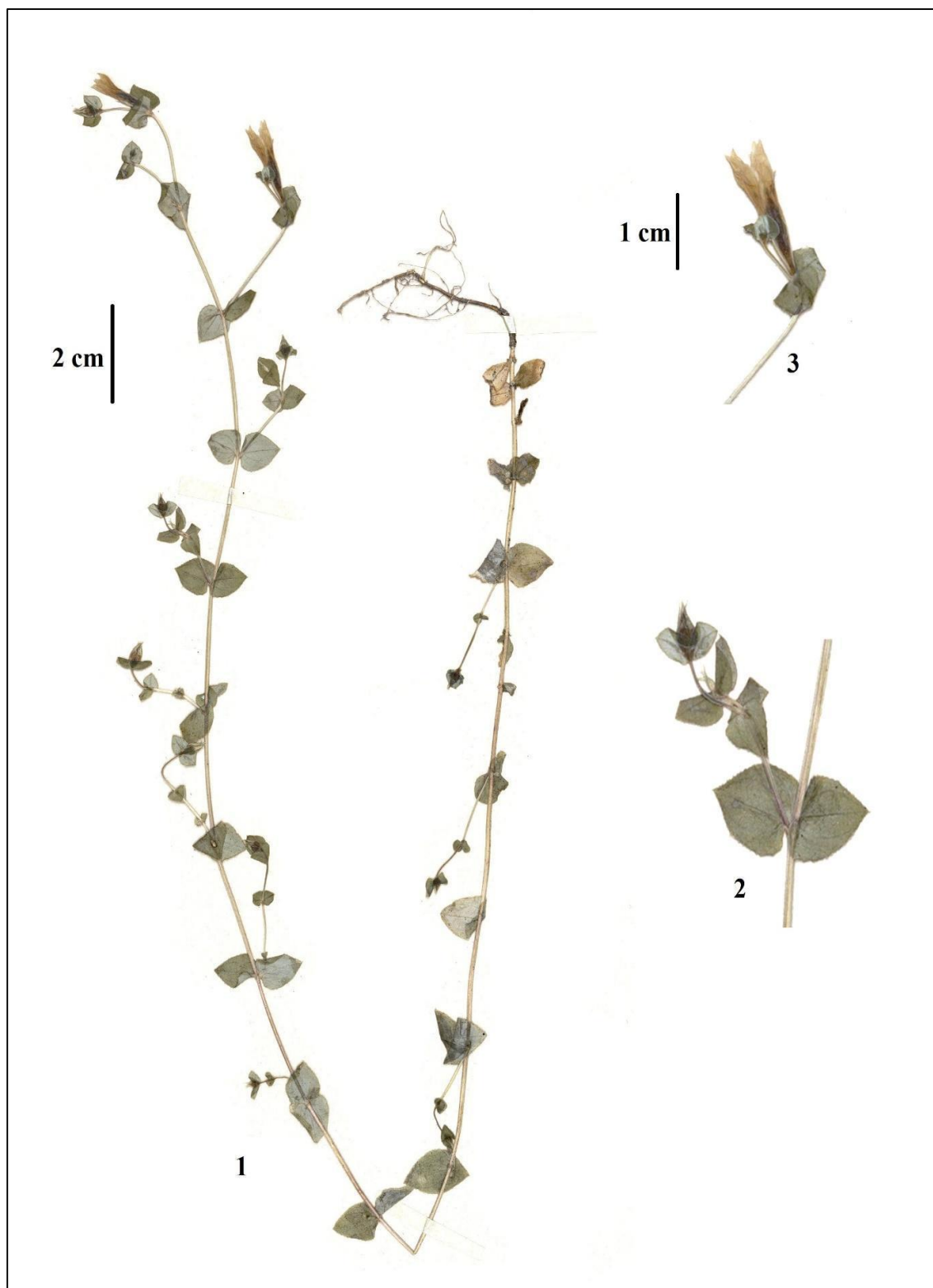


Fig.3 *Metagentiana primuliflora* (Franch.) T.N. Ho & S.W. Liu; - 1. Flowering plant; 2. A pair of leaves and flowering branch; 3. Flower (photo by Khuat Van Quyet, 2013, based on specimens Evrard 1468 (HNU))