



First record of the critically endangered *Hydrangea steyermarkii* Standl. (Hydrangeaceae) in Mexico, and description of a new widespread *Hydrangea* species of Mesoamerica

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Abstract

Based on our detailed observations in the field, completed with herbarium material of representatives of *Hydrangea* section *Cornidia* in southeastern Mexico and Central America, we found that *Hydrangea steyermarkii* Standley, in contrast to what has been assumed up to now, is restricted to the Tacaná Volcano on the border of Mexico and Guatemala. The majority of the specimens with reddish or whitish indument on their branches in South East Mexico and Central America, belonging to this nearly exclusively Neotropical *Hydrangea* clade, had been identified as such, but the characters of these collections do not coincide with the single type specimen of *H. steyermarkii*, neither with other individuals of this species growing in the type locality area. In fact, nearly all specimens of Mesoamerica that had been identified as this species belong to a new species with a relatively wide distribution, which we describe here. This new species is illustrated and compared with *H. steyermarkii*, of which we also provide an amended description and illustrations. Finally, on the basis of these two species we document previously suggested dioecism in this plant group, which not only has consequences for systematics and nomenclature in this clade, but also for conservation.

Key words: Hortensia, taxonomy, Neotropics, functional dioecism, conservation

Introduction

The genus *Hydrangea* Linnaeus (1753a: 397) (Hydrangeaceae) is with more than 1,000 cultivars and hybrids already since centuries a very popular ornamental plant group. These ornamentals with inflorescences with attractive marginal flowers are commonly known as hortensias, and descend from Asian shrubby species such as *H. macrophylla* (Thunb.) Ser. in de Candolle (1830: 15) and *H. aspera* D. Don (1825: 211). The Asian representatives of *Hydrangea* have been relatively well studied although the species boundaries and relationships continue to be disputed (Wei & Bartholomew 2001). Contrarily, the nearly exclusively American section *Cornidia* Ruiz & Pavón (1794: 53) is very poorly known from any point of view, be it taxonomical, biological or ecological, mainly because the available taxonomical and floristic studies are entirely based on the observation of fragmentary herbarium material. All representatives are evergreen root climbers growing up to 30–40 meter high in the canopy of mostly primary forests, with coriaceous leaves and hortensia-like whitish, greenish, yellowish or purplish inflorescences, with or without marginal so-called “sterile” flowers. Their distribution area extends from northern Mexico to southern Chile and Argentina with one species, *Hydrangea integrifolia* Hayata in Matsumura & Hayata (1906: 131), in China, Taiwan and the Philippines.

variation in *Hydrangea* s.s. and it seems that the two taxa mentioned above belong to a group with many different morphospecies distributed in Central and South America.

The presence of this sexual dimorphism, the lack of insight in its ecology and evolution and the overall gap in knowledge about the biology of this group challenge our ongoing conservation work of these species in Mexico and other Latin American countries. In their recent review of sexual dimorphism in flowering plants, Barret & Hough (2013) discuss niche differences and spatial segregation of female and male plants, which we also have observed in *Cornidia*. Additionally, Vamosi & Vamosi (2005) mention that tropical dioecious woody plants might be more prone to extinction. Nevertheless, vegetative reproduction seems to be the rule in the majority of the *Cornidia* localities, and despite the massive seed production, we rarely observe juvenile plants, even not in large populations. In contrast, it is quite common to observe stolons, or runner shoots according to Nevling & Gómez-Pompa (1968), on the forest floor between several host trees. It is generally impossible to follow these runner shoots, but as already noted by these authors for *H. nebulicola* in the Mexican state of Veracruz, one individual might climb several trees. As a consequence, it is not evident to define individual plants versus populations.

Although the two species described above as well other species we are studying might be locally relatively abundant, they are restricted to the higher or even highest elevations in their respective distribution areas in cloud forest. The pristine habitat with very specific topographical conditions and the mycorrhiza (own observations) they require make them not only promising bio-indicators for this kind of habitat, but also highly endangered as these forests become rarer by the day, because they are highly appreciated by local people for agriculture and cattle. Additionally, logging for appreciated woods is also frequent in these habitats. However, the most dramatic cause that might bring several of these long-lived species to extinction in the near future is the current and future predicted climate change which is driving cloud forest species in eastern and southern Mexico towards upward migration to higher elevation (Rojas-Soto *et al.* 2012).

To conclude, although in recent years our knowledge of the morphology, biology and evolution of this group based on wild-collected plants has increased, much additional research in various disciplines is needed to build the basis for saving some of these botanical “Lonesome Georges” from extinction.

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