Morphological Variation and Palynomorphology of *Rosa laxa* in Xinjiang, China

Le Luo, Chao Yu¹, Xuelian Guo, Huitang Pan, and Qixiang Zhang

Beijing Key Laboratory of Ornamental Plants Germplasm Innovation and Molecular Breeding, Beijing Laboratory of Urban and Rural Ecological Environment, Key Laboratory of Genetics and Breeding in Forest Trees and Ornamental Plants of Ministry of Education, National Engineering Research Center for Floriculture, School of Landscape Architecture, Beijing Forestry University, Beijing 100083, China

**ABSTRACT.** *Rosa laxa* is widely distributed in the Xinjiang Uygur Autonomous Region of China and is highly adaptable and rich in variation. In this study, we investigated the morphology, habitats, and palynomorphology of *R. laxa* botanical varieties from Xinjiang, China. In addition to *R. laxa* var. *laxa*, there were three other botanical varieties of *R. laxa* growing in southern Xinjiang, including var. *mollis*, var. *kaschgarica*, and var. *tomurensis*. Together, these four botanical varieties exhibited morphological variation, mainly in the morphology of prickles and the glandular trichome and in flower color. The pollen grains of the *R. laxa* botanical varieties, all medium in size (21.77–48.39 μm), came in three shapes: prolate, prolate, and subspherical. Their pollen exine sculptures were characterized by either a striate-perforation pattern or striate pattern, but perforation varied in terms of diameter and density and striae varied in depth and density. Palynomorphological assessment showed that three types of evolution, i.e., primitive, transitive, and evolved, were present among *R. laxa* botanical varieties, and pollen dimorphism was observed in the same botanical variety. Prolate pollen with a dense striate pattern was the most evolved type. Based on morphological and palynomorphological investigations, var. *tomurensis* was considered to be the most evolved one among the studied botanical varieties.

As one of the biodiversity centers of wild *Rosa*, China is home to 95 species (65 endemic) of *Rosa*, accounting for nearly half of the world total (Ku and Kenneth, 2003). The Xinjiang Uygur Autonomous Region is a large and sparsely populated area located in the northwest of China covering 1.6 million km² (about one-sixth of the total land area of China). Separated by the Tianshan Mountains, north Xinjiang is characterized by temperate climate, whereas south Xinjiang possesses a warm temperate climate. These complex environments make Xinjiang host to a rich variety of plant species. Although officially 14 species (including three botanical varieties) of wild *Rosa* are found in this region (Ku and Kenneth, 2003), there may be as many as 22 wild *Rosa* species in the region (Bao, 1993; Liu, 1993; Liu and Cong, 2000; Ma and Chen, 1990).

There are about 50 species of *Rosa* section *Cinnamomeae*, 36 of which are in China (26 endemic) (Ku and Kenneth, 2003; Yu et al., 1985). *Rosa laxa* var. *laxa* is one of these 36 species, and it grows extensively in the Xinjiang region only. In addition to the var. *laxa*, three other botanical varieties of *R. laxa* are also known to grow in Xinjiang (Liu and Cong, 2000), although only *R. laxa* var. *mollis* is recorded in the *Flora Repubicae Popularis Sinicae* (Yu et al., 1985) and *Flora of China* (Ku and Kenneth, 2003). In the *Flora of China, R. laxa* is described as follows:

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*Corresponding authors. E-mail: yuchao@bjfu.edu.cn or zqxbjfu@126.com.

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2 Corresponding authors. E-mail: yuchao@bjfu.edu.cn or zqxbjfu@126.com.