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Morphological Characteristics of Tetraploid *Rosa multiflora* Obtained by Diploid Breeding

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Summary

This paper reports the results of a survey of morphological traits from derived tetraploid compared to diploid *R. multiflora* plants. Leaf length did not change between diploid and tetraploid plants, but leaf width and petal size did show significant increases.

INTRODUCTION

Rosa multiflora Thunb. is a wild rose species that grows wild from China to Japan. Although it is considered as one of the wild species that contributed to the establishment of horticultural varieties of rose, it still has value to be utilized again as a genetic resource to provide disease resistance and environmental stress tolerance. However, since most rose cultivars are tetraploid while *R. multiflora* is diploid, it is necessary to produce tetraploids of *R. multiflora* by polyploidization for obtaining fertile hybrid progeny. In this presentation, we report on the results of a survey of traits of tetraploid *R. multiflora*, which we have already obtained through our previous research, compared them with diploid.

RESULTS AND DISCUSSION

No clear differences were observed in budding and flowering time. In terms of leaf shape, diploids had thin, pointed leaflets with many spaces between leaflets, whereas tetraploids had rounded leaflets with overlapping other leaflets (**Fig. 1**).

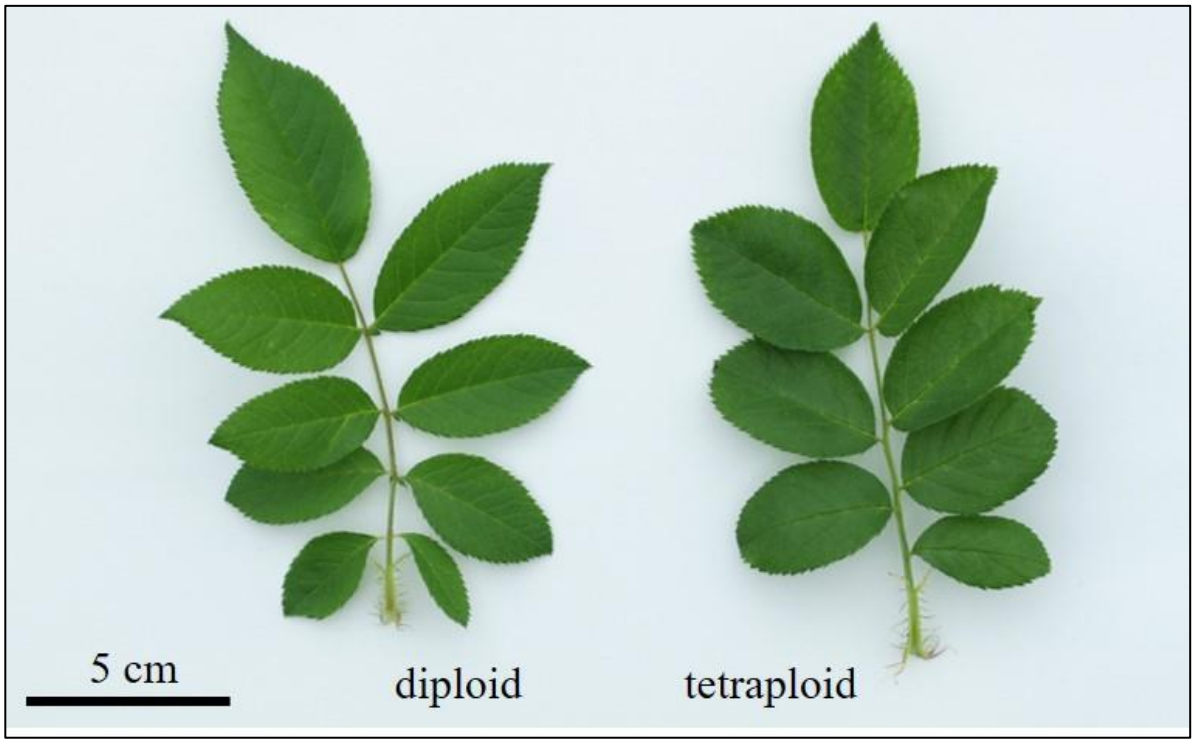

Figure 1. Leaves of diploid and tetraploid of *R. multiflora*

Focusing on the floral organs, the petals showed an increase in width only, as did the leaflets. As a result, the inflorescence of the diploid appeared to have many gaps between flowers, whereas that of the tetraploid appeared to be densely packed with flowers, giving a luxurious impression (**Fig. 2**).

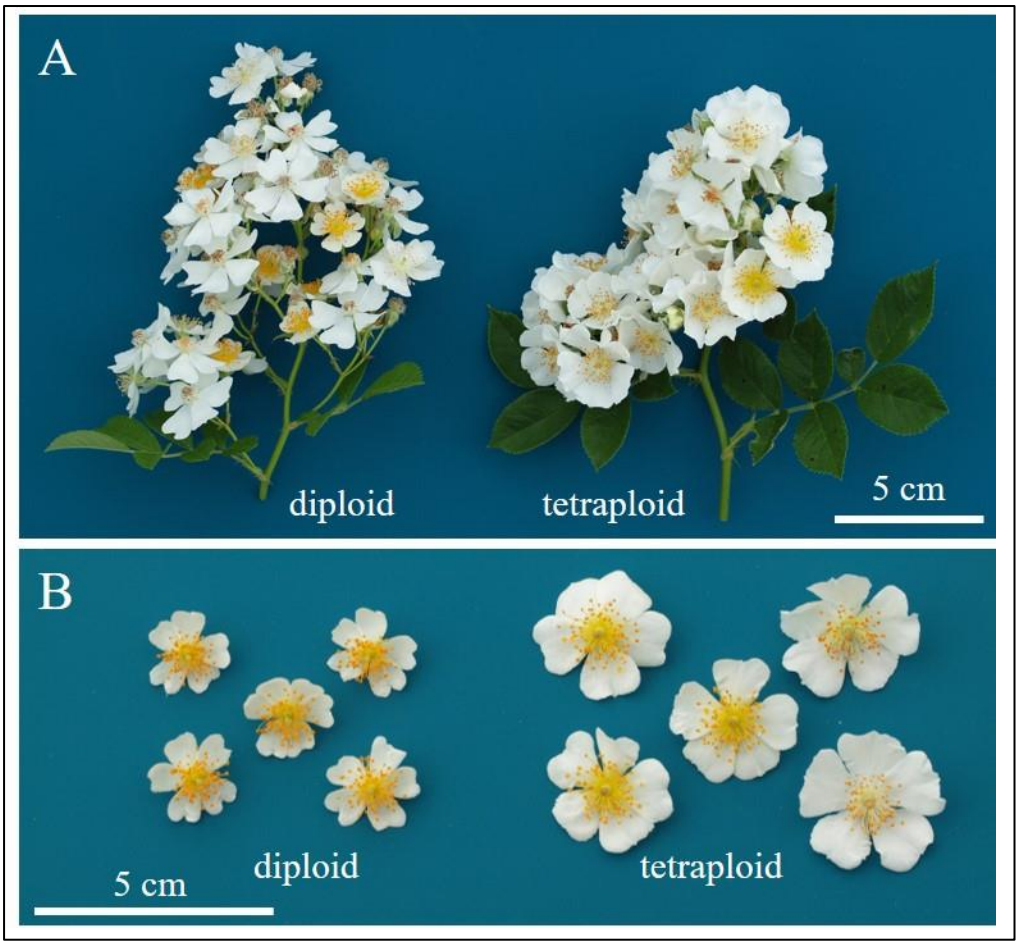

Figure 2. Flowers of diploid and tetraploid of *R. multiflora*. A. Inflorescence, B. Flower.

In plants in general, tetraploids do not change significantly in length of leaves and petals, while the width of leaves and petals increases compared to diploids. These changes were also conserved in *R. multiflora*.

This tetraploid was originally bred for the purpose of introducing disease resistance to rose cultivars. Our previous research suggested that the diploid and tetraploid tested in this study may differ in the degree of disease resistance, too. Future studies should compare not only morphology but also disease resistance and tolerance to environmental stresses.