



Root tip chromosome karyotype analysis of hyacinth cultivars

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ABSTRACT. Karyotype analysis in plants helps to reveal the affinity relationships of species and their genetic evolution. The current study aimed to observe chromosome karyotypes and structures of *Hyacinthus orientalis*. Twenty hyacinth cultivars were introduced from Holland, and their water-cultivated root tips were used as experimental samples. A solution of colchicine (0.02%) and 8-hydroxyquinoline (0.02 M) was used as a 20-h pre-treatment. Subsequently, Carnot I was used for fixation and 45% acetic acid was used for dissociation. The squash method was selected to prepare chromosome spreads for microscopic observation. The basic chromosome number of the hyacinth cultivar was 8, and the number of chromosomes in the diploid, triploid, tetraploid, and aneuploid cultivars was 16, 23, 24, 31, and 32, respectively. The L-type chromosome was predominant in the chromosomal composition. The hyacinth satellite was located on the short arm in numbers equivalent to the ploidy. This satellite is located on the middle-sized chromosome in the fourth group of chromosomes, demonstrating that *Hyacinthus* has a more primitive evolution than *Lilium* and *Polygonatum*. Among 20 hyacinth cultivars, 'Fondant' had the highest level of evolution and a maximum asymmetric coefficient of 61.69%. Moreover, the ratio

between the shortest and longest chromosomes in this cultivar was 4.40, and its karyotype was type 2C. This study may elucidate long-term homonym and synonym phenomena. It may also provide a method of cytological identification as well as direct proof of the high outcross compatibility between hyacinth cultivars.

Key words: Hyacinth; Chromosome; Diploid; Triploid; Tetraploid; Karyotype analysis