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Obtaining Triploid Plants of Sprekelia formosissima by Artificial Hybridization

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Abstract : Sprekelia formosissima (L.) Herbert is a bulbous ornamental species of the monocotyledonous Amaryllidaceae family, and it is a perennial, herbaceous monotypic plant commonly known as 'Aztec Lily' or 'Jacobean Lily'; it is distributed through Mexico and Guatemala. Its scarlet flowers with curved petals have made it an exceptional ornamental pot plant. Cytogenetic studies in this species have shown differences in chromosome number (2n=60, 120, 150, 180) with a basic number x=30. Different reports have shown a variable ploidy level (diploid, tetraploid, pentaploid and hexaploid); however, triploid plants have not been reported. In this work, triploid plants of S. formosissima were obtained by crossing tetraploid (2n=4x=120) with diploid (2n=2x=60) genotypes of this species; the seeds obtained from the crosses were placed in pots with a moist substrate made of Peat Moss: Vermiculite (7:3) for germination. Root tips were collected, and metaphasic chromosome preparations were performed. For chromosome counting, the best five metaphases obtained were photographed with a Leica DMRA2 microscope (Leica Microsystems, Germany) microscopy coupled to an Evolution QEI camera under phase contrast (Media-Cybernetics). Chromosomes counting in root-tip cells showed that 100% of the plants were triploid (2n=3x=90). Although tetraploid or pentaploid plants of S. formosissima are highly appreciated, they usually have lower growth rates than related diploid ones. For this reason, it is important to obtain triploid plants, which have advantages such as higher growth rates than tetraploid and pentaploid, larger flowers than those of the diploid plants and they are expected to not be able to produce seeds because their gametes are aneuploids. Furthermore, triploids may become very important for genomic research in the future, creating opportunities for discovering and monitoring genomic and transcriptomic changes in unbalanced genomes, hence the importance of this work.

Keywords : Amaryllidaceae, cytogenetics, ornamental, ploidy level
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