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Title: Origin and cytology of a novel cytotype of *Allium tuberosum* Rottl. ex Spreng. (2n = 48)

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Abstract

Naturally occurring/spontaneously produced polyploids with six/more genomes are rarely found in *Alliums*. A hexaploid form of *Allium tuberosum* with 2n = 48 chromosomes has been isolated for the first time amongst the open-pollinated seedlings of a hypotetraploid plant (2n = 4x = 31); latter being the seed-derived product of a normal tetraploid stock (2n = 4x = 32) growing in Jammu University Botanical Garden. Except for the guard cells and pollen grains that are of increased size, this form compared to its progenitor is dwarf, has smaller leaves and bears inflorescences with few flowers. This plant is also different from its progenitor in having nearly one-fourth (27.8 %) of its pollen mother cells (PMCs) with varying chromosome number viz. 27–64, with the remaining cells having somatic or double the somatic number of chromosomes. To assess the nature of hexaploid form, its chromosomes were studied for morphological details, putative grouping and pairing properties during reduction division. Morphological similarity in the chromosomes of the present cytotype and its progenitor, arrangement of 48 chromosomes in eight groups of six chromosomes each and presence of 21.88 % euploid cells with eight hexavalents pointed towards the autopolyploid nature of the present strain. Regarding the origin of this strain, observation made on the meiosis in the two sex mother cells of the progenitor provides some clues. In the later plant, presence of most of embryo-sac mother cells with 62 chromosomes that showed 31:31 segregations and existence of majority of the PMCs with 31 chromosomes exhibiting erratic segregations indicate that the hexaploid strain has probably originated as a result of the fusion of reduced male (n = 17) and unreduced female gamete (2n = 31).