The Investigation of Mitosis, Meiosis and Pollen Germination in Critically Endangered Plant *Amsonia orientalis* (*Apocynaceae*)

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**Objectives:** *Amsonia orientalis* Decne. is a medical and critically endangered plant which has very restricted distribution only in west of Turkey and east of Greece on the world. There was no report about its mitosis and its reproduction biology. Thus it is aimed to identify the mitosis in root apical meristem, meiosis in microsporogenesis and pollen germination.

**Materials and Methods:** The root tips of *A. orientalis* obtained from the tissue culture and the flower buds taken in April-May were fixed in Carnoy solution for 24h. Then they were transferred to 70% alcohol and stored in refrigerator until use. The root tips were hydrolysed in 1 N HCl at 60°C for 5–10 min followed by squashing in 2% aceto orcein. The flower buds were directly squashed in 1% aceto orcein. The prepared slides were kept in +4°C until examination. For pollen germination tests fresh flowers and a medium containing boric acid, sucrose and CaCl₂ was used. The germination percentages of pollen grains were calculated for 1-6, 12, 24 hours and pollen tube lengths were measured. The photographs of the slides were taken by Olympus BX51.

**Results:** Karyological information on *Amsonia* species is restricted mostly to chromosome counting. Based on our mitotic and meiotic studies, the basic chromosome number 11 (2n=22) was obtained. In spite of the small size of the cells and chromosomes, all the phases of mitosis and meiosis were observed. Generally the phases of mitosis were regular but there were a few abnormalities such as; laggard chromosome in metaphase and bridge formation in anaphase. There was a good relationship between the stages of pollen development and floral bud length. As a result of the cytokinesis isobilateral and tetrahedral types of tetrads were occurred in microsporogenesis. The tetrad nuclei resulting from the simultaneous type of meiosis were found to be of equal size. Pollen germination had started from the 1st hour, callose plug formations started form the 2nd hour and pollen tube lengths were regularly increased by the increasing time.

**Conclusion:** This is the first study that identifies the mitotic, meiotic cycles and pollen germination in *A. orientalis*. Our findings about the mitosis and reproduction biology of this critically endangered plant will be usefull for *in vitro* and *in situ* conservation studies.

Key words: *Amsonia orientalis*, critically endangered, mitosis, meiosis, pollen germination.

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