

**SEED DEVELOPMENT IN ASTRAGALUS CEMERINUS AND A. RUSCIFOLIUS
(FABACEAE), AND ITS SYSTEMATIC IMPLICATIONS**

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This study focuses on seed development in *Astragalus cemerinus* and *A. ruscifolius*, two endemic species of *Astragalus* in Iran. In both species the ovules are campylotropous, bitegmic and crassinucellate. Two polar nuclei fuse before fertilization, forming the diploid secondary nucleus. Division of the primary endosperm nucleus gives rise to coenocytic endosperm; however, part of it becomes cellular at the late globular stage. The first division of the zygote is transverse and the embryo proper forms after several divisions of the terminal cell. The mature suspensor consists of a mass of cells equal in size to the globular embryo proper, with several inflated cells towards its base. This massive suspensor seems to be plesiomorphic, as compared with the biseriata suspensor known only in section Incani. Abnormalities in the embryo proper as well as in the suspensor are observed at the globular stage. In both *A. cemerinus* and *A. ruscifolius*, fusion of the polar nuclei occurs in the median regions of the central cell and before fertilization occurs, as is the rule in most of the Papilionoideae, but in species of section Incani as in a few other species of the family, the polar nuclei approach the egg apparatus before fertilization and do not fuse until fertilization. The embryological characters of *A. cemerinus* and *A. ruscifolius* are compared with those of other species of *Astragalus*, and the taxonomic application of these characters as well as their phylogenetic significance are discussed.

Key words: Abnormal embryology, *Astragalus cemerinus*, *Astragalus ruscifolius*, megagametophyte, embryo proper, suspensor, phylogeny.