# Phenetic study of *Trifolium* species using pollen grain characters

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## Abstract

Iran is one of centers of diversity for Trifolium species in Asia with 49 species in 6 sections . There are high similarities between species specially in calyx tube, so taxonomic identification are difficult. In this research, major pollen grain characters were studied in 34 species of this genus by used Scaning Electron Microscopy (S.E.M). The results showed that, pollen grains are trizoncolporate, the equatorial view was oblong to circular shapes and sculpture of exine were reticulate, irregular reticulate, perforate, scrobiculate and foveolate. T. tomentosum and T. bullatum was distinguished with their sculptures, also in T. campestre exine surface was reticulate but in T. aureum was regulate. In the other hand, T. pilulare has the most different sculpture between other species. Based on cluster analysis, two main groups were detected. One cluster is containing both species of Vesicaria and Trifolium sections and another clade divided into three subclades, but the species of all sections are complex .Our results showed that Trifolium is the heterogenous with variation in morphology and pollen grain.

**Keywords:** Iran, Pollen, Trifolium