

Title Histological and pomological characterization of sclereid cell clusters in some Local Iranian and European Pear (*Pyrus communis* L.) cultivars

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Abstract

Sclereid cell clusters are significant character of pear fruits, both in Asian (*Pyrus pyrifolia*) and European cultivars (*Pyrus communis*). The dispersal and form of sclereid clusters affects texture and fruit quality of pear cultivars. This research was carried out to evaluate histological and pomological characterization of 5 local and 23 European pear cultivars from Iranian National Pyrus Collection, established in Karaj. Histological evaluation of sclereids was performed microscopically by newmethylene blue staining of fruit tissue, demonstrated better results than toluidine blue staining procedure. The pomological evaluation of fruits was based on UPOV descriptor and their correlations with sclereids characterizations were statistically determined. Among tested cultivars, two cvs. Felestini and Red Bartlett showed the lowest and highest sclereid cluster per sample, while two cvs. Felestini and Shahak demonstrated the lowest and highest sclereid cell per cluster, respectively. All cultivars had brachy sclereid forms at the clusters. The most correlated character with sclereid cluster density was fruit size and volume, genetically small fruit bearing cultivars demonstrated higher sclereid cluster density. The results also revealed that sclereid differentiation occurs in primary fruit development phase, before cell division termination that usually in pear fruits are not longer than 60 days. Therefore, more cell enlargement inducing condition resulting in decrease the sclereid density in pear fruits. No correlation observed between fruit juiciness or texture and sclereid characteristics in this research.