



IMPACTS OF COLCHICINE ON PHYSIOLOGICAL TRAITS IN
LEMON BALM (*MELISSA OFFICINALIS* L.)

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Lemon balm (*Melissa officinalis* L.) is an important medicinal plant in the family Lamiaceae that is blessed with bioactive compounds [1]. In vitro induction of polyploidy using mutation agents is one of the medicinal plant breeding methods which have been employed to increase potential of secondary metabolites production [2]. The objective of present study was to investigate the impacts of different concentration and exposure times of colchicine on physiological traits in *Melissa officinalis*. In this regard, a factorial experiment was carried out based on randomized complete block design with two factors and three replicates. The factors were four different concentration of colchicine (control, 0.05%, 0.1% and 0.2%) and three exposure times of colchicine (24, 48 and 72 h). The results indicated that different concentration of colchicine had significant effect on the Chl.a, Chl.b, carotenoid, rosmarinic acid, phenol and flavenoid contents. The exposure times of colchicine also caused significant changes in anthocyanins, phenol, flavenoid, Chl.a, Chl.b, carotenoid, rosmarinic acid amounts ($P \leq 0.01$). Increasing in colchicine concentration, significantly increased mentioned physiological traits at 0.05% and 0.1% colchicine concentration in comparison to the control ($P \leq 0.01$). In contrast, the interaction of colchicine concentration and exposure time had significant effect on Chl.a, Chl.b, carotenoid, rosmarinic acid amounts. In agreement with the reports of Da Silva, et al. [3] the findings of this study indicated that estimation of physiological changes, size of stomata, contents of chlorophyll a, b and total of chlorophyll and secondary metabolites amount is an effective method in primary screening of polyploid plants in polyploidisation breeding program and it is recommended flow cytometry to be used for accurate identification of ploidy level in *Melissa officinalis*.

References

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