

## **Rhizome-Soaking with Plant-Derived Smoke-Water (PdsW) And Karrikinolide Boosts the Essential-Oil Yield, Active Constituents and Leaf Physiological Parameters of Mentha Arvensis L**

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**Abstract :** Mentha arvensis L. (Japanese mint) is a perennial plant carrying medicinal, aromatic, antiseptic, and anaesthetic properties. Plant-derived smoke-water (PDSW) plays a significant role in seed germination, seedling growth, and other physiological attributes. To ascertain the effect of PDSW and karrikinolide on Mentha arvensis L., a rhizome-soaking experiment was conducted on Mentha arvensis. Prior to planting, mint rhizomes were soaked for 24 hours with aqueous solutions of various concentrations of PDSW (1:125v/v, 1:250 v/v, 1:500 v/v, and 1:1000 v/v), karrikinolide ( $10^{-6}$ M,  $10^{-7}$ M,  $10^{-8}$ M, and  $10^{-9}$ M) using double distilled water as control treatment. Rhizome soaking with 1:500 v/v concentration of PDSW and  $10^{-8}$ M concentration of KAR1 increased the growth attributes, including plant height, fresh weight, dry, leaf area, and leaf yield per plant of Mentha arvensis. Leaf physiological-parameters, viz. chlorophyll fluorescence, PSII activity, and total chlorophyll and carotenoid content, were also increased as a result of the application of this treatment PDSW (1:500 v/v) and KAR1 ( $10^{-8}$ M). In addition, treatment with 1:500 v/v and  $10^{-8}$ M significantly increased the essential oil yield and active constituents of Mentha arvensis compared to the control. Results indicated that PDSW, being a cheap source of karrikins, might be successfully used to augment mint essential oil production.

**Keywords :** active constituents, essential oil, medicinal plant, mentha arvensis L

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