

# EFFECT OF HARVESTING AGE AND DRYING METHODS ON ESSENTIAL OIL YIELD OF ROSEMARY (*Rosmarinus officinalis* L.) LEAVES IN WONDO GENET,

## ETHIOPIA

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*Rosmarinus officinalis* L. is extensively used in Ethiopian cuisine for flavoring dishes like roasted meats and spice blends. This study aimed to analyze how harvesting age and drying methods affect the essential oil content of rosemary leaves. Employing a 3 × 4 factorial design with 3 replications, this research explored the effects of harvesting age and drying methods on extracted essential oil yields from rosemary leaves. Data underwent a two-way ANOVA analysis using SAS software, with statistical significance set at  $P < 0.05$ . Harvesting age, drying methods, and their interactions significantly impacted rosemary leaf essential oil content ( $P < 0.05$ ). Leaves harvested at 6 months after transplanting (MAT) exhibited the lowest essential oil content volume per weight (EOCV/W) for both fresh ( $0.55 \pm 0.21\%$ ) and dry ( $1.34 \pm 0.52\%$ ) leaves, as well as essential oil content weight per weight (EOCW/W) for fresh ( $0.50 \pm 0.17\%$ ) and dry ( $1.22 \pm 0.43\%$ ) leaves. Leaves collected at 12 MAT displayed the highest EOCV/W (fresh:  $0.96 \pm 0.27\%$ ; dry:  $2.29 \pm 0.69\%$ ) and EOCW/W (fresh:  $0.84 \pm 0.24\%$ ; dry:  $2.01 \pm 0.60\%$ ) values. Intermediate values emerged for leaves harvested at 18 MAT, with EOCV/W (fresh:  $0.84 \pm 0.16\%$ ; dry:  $2.14 \pm 0.43\%$ ) and EOCW/W (fresh:  $0.74 \pm 0.14\%$ ; dry:  $1.88 \pm 0.37\%$ ). During oven, sun, and shade drying processes, the mean EOCV/W losses for fresh leaves were 26.45, 27.72, and 25.19%, respectively, while EOCW/W losses were 27.12, 31.94, and 30.22%. For dry leaves, EOCV/W losses were 5.85, 7.32, and 8.62%, while EOCW/W losses were 10.41% and 29.31%, respectively, compared to the essential oil content of fresh leaves. Optimal rosemary leaf harvesting occurred at 12 MAT, utilizing fresh- and shade-dried methods for essential oil extraction via hydro distillation. Harvesting at one year post-transplanting, along with oil extraction from fresh- and shade-dried leaves, proved most efficient. These findings hold significance for enhancing rosemary essential oil production in both pharmaceutical and culinary sectors.