

CORRELATION MATRIX AND OPTIMIZATION OF PHENOPHASES IN *Tagetes minuta* GROWN IN SUBTROPICAL ENVIRONMENT OF JAMMU, INDIA

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ABSTRACT

Tagetes minuta is considered as the best source of valuable essential oil than other species of the genus growing in India. The presence of the acyclic monoterpene ketones viz., Tagetone (Z, E) and dihydrotagetone in the oil are good source of base material for the synthesis of value added aroma chemicals. *Tagetes minuta* is found to be grown in both wild and cultivated forms in Jammu region of J&K and opens a thrust area of research to be undertaken. Growth and development studies based on regional crop models have been quantified on the ketone containing species of tagetes at subtropical environment for better understanding of distinct phenological stage. Correlation behaviour of oil yield with various morphoeconomic parameters and optimization of phenophase for maximum oil yield corresponding maximum tagetone and dihydrotagetone content (%) was founded. A marked decrease in essential oil production (11.86%) existed at 95% flowering and initiation of leaf senescence and shedding stage. 4155.3 degree days were utilized for the production of *Tagetes minuta* plant with maximal oil, flower and herbage yield in terms of better quality of oil i.e., Dihydrotagetone (%) and Tagetone (%). Interrelationship of various morphometric characters revealed that all characters had positive association among themselves indicating that improvement in one component character could lead to the concurrent improvement of the other. Maximum essential oil production 70.81 kg/ha having dihydrotagetone (44.42%) and tagetone (16.40%) was obtained at 95% flowering stage. The percentage variation in the monoterpene ketones was found as dihydrotagetone (31.44%) and tagetone as (9-16%) at various phenophases. The study further helps in determining optimal period of harvest and orient harvest schedules through out the growth period.

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Key words : *Tagetes minuta*, Phenophases, Monoterpene Ketones, Harvest schedule.

Genus tagetes belongs to the *Asteraceae* family out of which *Tagetes minuta* L. is considered as the best source of essential oil than other species of genus growing in India. (Chopra *et al.*, 1963). The essential oil produced in mid hill regions (H.P., J&K, U.P. state) growing wildly is found to have a balanced ratio of monoterpene ketones, which are responsible for the better olfactory value of the oil than that produced from plain areas of U.P. and Punjab with low oil factory value. The presence of the acyclic nonoterpene ketones viz., Tagetone (Z,E) and dihydrotagetone in the oil are good source of base material for the synthesis of value added aroma chemical, get easily polymerised and deteriorate the quality of oil but synthetically prepared same compounds are found somewhat stable (Hethelyi, 1986). Growth and development studies based on regional crop models have been quantified on this ketone containing species of tagetes

at subtropical environment for better understanding of distinct phenological stage and correlation behaviour of oil yield with various morphoeconomic parameters and optimization of phenophases for maximum oil yield corresponding max. tagetone and dihydrotagetone content (%).

MATERIALS AND METHODS

Plant Material :

Plant samples of *Tagetes minuta* L. were collected from hills of Himachal Pradesh and J&K growing in wild and planted vegetatively through seedlings at Field Research Farm of Agricultural University, SKUAST, Jammu on April, 05, 2005. This region lies 32° 44' latitude (N) and 75° 55' longitude (E). The altitude of the area is 300 meter above sea level and soil is acidic in reaction having pH 6.79 and sandy clay loam in texture with organic carbon (0.17%) available nitrogen (105 kg/ha), available phosphorus (21.88 kg/ha) and available potash (157.5 kg/ha).