The essential oil of *Rosa damascena* Mill. is one of the most valuable and important base material in the flavor and fragrance industry. The aim of this study was to determine the effects of harvest date, fermentation duration and Tween 20 treatment on the essential oil content and composition of the rose petals. The essential oil content and composition were significantly different in the petals harvested at various dates (May 24, June 1, 8, and 15, 2002). The highest oil content was found on May 24 harvest (0.040%), and then a gradual decrease was observed up to last harvest date (0.032%). The highest percentages of geraniol, nerol, and phenylethyl alcohol were obtained from the petals harvested on May 24. However, the highest percentages of citronellol and linalool were found from the petals harvested on June 8. The petals collected freshly were fermented for various duration (0, 12, 24, and 36 h) at 25°C in sacks. The highest essential oil content was found in the non-fermented petals. As fermentation duration increased, essential oil content gradually decreased. The most significant changes during the fermentation were observed in citronellol and geraniol contents. Citronellol/geraniol (C/G) ratio increased from 0.57 to 10.31 throughout the fermentation. In the other experiment, Tween 20 was added into the distillation water at various concentrations (0, 1000, 2500, and 5000 ppm).
Although Tween 20 generally raised the contents of essential oil, it did not significantly influence the oil composition. The highest oil content (0.045%) was obtained from the distillation treated with 2500 ppm of Tween 20. Oil content had high positive correlations with geraniol and linalool contents (r = 0.55 and 0.53, respectively), but high negative correlation with citronellol content (r = -0.48).