

## DETERMINATION OF FAT-SOLUBLE VITAMINS IN CORN OIL MACERATES OF *HYPERICUM PERFORATUM* AND *MATRICARIA RECUTITA*

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Fat-soluble vitamins are among the most important biologically active compounds in food, pharmaceutical and cosmetic formulations. Their role is connected both with nutritional functions and with protection of oils against oxidation. Vitamin A and its esters regulate epithelial growth and participate in antioxidant defence. Vitamin E, mainly represented by  $\alpha$ -tocopherol, is considered the strongest natural lipid-soluble antioxidant in plant oils (Niki, 2014).  $\beta$ -Carotene provides provitamin A activity and contributes to radical scavenging (Shahidi & Zhong, 2010). Herbal oil macerates are increasingly used in cosmetics as natural carriers of such vitamins, but systematic data on their composition are limited.

The aim of this study was to determine the content of vitamin A, vitamin E (tocopherols), and  $\beta$ -carotene in corn oil macerates of *Hypericum perforatum* (klamathweed) and *Matricaria recutita* (chamomile). The study used commercial corn oil macerates of *H. perforatum* and *M. recutita* (Leko Style Ltd., Kyiv, Ukraine), obtained by infusion of dried plant material in refined, deodorised corn oil. For HPLC determination, 0.50 g of oil was dissolved in n-hexane, filtered, and injected into an Agilent 1260 Infinity system equipped with a Zorbax Eclipse XDB-C18 column (250 × 4.6 mm, 5  $\mu$ m). The mobile phase was methanol:water (95:5,v/v), isocratic elution, flow rate 1.0 mL/min, column temperature 25°C. Detection was carried out at 325 nm for retinol, 292 nm for  $\alpha$ -tocopherol, and 450 nm for  $\beta$ -carotene. Quantification used the external standard method with reference compounds (retinyl acetate,  $\alpha$ -tocopheryl acetate,  $\beta$ -carotene, Sigma-Aldrich, purity  $\geq 97\%$ ). All analyses were repeated in triplicate; data are presented as mean  $\pm$  SD. Vitamin A (retinol) was detected only in *H. perforatum* macerate (0.78 mg/kg), while in *M. recutita* its concentration was below the detection limit. This indicates that chamomile macerates are poor carriers of vitamin A.  $\beta$ -Carotene was determined at 0.49 mg/kg in *H. perforatum* and 0.26 mg/kg in *M. recutita*. Both values are relatively low, consistent with earlier studies on refined oils (Chabni et al., 2024).

The tocopherol profile showed a strong predominance of  $\alpha$ -tocopherol, reaching 514 mg/kg in *H. perforatum* and 509 mg/kg in *M. recutita*. Minor amounts of  $\gamma$ -tocopherol (15.1 mg/kg) and  $\delta$ -tocopherol (7.3–8.1 mg/kg) were also present. This distribution agrees with reports that  $\alpha$ -tocopherol is the dominant antioxidant in refined vegetable oils (Athanasiadis et al., 2023). The high concentration of  $\alpha$ -tocopherol ensures strong oxidative protection, although the low diversity of tocopherols may limit long-term stability under storage stress.

In summary, corn oil macerates of *H. perforatum* and *M. recutita* contain high levels of  $\alpha$ -tocopherol as the key antioxidant. Retinol and  $\beta$ -carotene were found in small amounts, with slightly higher values in *H. perforatum*. The results confirm that the antioxidant stability of these macerates mainly depends on  $\alpha$ -tocopherol, while their provitamin A contribution is limited. These findings are useful for the further application of herbal macerates in cosmetic and nutraceutical products.

### REFERENCES

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