

# CAROTENOIDS OF POLLEN PELLETS FROM CERTAIN PLANTS

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We have studied the composition of the carotenoids of the pollen pellets collected by bees from *Taraxacum officinale* Wigg. (common dandelion), *Crepis tectorum* L (narrow-leaf hawk's-beard), and *Trifolium repens* L. (white clover).

The carotenoids were extracted from the pollen with 86% ethanol at room temperature. The extracts were concentrated in vacuum and the residue was treated with hexane or chloroform. (In the case of treatment with chloroform, the solvent was distilled off and the residue was treated with hexane).

The hexane extracts were chromatographed in a thin layer of alumina (activity grade II) in the following systems: 1) hexane-diethyl ether (7.0:3.0); 2) hexane-diethyl ether (7.5:2.5), in the presence of markers.

Chromatography under the same conditions was used for the preparative separation of the carotenoids. The zones were eluted with ethanol and hexane, the eluates were purified by rechromatography, and they were investigated with the aid of UV spectroscopy before and after the saponification of the carotenoid esters.

Saponification was carried out with the aid of a 5% ethanolic solution of KOH at room temperature for 10-12 h. The hydrolysate was diluted with a threefold amount of water and the carotenoids were extracted with hexane and the higher fatty acids with diethyl ether after acidification.

The acids were identified by chromatography on paper impregnated with a 10% solution of paraffin oil in benzene in the 98% CH<sub>3</sub>OOH system. The acids were revealed on the chromatograms with an ammoniacal solution of silver and a 1% solution of potassium permanganate [1].

In the pollen pellets from white clover we found  $\alpha$ -carotene,  $R_f$  0.67 (system 1),  $\lambda_{\max}^{C_{2}H_5OH}$  447, 477 nm;  $\gamma$ -carotene,  $R_f$  0.58,  $\lambda_{\max}^{C_{2}H_5OH}$  405, 431, 459 nm; lycopene,  $R_f$  0.52  $\lambda_{\max}^{C_{2}H_5OH}$  447-470, 502 nm; and rubixanthin,  $R_f$  0.40,  $\lambda_{\max}^{C_{2}H_5OH}$  441, 476, 510 nm. In a pollen pellet from narrow-leaf hawk's-beard we detected  $\alpha$ - and  $\gamma$ -carotenes, violaxanthin,  $R_f$  0.10, and three esters of violaxanthin: a) the palmitate,  $R_f$  0.21; b) the linoleate,  $R_f$  0.40; and c) the double linoleate-linolenate  $R_f$  0.56. In the dandelion pollen we detected violaxanthin linoleate-linolenate with  $R_f$  0.56.

## LITERATURE CITED

1. E. K. Alimova and G. D. Bolgova, *Biokhimiya*, 22, No. 3, 568 (1957).