

CAROTINOIDS FROM *Astragalus falcatus*

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Leaves and flowers of *Astragalus falcatus* Lam. provide a source of flaronin [1]. The wastes contain flavonoids and cycloartanes [2] in addition to a significant quantity of lipochromic substances, carotinoids. Elucidation of their chemical structures is of interest.

The total lipophilic substances were isolated by CHCl_3 extraction of the aqueous alcohol extract of air-dried *A. falcatus* raw material after distillation of the alcohol. The CHCl_3 was distilled off. The resinous residue (200 g) was purified of chlorophyll on inactivated Al_2O_3 by elution with ethanol (60%). Yield, 0.85 g of a fraction containing the total carotinoids.

Column and preparative chromatography over silica gel (L 0.1-0.16, Czech Rep.) using the systems chloroform:petroleum ether (1:10) (1) and hexane:acetone (96:4) afforded four carotinoids. The pigments were detected on the plates by their color and development by iodine vapor.

Three components were identified based on qualitative reactions, TLC in the presence of authentic samples, melting points, optical activity, absorption maxima in UV spectra in the range 200-700 nm, and comparison with the literature [3].

Compound 1, yellow crystals; mp 180-182°C; optically inactive; λ_{max} (CHCl_3 , nm): 465, 496; λ_{max} (C_6H_{14} , nm): 423, 450, 480. It appears on TLC on Silufol UV-254 plates at the level of authentic β -carotene. Mixed samples do not have depressed melting points. **1** was identified as β -carotene [3, 4].

Compound 2, brick-red crystals, mp 191-193.5°C; $[\alpha]_{\text{D}}^{20} +160.5^\circ$ (*c* 1.0, CHCl_3); λ_{max} (CHCl_3 , nm): 428, 455, 487; λ_{max} (C_6H_{14} , nm): 419, 446, 448sh. A solution in H_2SO_4 (conc.) acquires a green color and gradually turns to blue. The chromatographic mobility is analogous to lutein. **2** was characterized as lutein [3, 4].

Compound 3, yellow needle-like crystals; mp 206-207°C (MeOH); $[\alpha]_{\text{D}}^{20} -39.5$ to -50° (*c* 0.1, CHCl_3); λ_{max} (CHCl_3 , nm): 428, 463, 493; λ_{max} (C_6H_{14} , nm): 423, 452, 483. It acquires a dark red color in H_2SO_4 (conc.). It appears on TLC at the level of authentic zeaxanthine, which was isolated previously from *Yucca gloriosa* [5].

Thus, β -carotene, lutein, and zeaxanthine are isolated for the first time from leaves and flowers of *A. falcatus* Lam. growing in Georgia.

REFERENCES

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