PRELIMINARY STUDIES ON A FLAVONOID PIGMENT FROM THE FRUIT OF PLATANUS OCCIDENTALIS

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In the course of a search for new sources of flavonoid compounds in nature, the fruit of the sycamore tree *(Platanus occidentalis)* has been investigated.

Experimental

One hundred grams of the shredded sycamore fruit (collected in the late fall of 1949) was extracted with 1 liter of boiling 95% ethyl alcohol. The filtered extract was concentrated to a thick mush and then extracted with 250 ml. of acetone. The cooled solution was filtered and a considerable amount of nonflavonoid material removed by addition of normal lead acetate solution. The flavonoid fraction was then precipitated by addition of basic lead acetate solution. The lead salt was collected, suspended in alcohol and decomposed with sulfuric acid. The alcoholic filtrate was diluted with sufficient water to form an approximately 70% alcohol-30% water solution. The aqueous-alcohol solution was thoroughly extracted with low-boiling petroleum ether. The petroleum ether extraction removed a small amount of water insoluble waxes. The residual alcohol-water solution was heated to boiling and hot water added to incipient cloudiness. The solution was allowed to cool to room temperature and then placed in the refrigerator. A reddish yellow precipitate slowly formed in the flask. After one week in the refrigerator, the sample was filtered and the precipitate dissolved in alcohol and again precipitated with water. A dull yellow precipitate deposited during the course of several days. This material was collected by centrifugation, washed with cold, 50% aqueous alcohol and air-dried. Approximately 20 mg. of the flavonoid was obtained from 100 gm. of sycamore fruit. The melting point of this material was not sharp. Softening and discoloration commenced at 137° C. and continued to 147° C. Above 147° C., a more rapid fusion of the sample occurred and a black, viscous liquid was formed.

The R_f values listed in Table I were obtained with an alcohol solution of the pigment. Whatman No. 1 filter paper was used for the paper chromatograms.

TABLE I

R_f Values of the Sycamore Flavonoid

Ethyl acetate-water[a]	.96
Phenol-water[a]	.95
Cresol-water[a,b]	.98
Butanol-acetic acid-water (40-10-50 volume %)	.94
Chloroform-isopropyl alcohol-water (20-40-40 volume %)	.11

[a]The organic solvent was saturated with water.
[b]Eastman Technical grade (54% meta, 17% para, 29% other phenols) was distilled over zinc dust. The fraction boiling at 200-202° C was collected for use.

The ultraviolet absorption spectrum of the sycamore flavonoid was obtained on a suitably diluted sample in ethyl alcohol solution. Absorption maxima were observed at 262, 295 and 370 mu. Absorption minima were observed at 245 and 317-318 $m\mu$. The presence of a small absorption maximum in the region 290-310 $m\mu$ is very indicative of a flavonol (3-hydroxy flavone) structure.

In an effort to obtain larger amounts of this flavonoid material, large scale extraction procedures were attempted with the green fruit gathered during the early summer season of 1950. Several modifications in procedure were instituted, including the use of hot water for the initial extraction of the pigment. In the latter method, the water extract was filtered and then concentrated to a small volume in a flash evaporator. Ether extraction of the concentrated water extract removed the flavonoid fraction along with considerable amounts of waxes and tarry materials. A satisfactory procedure for the final purification of the flavonoid material obtained from the green fruit has not been developed. Paper chromatography of the crude material

obtained from green fruit has indicated that a different flavonoid is present at this stage of growth.

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