

FOUR FLAVONOIDS AND THREE OTHER CONSTITUENTS FROM
ACHILLEA BIEBERSTEINII

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Chemical examination of *Achillea biebersteinii* Afan. showed the presence of 2-tricosanone, patulitrin, quercetagitrin, and jaceidin—all seen for the first time in *Achillea*. Quercimeritrin, 1-hexacosanol, and *n*-pentacosane, present in other *Achillea* species (1,2), were also found in *A. biebersteinii*.

EXPERIMENTAL

PLANT MATERIAL.—The plant was collected from areas next to the highway, between Ankara-Çankırı and Çankırı-Kalecik, Turkey. Voucher specimens (No. 1689) are deposited in the Herbarium of the Pharmacognosy Department, Hacettepe University, Faculty of Pharmacy, Ankara, Turkey.

EXTRACTION AND ISOLATION OF FLAVONOIDS.—Dried capitula (1 kg) were worked up by standard procedures (1-4). The compounds obtained from the plant are 2-tricosanone (189 mg), 1-hexacosanol (167 mg), *n*-pentacosane (158 mg), jaceidin (13 mg), patulitrin (15 mg), quercetagitrin (20 mg), and quercimeritrin (5 mg).

The flavonoids were identified by standard spectral (uv, ms, pmr, ir) and hydrolytic methods, as well as by comparisons with authentic samples and color reactions (3-6). The structures of the remaining three compounds were established by spectral methods (pmr, ir) and elemental analysis.

Full details of the examination can be obtained on request to the senior author.

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LITERATURE CITED

1. C. Ivanov and L. Yankov, *God. Vissb. Khimikotekhnol. Inst., Sofia* 1967, **14**, 73 (1970).
2. T.S. Zurabishvili, *Khim. Prir. Soedin*, **10**, 253 (1974).
3. K.R. Markham, "Isolation Techniques for Flavonoids," in: J.B. Harborne, T.J. Mabry, and H. Mabry, "The Flavonoids," London: Chapman and Hall Ltd., 1975.
4. T.A. Geissman, "The Chemistry of Flavonoid Compounds," New York: The Macmillan Company, 1962.
5. J.B. Harborne, "Phytochemical Methods," London: Chapman and Hall Ltd., 1973.
6. J.B. Harborne, T.J. Mabry, and H. Mabry, "The Flavonoids," London: Chapman and Hall Ltd., 1975.

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