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**STUDIES ON THE ANTHRAQUINONES
OF RHAMNUS
CORNIFOLIUS Boiss. & Hoh.**

Maksut COŞKUN (*)

Peter G. WATERMAN ()**

Summary: Three anthraquinone aglycones (Chrysophanol, Physcion and Emodin) were isolated from the bark of *Rhamnus cornifolius* and their structures were elucidated by chromatographic and spectroscopic methods.

Key Words : *Rhamnus cornifolius, Anthraquinones.*

**RHAMNUS CORNIFOLIUS Boiss. & Hoh.
ANTRAKİNONLARI ÜZERİNDE ÇALIŞMALAR**

Özet: *Rhamnus cornifolius* kabuklarından izole edilen antrakinon aglikonlarından Krizofanol, Fiskiyon ve Emodin'in yapıları kromatografik ve spektroskopik metodların yardımıyla tayin edilmiştir.

Anahtar Kelimeler: *Rhamnus cornifolius, Antrakinon.*

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(*) Ankara University, Faculty of Pharmacy, Tandoğan 06100, Ankara/TURKEY

(**) Phytochemistry Research Laboratories, University of Strathclyde, Glasgow, G1 1XW, SCOTLAND, U.K.

INTRODUCTION

The barks of *Rhamnus* species are used as a mild laxative in therapy. 21 species of *Rhamnus* were recorded from Turkey. *Rhamnus cornifolius* Boiss. & Hoh. grows in South East Anatolia near Hakkari (1).

In the previous paper we reported the quantitative and qualitative studies on the barks of 16 *Rhamnus* species from South and East Anatolia (2,3). Furthermore, some known and new anthraquinones and flavones were reported from *R. pallasii* and *R. libanoticus* (4-6).

EXPERIMENTAL

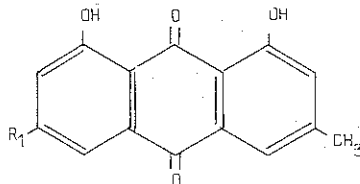
All the melting points were taken on a Yanagimota micro-melting-point apparatus and are uncorrected. The Ultraviolet (UV) spectra were taken on a Hitachi Model 150-20 spectrophotometer and the Infrared (IR) spectra were obtained on a Hitachi Model 270-30 spectrophotometer. The mass spectra (MS) were obtained on a Hitachi model RMU-7L spectrometer. Column chromatography was performed on Silica gel (Merck, 70-230 Mesh).

Plant Material: The barks of *R. cornifolius* were collected from Hakkari, Yüksekova, Vargöz, 1880 m, 30.9.1982. A voucher specimen was kept in "Ankara Üniversitesi Eczacılık Fakültesi Herbaryumu-AEF".

Extraction and Isolation: The moderately powdered dried barks (1 kg) were extracted with methanol under the reflux condenser for ten hours. The methanolic extract was concentrated in vacuo, yielded brown green mass. The concentrated extract was dissolved in MeOH-H₂O

(10:90) and successively extracted with CHCl₃, EtOAc and n-BuOH. The dried CHCl₃ layer (13 g) was first dispersed in 25 g silica gel then chromatographed on silica gel column and eluted with petroleum spirit (40-60°)-EtOAc-MeOH (85:14:1) and their mixtures increasing polarities until (85:10:5) used as final concentration.

40 fractions, 50 ml of each were collected and examined by thin layer chromatography (Silica gel pre-coated plate, Merck). Fractions 3-30 gave compounds I (80 mg), II (105 mg) and III (180 mg).



$R_1 = \text{H}$ I (Chrysophanol)

$R_1 = \text{OCH}_3$ II (Physcion)

$R_1 = \text{OH}$ III (Emodin)

Chrysophanol (I); Orange needles from ether, m.p. 191-193°C. UV $\lambda_{\text{max}}^{\text{EtOH}}$ nm: 225, 254, 287, 429. IR $\nu_{\text{max}}^{\text{KBr}}$ cm⁻¹: 1628, 1478, 1372, 1272, 1206, 1162. MS: 254 (C₁₅H₁₀O₄). This compound was identified as chrysophanol by direct comparison (TLC, HPLC, m.p. UV, IR) with authentic sample.

Physcion (II); Orange-red crystal from ether-chloroform, m.p. 207-209°C. UV $\lambda_{\text{max}}^{\text{EtOH}}$ nm: 223, 254, 265, 287, 433. IR $\nu_{\text{max}}^{\text{KBr}}$ cm⁻¹: 1630, 1480, 1368, 1326, 1274, 1226, 1162. MS: 284 (C₁₆H₁₂O₅). All of the spectral evidences (UV, IR) were identical with authentic physcion.

Emodin (III); Red needles from CHCl_3 -EtOAc, m.p. 261-263°C. UV $\lambda_{\text{max}}^{\text{EtOH}}$ nm: 221, 252, 265, 290, 438. IR $\nu_{\text{max}}^{\text{KBr}}$ cm^{-1} : 3400, 1624, 1480, 1372, 1334, 1274, 1216, 1166. MS: 270 ($\text{C}_{15}\text{H}_{10}\text{O}_5$). This compound was identified as emodin by direct comparison (TLC, HPLC, m.p., UV, IR,) with authentic sample.

RESULTS

In this study the barks of *R. cornifolius* were extracted with MeOH. Dried methanolic extract was suspended in $\text{H}_2\text{O}:\text{MeOH}$ (90-10) and then extracted with CHCl_3 , EtOAc, and n-BuOH respectively. The CHCl_3 extract was subjected to repeated column chromatography on silica gel and yielded compounds I-III.

I, II and III were shown to be chrysophanol, physcion and emodin, respectively by comparison with authentic samples and spectral data.

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Bilmek, ileriye görmek; ileriye görmek, güçlü olmaktır.

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