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# ACACETIN-7-*O*-RUTINOSIDE AND PECTOLINARIN FROM *CIRSIUM COLORADENSE*

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**Key Word Index**—*Cirsium coloradense*; Compositae; acacetin-7-*O*-rutinoside; pectolinarin.

I report the identification of the two major flavonoid constituents isolated from the leaves of *Cirsium coloradense* (Rydberg) Cockerell. They are identified as acacetin-7-*O*-rutinoside and pectolinarin (6-methoxy-acacetin-7-*O*-rutinoside). Pectolinarin has been reported from the leaves of eight other species of *Cirsium*.[1] The structures of the flavones were assigned on the basis of $R_f$s, color reactions on paper chromatograms, and UV spectral data[2] (Table 1). The acacetin glycoside determination was made by comparison with published results.[2] The 6-methoxy determination is based on the bathochromic shift in Band I of only 27 nm (as opposed to a shift of 55–60 nm) upon the addition of $AlCl_3$ and $AlCl_3$–HCl. This lower shift is characteristic of flavonoids with a free 5-hydroxy and an adjacent 6-hydroxy or 6-methoxy in the A-ring.[3] Because the Band II maximum of the MeOH spectrum is at 274 nm (as opposed to 286 nm, typical of a free 6-hydroxy[1]), this flavone is considered to be a 5-OH-4′, 6-di-OMe-7-*O*-glycoside.

TABLE 1. CHROMATOGRAPHIC AND SPECTRAL DATA FOR ACACETIN AND PECTOLINARINGENIN 7-*O*-RUTINOSIDES AND THEIR AGLYCONES[2,3]

| Acacetin 7-*O*-rutinoside | Acacetin | Pectolinarin | Pectolinaringenin |
|---|---|---|---|
| MeOH 268, 325 | 269, 330 | 276, 330 | 274, 330 |
| NaOMe 268 decreases 370, | 277, 295, 362 decreases | 296, 380 decreases | 272sh 291 357, decreases |
| $AlCl_3$ 275, 300, 345, 385 | 278, 300, 348, 383 | 277, 300sh, 356 | 277sh 301 357, |
| $AlCl_3$/HCl 275, 300, 345, 385 | 278, 302, 341, 384 | 277, 300sh, 356 | 285sh 301 350, |
| NaOAc 268, 325 | 276sh, 296, 357 | 276, 328 | 275 297sh 367, |
| NaOAc-$H_3BO_3$ 268, 328 | 269, 338 | 275, 331 | 276, 335 |
| | $R_f$s (on Whatman 3MM paper) | | |
| TBA 0·41 | 0·84 | 0·51 | 0·83 |
| HOAc 0·51 | 0·08 | 0·69 | 0·09 |

## EXPERIMENTAL

Voucher specimens are deposited in the Rocky Mountain Herbarium (RM). Leaves were extracted in MeOH, the extract concentrated by evaporation, and the flavonoids isolated using paper chromatography (TBA, 3:1:1 and 15% HOAc). The glycosides were acid hydrolysed (no aglycones were produced using β-glucosidase) and the sugars chromatogrammed using EtOAc–pyridine–$H_2O$ (12:5:4). Sugars were detected by spraying the chromatograms with pthalic acid–analine–95% EtOH (3·75 g:2 ml:198 ml).

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