

Mabry⁶ haben einige UV-Daten und Schmelzpunkte angegeben, die sehr wahrscheinlich von einem Syntheseprodukt stammen. Aus *Goodenia strophidata* haben Middleton und Jefferies⁷ und kürzlich aus *Eupatorium species* Herz und Mitarbeiter⁸ dieselbe Verbindung isoliert. Schmp. 265–267° (Lit. 272–273°) (Umwandlungspunkt 234°) UV: (MeOH) $\lambda_{\max}$ 255, 268 (sch), 357: (NaOAc) $\lambda_{\max}$ 273, 324 (sch), 393; (H₃BO₃) $\lambda_{\max}$ 270, 376; (AlCl₃) $\lambda_{\max}$ 276, 304 (sch), 393, 440; (AlCl₃–HCl) $\lambda_{\max}$ 268, 297, 362, 404; (NaOMe) $\lambda_{\max}$ 273, 321, 408.

IR. Hydroxyl–2500–3450 cm⁻¹; Carbonyl 1645 cm⁻¹. NMR: DMSO-*d*₆ + (CF₃CO₂D), TMS Intern St. H–2' δ = 7,65 ppm (*d*) *J* = 2; H–6' δ = 7,57 ppm (*q*) *J* = 9, *J* = 2; H–5' δ = 7,00 ppm (*d*) *J* = 9; H–8 δ = 6,50 ppm (*d*) *J* = 2; H–6 δ = 6,29 ppm (*d*) *J* = 2; OCH₃– δ = 3,86 ppm (*s*). Acetylierung mit Essigsäureanhydrid und Pyridin liefert ein Tetraacetat Schmp. 175° (Lit. 185°). IR des Acetates: Ester-Carbonyl 1750 cm⁻¹, Flavon-Carbonyl 1645 cm⁻¹. NMR des Acetates (CDCl₃) H–6' –H–2' δ = 7,95 bis 8,12 ppm (*m*); H–5' δ = 7,37 (*d*) *J* = 9; H–8 δ = 7,33 (*d*) *J* = 2; H–6 δ = 6,86 (*d*) *J* = 2; OCH₃ δ = 3,86 (*s*); OAc 5 δ = 2,48 (*s*); OAc–3',4',7 δ = 2,35 (*s*).

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⁶ T. J. MABRY, K. R. MARKHAM und M. B. THOMAS, *The Systematic Identification of Flavonoids*, Springer, New York (1970).

⁷ E. J. MIDDLETON und P. R. JEFFERIES, *Austral. J. Chem.* **21**, 2349 (1968).

⁸ W. HERZ, S. GIBAJA, S. V. BHAT und A. SRINIVASAN, *Phytochem.* **11**, 2625 (1972).

Phytochemistry, 1972, Vol. 11, pp. 3087 to 3088. Pergamon Press. Printed in England.

FLAVONOL-3-GLYCOSIDES IN EIGHT *HYMENOXYS* SPECIES

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Plants and Sources. *Hymenoxys anthemoides* (Juss.) Cass. collected by P. R. Legname and A. R. Cuezso on 23 Dec. 1965, 4 miles from Santa Rosa at the junction of the road to Bella Vista and on 24 Oct. 1966, at 42 km along the road from Santa Rosa to Leales, Department of Leales, Tucuman Province, Argentina (Legname and Cuezso No. 5502 and 5595 on deposit in herbarium of Instituto Miguel Lillo, Tucuman, Argentina).

H. argentea (Gray) K. F. Parker (Barr No. 68-362), 0.5 mile east of Aripine, Navajo County, at a height of 6500 ft, 16 July 1968.

H. bigelovii (Gray) K. F. Parker (Barr No. 68-346) along Rim Road, south east of Showlow, Navajo County, Arizona, at a height of 6500 ft, 15 July 1968. *H. odorata* DC (Barr No. 68-307), in the meadow of J. F. Richards, 1 mile east of Rodea, Hidalgo County, New Mexico. June 1968. *H. quinquesquamata* Rydb., (Barr No. 68-670) in the Huachaca mountains at the end of the Reef road, Cochise County, Arizona, 13 Sept. 1968. *H. richardsonii* (Hook.) Cockerell var. *floribunda* (Gray). K. F. Parker (Barr No. 68-363) 10 miles south east of Springfield Apache County, Arizona, 17 July 1968. *H. rusbyi* (Gray) Cockerell (Barr No. 68-597) 26 miles north of Glove, Gila County, Arizona, at a height of 6100 ft, 5 July 1968. *H. subintegra* Cockerell (Barr No. 68-419) 1 mile west of Deer lake, Kaibab plateau, North rim of Grand Canyon, Arizona, at a height of 9000 ft., 31 July 1968, collections made by R. J. Barr are on deposit in herbarium of Florida State University.

Previous work. Sesquiterpene lactones and lactone glycosides from chloroform extract of *H. anthemoides*,¹ and *H. subintegra*² flavones, sesquiterpene lactones and lactone glycosides from chloroform extract of *H. odorata*,^{1,3} *H. richardsonii* var. *floribunda*¹ and *H. rusbyi*.²

Present work. Quercetin-3- β -glucoside (isoquercitrin), quercetin-3- β -galactoside (hyperoside), quercetin-3- β -D-(O-acetyl) glucopyranoside, quercetin-3-rutinoside (rutin), quercetin, kaempferol-3-glucoside, kaempferol and isorhamnetin-3-galactoside were identified in the methanolic extracts of the aerial portions of the plants by direct comparison with authentic substances, cochromatography (TLC and PC-4 solvents) and hydrolysis.

TABLE 1. SURVEY OF FLAVONOIDS IN EIGHT HYMENOXYS SPECIES

Plant	Flavonoids						
	Q	Q-gl	Q-ga	Q-ru	Q-a-gl	Ir-ga	K
<i>H. anthemoides</i>	+	+	—	—	+	—	+
<i>H. argentea</i>	—	—	—	+	—	—	—
<i>H. bigelovii</i>	—	+	—	—	—	+	—
<i>H. odorata</i>	—	+	—	—	—	—	+
<i>H. quinquesquamata</i>	—	+	—	—	—	—	—
<i>H. richardsonii</i> var. <i>floribunda</i>	+	+	—	—	+	—	+
<i>H. rusbyi</i>	—	—	+	—	—	+	+
<i>H. subintegra</i>	—	+	—	—	+	—	+

Q = quercetin; Q-gl = quercetin-3- β -glucoside; Q-ga = quercetin-3- β -galactoside; Q-a-gl = quercetin-3- β -D-(O-acetyl)glucopyranoside; Q-ru = quercetin-3-rutinoside; Ir-ga = isorhamnetin-3- β -D-galactoside; K = kaempferol; K-gl = kaempferol-3- β -D-glucoside.

It is evident from Table 1 that except for the fact that *H. anthemoides* resembles *H. richardsonii* in its flavonoid contents there is no uniformity in the flavonoid contents of other species. Further it is worth noting that Thomas and Mabry⁴ have isolated from a sister species—*H. scaposa*—scaposin, demethoxysudachitin, hymenoxin, quercetagitrin, patulitrin, patuletin-3-rutinoside and patuletin-3-glucoside, none of these was found in the eight species investigated here.

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