pellotine. A MS of this peak was then obtained using a combined GC–MS instrument (ion source 3·5 kV, electron energy 70 eV and ionization current 60 μA). Column: 3% XE-60 on Gas Chrom Q. 100/120 mesh, 150°. MS data: Compound in *L. diffusa*, major peaks, *m/e* 251 (M^+, 0·5%), 236 (100%), 220 (23%), 206 (30%). Reference *O*-methylpellotine, major peaks, *m/e* 251 (M^+, 0·5%), 236 (100%), 220 (8%), 206 (20%). The MS are in accord with published data [8].

Acknowledgements—The authors thank Sr. Hernando Sánchez-Mejorada for the identification of *Lophophora diffusa*, Dr. Jan Lundström for a sample of *O*-methylpellotine HCl, Dr. Jan-Erik Lindgren for recording the MS, and the Swedish Natural Science Research Council for financial support (2451-9; 2451-10).

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Phytochemistry, 1975, Vol. 14, pp. 1443–1444. Pergamon Press. Printed in England.

FLAVONES FROM PEACOCK AND REGAL ANNE *CHRYSANTHEMUM* FLOWERS

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(*Received September* 1974)

Key Word Index—*Chrysanthemum morifolium*; Compositae; flavones; apigenin 7-*O*-glucoside; acacetin 7-*O*-glucoside; luteolin 7-*O*-glucoside; diosmetin 7-*O*-glucoside.

Plants. Chrysanthemum morifolium Ramat. cv. Regal Anne and Peacock. *Source.* Yoder Bros., Inc., Barberton, OH 44203, U.S.A. *Uses.* Ornamental. *Previous work.* Acacetin 7-rhamnoglucoside from the flowers of *Chrysanthemum sinense* Sab [1].

Present work. Fresh flowers of each cv. were extracted with hot MeOH and the concentrated extract taken up in citrate–phosphate buffer pH 3·0. Flavones were separated into several fractions by column chromatography on polyvinylpyrrolidone (PVP) [2] with 30% aqueous MeOH. Isolation of the individual flavones was by preparative TLC on microcrystalline cellulose (C_6H_6–HOAc–H_2O, 6:7:0·9; *iso*-PrOH–HCOOH–H_2O, 2:5:5; and 20% HOAc) and identification was by co-chromatography with authentic samples, UV spectra and MS fragmentation patterns.

The same four flavones were isolated from each cv. Under UV radiation compound (**1**) was deep purple and the color did not change in ammonia vapor. Spectral data were those of a 4′,7-disubstituted apigenin. The λ_{max} in EtOH were 324 and 268 nm; with NaOEt 365 (decrease in extinction), 286, and 245 (sh) nm; with $AlCl_3$ 382, 338, 300 and 278 nm; and with NaOAc or NaOAc–H_3BO_3 no appreciable change. Controlled acid hydrolysis yielded no intermediate glycoside, and the final products were glucose and an aglycone spectrally and chromatographically indistinguishable from apigenin 4′-methyl ether (acacetin) [3]. The MS fragmentation pattern of the aglycone and an authentic sample of acacetin were identical and showed that the molecular ion was at *m/e* 284. Principal fragments were observed at *m/e* 269, 256, and 241. Compound (**1**) was acacetin 7-*O*-glucoside and was indistinguishable from an authentic sample.

Compound (**2**) was deep purple under UV radiation and the color changed to yellow-green in ammonia vapor. Spectral data were those of a 7-substituted apigenin. The λ_{max} in EtOH were 335 and 268 nm; with NaOEt 386 (increase in extinction) 355 (sh), 295 (sh), and 268 nm; with $AlCl_3$ 383,

345, 298 and 277 nm; and with NaOAc 387, 355, 267, and 256 (sh) nm; and with NaOAc–H_3BO_3 no appreciable change. Controlled acid hydrolysis yielded no intermediate glycoside, and the final products were glucose and an aglycone the same as apigenin. For comparable values see Ref. [3]. Compound (**2**) was indistinguishable from an authentic sample of apigenin 7-*O*-glucoside.

Compound (**3**) was dull brown under UV radiation and the color did not change in ammonia vapor. Spectral data were those of a 4',7-disubstituted luteolin. The λ_{max} in EtOH were 342, 268 and 253 nm; with NaOEt 382 (decrease in extinction), 295 (sh) and 268 nm; with $AlCl_3$ 385, 351, 295 (sh), 276 and 268 (sh) nm; and with NaOAc or NaOAc–H_3BO_3 no appreciable change. Controlled acid hydrolysis yielded no intermediate glycoside, and the final products were glucose and an aglycone spectrally and chromatographically the same as luteolin 4'-methyl ether (diosmetin) [3]. The MS fragmentation pattern of the aglycone and an authentic sample of diosmetin were identical and showed that the molecular ion was at *m/e* 300. Principal fragments were observed at *m/e* 285, 271, 257, and 229. All the above criteria indicated that (**3**) was diosmetin 7-*O*-glucoside.

Compound (**4**) was deep purple under UV radiation and the color changed to yellow in ammonia vapor. Spectral data were those of a 7-substituted luteolin. The λ_{max} in EtOH were 350, 267 (sh) and 255 nm; with NaOEt 393, 295 (sh) and 264 nm; with $AlCl_3$ 404, 365 (sh), 295 (sh), and 274 nm; with NaOAc 411, 365 (sh), 266 (sh), 258 nm; and with NaOAc–H_3BO_3 377 and 260 nm. Controlled acid hydrolysis yielded no intermediate glycoside, and the final products were glucose and an aglycone spectrally and chromatographically the same as luteolin [3]. Compound (**4**) was indistinguishable from an authentic sample of luteolin 7-*O*-glucoside.

Acknowledgements—We express our appreciation to Drs. R. M. Horowitz and T. J. Mabry for samples of diosmetin and acacetin 7-*O*-glucoside, to Dr. J. R. Plimmer for the MS data, and to Ms. P. S. Budin for her competent technical assistance.

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Phytochemistry, 1975, Vol. 14, pp. 1444 1445. Pergamon Press. Printed in England.

LINIFOLIN A AND HELENALIN FROM *HELENIUM AROMATICUM**

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(*Received* 18 *November* 1974)

Key Word Index—*Helenium aromaticum*; Compositae; sesquiterpene lactones; linifolin A, helenalin.

Plant. Helenium aromaticum (Hook) L. H. Bailey [syn. *Cephalophora aromatica* (Hook.) Schrader, *Graemia aromatica* Hook.] *Source.* Garden of Pharmacognosy, Institute of Biology and Pharmacy, Poznań (Specimen 353/73; deposited in the Herbarium of Garden of Pharmacognosy, Institute of Biology and Pharmacy, Poznań) grown from the seeds obtained from the Botanical Garden, University of Uppsala,

* Part 237 "On Terpenes". Part 236 Samek, Z. and Holub, M. *Tetrahedron Letters* (in press).