

SHORT COMMUNICATION

FLAVONOIDS OF THREE *CROTALARIA* SPECIES

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Abstract—The flavonoids of *Crotalaria striata*, *C. paniculata* and *C. anagyroides* have been studied, and apigenin and its glycosides are commonly found.

Plant. Species of *Crotalaria* (Leguminosae—sub-family Lotoideae).

Uses. Medicinal.¹⁻⁴

Previous work. On sister species.⁵⁻⁹

Present Work

Alcoholic extract of the material fractionated with petrol, ether and EtOAc.

C. striata DC. (= *C. mucronata* Desv.)

Leaves. Vitexin (from EtOAc fraction, 0.05% yield, m.p. and mixed m.p., hydrolytic fission with HI in phenol, R_f and co-chromatography) and vitexin-4'-O-xyloside (from the aq. fraction after EtOAc, by the lead salt method) (R_f and co-chromatography, hydrolysis to vitexin and xylose).

C. striata DC

Stem bark. Apigenin (from ether fraction, acetate, m.p. and mixed m.p., R_f and co-chromatography). Vitexin and its 4'-O-xyloside (from EtOAc fraction, confirmed as above).

C. paniculata Willd

Flowers. Quercetin 3-galactoside (from EtOAc fraction, m.p. and mixed m.p., R_f and co-chromatography, acid hydrolysis to quercetin and galactose), vitexin-4'-O-xyloside (from EtOAc fraction, confirmed as under *C. striata* leaves).

¹ R. N. CHOPRA, S. L. NAYAR and I. C. CHOPRA, *Glossary of Indian Medicinal Plants*, p. 81, Council of Scientific & Industrial Research, New Delhi (1956).

² K. M. NADKARNI, *Indian Materia Medica*, Vol. I, p. 391, Popular Book Depot, Bombay (1954).

³ K. R. KIRTIKAR and B. D. BASU, *Indian Medicinal Plants* (edited by L. M. BASU), Vol. I, p. 693, Allahabad (1933).

⁴ J. M. WATT and M. G. BREYER-BRANDWIJK, *The Medicinal and Poisonous Plants of Southern and Eastern Africa*, p. 577, E. & S. Livingstone, London (1962).

⁵ S. SANKARA SUBRAMANIAN and S. NAGARAJAN, *Current Sci.*, India **36**, 364 (1967).

⁶ S. SANKARA SUBRAMANIAN and S. NAGARAJAN, *Planta Med.* **16**, 432 (1968).

⁷ S. SANKARA SUBRAMANIAN and S. NAGARAJAN, *Current Sci.*, India **36**, 403 (1967).

⁸ S. SANKARA SUBRAMANIAN and S. NAGARAJAN, *Indian J. Pharm.* **29**, 311 (1967).

⁹ S. SANKARA SUBRAMANIAN and S. NAGARAJAN, *Current Sci.*, India **38**, 65 (1969).

C. anagyroides H. B. and K.

Stem bark. Apiin (from EtOAc fraction, m.p., R_f and hydrolysis by 10% H_2SO_4 to apigenin, glucose and apiose).

C. juncea L.

Seeds. Apigenin-7-glucuronide and apigenin-7,4'-*O*-di-glucoside (from EtOAc fraction, R_f).

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SHORT COMMUNICATION

CHLOROGENIN AND KAEMPFEROL GLYCOSIDES FROM THE FLOWERS OF *AGAVE AMERICANA*

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Abstract—Chlorogenin was isolated in a yield of 0.5% from the fresh flowers of *Agave americana*. The flavonol glycosides were identified as kaempferol-3-glucoside and kaempferol-3-rutinoside.

Plant. *Agave americana* L.—Amaryllidaceae.

Source. Pondicherry.

Uses. Medicinal.^{1,2}

Previous work. Hecogenin from leaves;^{2,3} work on sister species.⁴

Present work. Examination of flowers.

Fresh flowers extracted with hot ethanol (95%) under reflux, aq. concentrate shaken and layered with an equal volume of benzene and kept in an ice-chest for 2 weeks. The colourless solid separated at the interphase on crystallization thrice from MeOH yielded chlorogenin,⁵ $C_{27}H_{44}O_4$, m.p. 272–274°, $[\alpha]_D^{28} - 51.2^\circ$ (py); diacetyl, m.p. 154–155°, $[\alpha]_D^{28} - 36.5^\circ$; dibenzoyl, m.p. 200–203°, $[\alpha]_D^{28} - 9.8^\circ$. Benzene concentrate yielded a small quantity of the same solid (total yield, 0.5%). No hecogenin could be identified. Ether extract of the aq. alc. concentrate yielded small quantity of kaempferol (R_f and co-chromatography). EtOAc extract yielded two glycosides of kaempferol (separated by preparative PC) identified as kaempferol-3-glucoside and kaempferol-3-rutinoside (m.p., R_f , acid hydrolysis and co-chromatography with authentic samples) (total yield of flavonols, 0.03%).

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¹ R. N. CHOPRA, I. C. CHOPRA, K. L. HANDA and L. D. KAPUR, *Chopra's Indigenous Drugs of India*, p. 577, U. N. Dhur, Calcutta (1958).

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³ H. SINGH and W. PEREIRA, JR., *Indian J. Chem.* **2**, 297 (1964).

⁴ K. PAECH and M. V. TRACEY, *Modern Methods of Plant Analysis*, Vol. III, pp. 191–200, Springer-Verlag, Berlin (1955).

⁵ G. HARRIS, *Dictionary of Organic Compounds*, Vol. III, p. 629, Eyre & Spottiswoode, London (1965).