

CHRY SOPHANOL AND EMODIN FROM CALLUS TISSUE OF RHUBARB (*RHEUM PALMATUM*)*

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Key Word Index— *Rheum palmatum*; Polygonaceae; anthraquinones; callus tissue; chrysophanol; emodin.

Material. The callus tissue of rhubarb, derived from the petiole of *Rheum palmatum* L. in May, 1969, was grown in the dark at 26° on Murashige and Skoog's agar medium (minus glycine) containing IAA (1 ppm), kinetin (0.1 ppm) and subcultured at intervals of 5 weeks growth cycle. The original plant (P₂-53) was supplied by Mr S. Kobayashi, Experiment Station for Medicinal Plant Studies, the University of Tokyo.

Previous work. None on the secondary compounds in the callus tissue of this plant.

Present work. The benzene soluble fraction of MeOH extract of the callus (fr. wt 32.3 g) was

shaken with 5% NaHCO₃, 5% Na₂CO₃ and 5% NaOH to separate into three fractions. The presence of chrysophanol and emodin in Na₂CO₃ soluble and NaOH soluble fractions was confirmed by co-TLC (silica gel G treated with 0.5 N oxalic acid, C₆H₆-AcOEt, 2:1, *R_f* 0.73-chrysophanol, only in NaOH soluble fraction, *R_f* 0.46-emodin). The combined fractions (60 mg) were chromatographed over deactivated silica gel column (treated with 0.5 N oxalic acid) and eluted with C₆H₆ (10 ml fractions). Fractions 2–10, on recrystallization from MeOH, gave chrysophanol as yellow needles (0.3 mg, mp and mmp 193°).

* Part 25 in the series 'Studies on Plant Tissue Cultures'. For Part 24 see Ikuta, A., Syono, K. and Furuya, T. (1974) *Phytochemistry* **13**, 2175.

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SIDERIN FROM *CLEMATIS LIGUSTICIFOLIA**

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Key Word Index— *Clematis ligusticifolia*; Ranunculaceae; siderin; 4,7-dimethoxy-5-methylcoumarin.

Plant. *Clematis ligusticifolia* (Nutt.). **Source.** Collected near Lethbridge, Alberta, Canada in 1966 by A. Johnston. Identified by A. Johnston, Range ecologist, Research Station, Canada Department of Agriculture, Lethbridge, Alberta, Canada. **Uses.** Medicinal [1].

Present work. The concentrated MeOH extract of dried, ground roots (2.6 kg) was separated into soluble and insoluble acetone extracts. The acetone-soluble portion was dissolved in CHCl₃, extracted with 5% HCl and 5% NaOH, then concentrated to give neutral material (12.6 g). Chromatography over silicic acid (CHCl₃-MeOH, 100:1) gave sitosterol (m.p. 136–138°) identified by comparison with an authentic sample (m.m.p. 135–

* Abstracted from the M.Sc. thesis of L. M. Browne, University of Alberta, 1968.

1. Loder, J. W. and Russell, G. B. (1966) *Tetrahedron Letters*, No. 51, 6327.
2. Loder, J. W. and Russell, G. B. (1969) *Aust. J. Chem.* **22**, 1271.