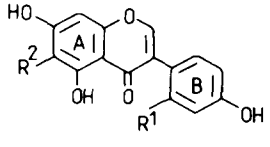
OESTROGENIC ISOFLAVONES IN A *LUPINUS ALBUS* VARIETY DEVELOPED FOR COMMERCIAL USE

I.R. Pantry, M.J. O'Neill and M.F. Roberts, Department of Pharmacognosy, The School of Pharmacy, University of London, 29-39 Brunswick Square, London WC1N 1AX

Lupins are a rich source of protein and the relatively recent introduction of 'sweet' (low-alkaloid containing) varieties of some species has greatly improved the potential value of this crop as animal fodder (Duke 1981). However, lupins also contain a number of fungitoxic isoflavones (Tahara *et al* 1984), some of which possess oestrogenic activity. Such compounds could have adverse effects on reproduction in grazing animals. In order to determine whether isoflavones are present in a sweet variety of *Lupinus albus*, we have studied cv. Vladimir which is currently under investigation for its commercial potential.

We have isolated three isoflavones from 14 day old seedlings. These were initially identified in ethanolic extracts by spraying TLC plates with Fast Blue B salt reagent to detect phenolic compounds. Fungitoxic activity of the isoflavones was detected by spraying a similarly developed TLC plate with a dense spore suspension of *Cladosporium cucumerinum*. Genistein and luteone were separated by column chromatography and a preparative isocratic reverse- phase HPLC system developed during the study. 2'-Hydroxygenistein was purified by TLC. All compounds were characterised by use of UV, MS and PMR. In the latter technique, particular use of the Nuclear Overhauser effect was made in order to establish, unequivocally, the location of the hydroxyls in the B-ring (Asres *et al* 1985). This technique has not been applied previously to these compounds: the assignment of the hydroxylation pattern in the B-ring has always been assumed from a knowledge of biosynthetic pathways.

Genistein is known (Bradbury and White 1951) to induce oestrogenic effects in mice at a dose of 1 mg per mouse. This compound may contribute to the observed oestrogenic activity produced by *Trifolium subterraneum* when ingested by sheep: genistein occurs in this plant at ca. 20 µg/g fresh weight. In our study, the total isoflavone yield from *L. albus* cv. Vladimir was 20.1 µg/g fresh weight which suggests that this sweet variety could produce significant oestrogenic effects in livestock if allowed to mature.



	R^1	R^2	yield µg / g (fresh weight)
genistein	H	H	6.4
luteone	OH	$CH_2CH=C(CH_3)_2$	10.1
2'-hydroxygenistein	OH	H	3.6

We acknowledge partial financial support from the Pharmaceutical Society of Great Britain.

Duke, J.A. (1981) Handbook of Legumes of World Economic Importance, Plenum Press: 132-141

Tahara, S. et al (1984) Phytochem. 23(9): 1889-1900

Asres, K. et al (1985) submitted to Z. Naturforsch.

Bradbury, R.B., White, D.E. (1951) J. Chem. Soc.: 3447-3449