

# Swainsona Extract Increases Gut Motility in the Isolated Rabbit Ileum

P. Hereford-Ashley and I.R. Godwin

Department of Physiology, School of Rural Science, University of New England, Armidale, N.S.W. 2351

*Swainsona* spp. are responsible for many cases of livestock poisoning in Australia. The toxic principle is swainsonine, an indolizidine alkaloid. This chemical is a specific inhibitor of  $\alpha$ -D-mannosidases and consequently leads to the accumulation of abnormal oligosaccharides and vacuolation of tissue cells. These changes are reversible upon cessation of ingestion of the material. In the long term if animals continue to eat the plant in large quantities it may lead to the development of locoism, addiction and neurological impairment.

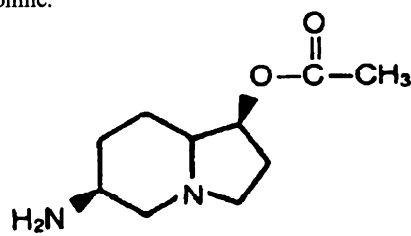
A related alkaloid isolated from *Rhizoctonia leguminicola*, **slaframine**, (see figure 1) has shown great potential as a potent stimulant to salivary flow and rumen turnover rate in cattle (Froetschel et al 1987). It achieves these changes via specific parasympathetic stimulation.

In view of their similar chemical structure we report here preliminary tests of *Swainsona* extract on an isolated rabbit ileum preparation.

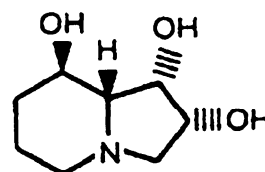
A filtered aqueous extract of *Swainsona formosus* was prepared after homogenizing fresh plant material in Tyrodes solution. This extract showed classical parasympathetic action, with an increase in smooth muscle tonus and increase in amplitude of spontaneous contractions. This effect was blocked by the addition of  $10^{-5}$  M atropine (see fig.2)

These data indicate that swainsonine may become a cheaper alternative to slaframine if its *in vivo* pharmacology is similar to slaframine and its toxicity can be prevented by intermittent withdrawal.

**Figure 1** Chemical structures of slaframine and swainsonine.



**Slaframine**



**Swainsonine**

## References

- Froetschel, M.A., Croom, W.J.Jr., Hagler, W.M.Jr., Tate, L.P.Jr. and Broquist, H.P. (1986) *J.Anim.Sci.* 62: 1404-1409.

**Figure 2** A typical trace of rabbit ileal contractions in response to Swainsona extract.

