The stimulation of β-adrenergic receptors by macusine B

SIR,—Macusine B, an alkaloid isolated by Battersby, Binks, Hodson & Yeowell (1960) from *Strychnos toxifera*, inhibits both α-adrenergic and tryptamine receptors in a number of isolated tissues (Leonard, 1965a). There is also evidence from its action both *in vivo* and *in vitro* that it stimulates β-adrenergic receptors (Leonard, 1965b). An assessment has now been made of its stimulant action on β-adrenergic receptors.

Isolated rabbit auricles were suspended in a 50 ml bath of Ringer Locke solution, at 30° (Burn, 1952). Macusine B increased both the heart rate and the amplitude of contraction of the auricles (Fig. 1), but only in high doses (200 μg/ml bath fluid) compared with an approximately equipotent dose of isoprenaline (0·02 μg/ml). The effects of both macusine B and of isoprenaline were completely blocked by pronethalol. The weak β-stimulating effect of macusine B is further suggested by its effect on the heart rate of mice.

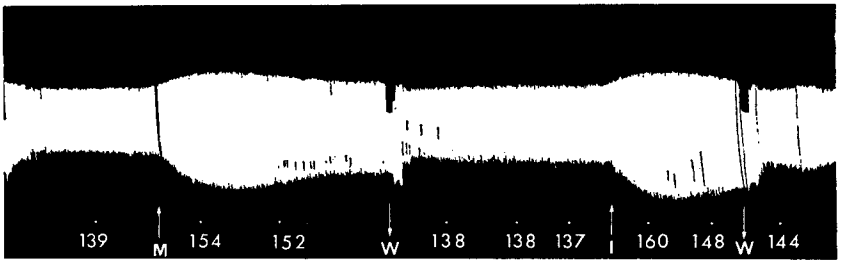

FIG. 1. Effect of macusine B on the rate and amplitude of contraction of the rabbit isolated auricles. Auricles suspended in oxygenated Ringer Locke solution at 30°. At ↑ M, 200 μg/ml macusine B and at ↑ I, 0·02 μg/ml isoprenaline sulphate were added to the bath. The bath was washed out at ↓W. The figures indicate the rate/min.

Ten albino mice (20–30 g) were lightly anaesthetised with anaesthetic ether and the resting heart rate recorded with an electrocardiogram. The animals were then allowed to recover, and 1 hr later were injected with macusine B (10 mg/kg i.p.). Thirty min after injection the mice were again lightly anaesthetised and the heart rate counted. Macusine B, in a dose that is approximately 0·25 LD50 dose caused a 14% increase in the heart rate but this was not significantly different from the control value ($P > 0·1$).

It is evident from these results that macusine B has only weak β-adrenergic stimulant activity; its main action appears to arise from its α-adrenergic and tryptamine blocking activity (Leonard, 1965a).

Acknowledgement. I wish to thank Professor A. R. Battersby for the sample of macusine B.

Pharmacy Department,
The University,
Nottingham.

B. E. LEONARD

July 14, 1966

References

Battersby, A. R., Binks, R., Hodson, H. F. & Yeowell, D. A., (1960). *J. chem. Soc.*, 1848–1854.
Burn, J. H. (1952). *Practical Pharmacology*, Oxford: Blackwell.
Leonard, B. E. (1965a). *J. Pharm. Pharmac.*, **17**, 755–757.
Leonard, B. E. (1965b). *Ibid.*, **17**, 566–576.