Effect of Hersaponin and Acorus oil on Noradrenaline and 5-Hydroxytryptamine Content of Rat Brain

SIR,—The neuro-pharmacological actions of hersaponin, the active principle from *Herpestis monniera*, Linn, have been reported earlier (Malhotra and Das, 1959; Malhotra, Das and Dhalla, 1960). The barbiturate hypnotic potentiating action of the drug was shown to be antagonised by lysergic acid diethylamide (LSD). Dandiya, Cullumbine and Sellers (1959) reported that the volatile oil (acorus oil) from the rhizomes of *Acorus calamus*, Linn, potentiated barbiturate hypnosis and this was antagonised by LSD. Acorus oil (Dhalla, Malhotra and Sastry, 1961) and hersaponin (Dhalla, Sastry and Malhotra, 1961) have both been found to depress rat brain respiration *in vitro*. The depressant effects were enhanced by 5-HT and decreased by LSD. Recent studies from our laboratory showed that the barbiturate hypnotic potentiating action of hersaponin, acorus oil and reserpine is antagonised by dibenzyline while that of chlorpromazine is unaffected (Malhotra, Das and Dhalla, unpublished observations). These investigations indicated that hersaponin and acorus oil might also affect the 5-HT and noradrenaline contents of brain, as does reserpine.

Hersaponin, isolated from *Herpestis monniera* (Sastry, Dhalla and Malhotra, 1959), was suspended in 10 per cent propylene glycol, and acorus oil was suspended in 1 per cent Tween 80. 5-HT and noradrenaline contents of whole brain of adult albino rats were estimated after the intraperitoneal administration of hersaponin, acorus oil, reserpine or chlorpromazine. Control animals were treated with solvents. Noradrenaline was extracted by the method of Vogt (1954) and assayed on rat blood pressure by the method of Crawford and Outschoorn (1951). 5-HT was extracted and assayed on oestrous uterus of rat by the method of Parratt and West (1957).

The results of the investigations (Table I) show that hersaponin and acorus oil deplete the rat brain of its noradrenaline and 5-HT contents, as does reserpine.

TABLE I

EFFECT OF HERSAPONIN, ACORUS OIL, RESERPINE AND CHLORPROMAZINE ON THE NORADRENALINE AND 5-HT CONTENTS OF RAT BRAIN

(Mean ± Standard Errors and Probability (P) from Student's "*t*" test)

Drug and dose	Time interval in hr.	No. of rats	Noradrenaline µg./g.	No. of rats	5-HT µg./g.
Control	—	10	0·320 ± 0·018	10	0·196 ± 0·010
Hersaponin 20 mg./kg.	¼	8	0·115 ± 0·004 (P <0·01)	8	0·130 ± 0·013 (P <0·05)
Acorus oil 100 mg./kg.	1	8	0·145 ± 0·012 (P <0·01)	8	0·156 ± 0·012 (P <0·05)
Reserpine 1 mg./kg.	3	5	0·140 ± 0·009 (P <0·01)	5	0·102 ± 0·003 (P <0·01)
Chlorpromazine 2 mg./kg.	2	6	0·270 ± 0·010 (P >0·05)	6	0·204 ± 0·012 (P >0·05)

Chlorpromazine, had no significant effect. It appears, therefore, that the active constituents of the two Indian indigenous drugs *Herpestis monniera* and *Acorus calamus*, which have been widely used in the Ayurvedic System of medicine for different nervous and mental diseases (Nadkarni, 1954), may prove to have a mechanism of action similar to that of reserpine.

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May 25, 1961.

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