

LETTERS TO THE EDITOR

Detection of Tryptophan Synthesising Enzyme in *Rauwolfia serpentina* Benth

SIR,—The presence of tryptophan synthase, which catalyses the condensation of serine and indole to form tryptophan is mostly demonstrated in microorganisms like neurospora (Tatum, 1944). The observation by Tyler and Schwarting (1954) on the availability of such a system in *Claviceps purpurea*, which forms indole alkaloids, is interesting. During a detailed study of the biosynthesis of indole alkaloids in *Rauwolfia serpentina* plants, tryptophan synthesising enzyme was detected.

Fresh homogenates of roots and leaves were prepared in M/15, phosphate buffer, pH 7.8, and the ratio of homogenate to buffer adjusted to 1:2. The activity of the enzyme was determined by measuring the rate of disappearance of indole and subsequent formation of tryptophan. Samples containing indole, serine, glutathione, pyridoxal phosphate, enzyme extract and the buffer, were incubated for 4 hr. and the unreacted free indole was extracted with toluene and estimated colorimetrically (Yanofsky, 1955). Tryptophan concentrations were measured in the remaining aqueous liquid by the method of Nason, Kaplan and Colowick (1951).

The content of tryptophan formed, corresponded to the quantity of indole disappearing during the reaction (Table I).

TABLE I

THE UTILISATION OF INDOLE AND THE FORMATION OF TRYPTOPHAN IN ROOTS AND LEAVES OF *R. serpentina*. THE FIGURES ARE THE AVERAGES OF FIVE EXPERIMENTS

	Indole added µg.	Indole recovery µg.	Tryptophan formed µg.	Indole disappeared per cent
Leaves	40	14	34	65
..	40	20	26	50
..	40	22	24	45
Root	40	28	16	30
..	40	32	10	20
..	40	28	14	30

Further confirmation of the presence of the enzyme in the plant and the specific utilisation of indole in the synthesis of tryptophan was obtained by the omission of serine, one of the substrates, and the addition of sodium cyanide—an enzyme inhibitor. In the absence of the serine, indole was utilised to the extent of 5 per cent compared with 50 per cent in control experiments. There was practically no change in the indole content in the presence of sodium cyanide. The observations clearly indicate the presence of tryptophan synthase in a higher plant, not hitherto reported in literature.

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