

SHORT COMMUNICATION

THE UPTAKE OF ERGOTHIONEINE FROM THE SOIL INTO THE LATEX OF *HEVEA BRASILIENSIS*

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IN OUR previous communication,¹ it was shown that latex from *Hevea brasiliensis* growing in Ceylon and Malaya contained ergothioneine, whilst latex from *H. brasiliensis* of a similar age growing in a greenhouse attached to these laboratories did not. We have now analysed latex from trees growing under glass at Birmingham and at Kew and have found ergothioneine only in the material from Kew. These further results are consistent with the proposal¹ that *H. brasiliensis* obtains ergothioneine from the soil, since variations in the number and activity of ergothioneine-synthesizing fungi in different soils would be expected.²

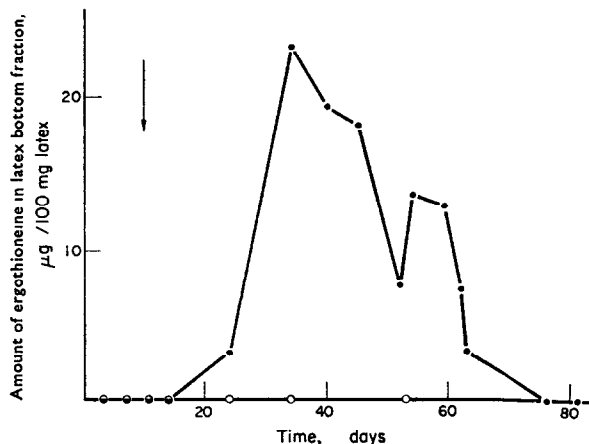


FIG. 1. THE UPTAKE OF ERGOTHIONEINE FROM THE SOIL INTO *H. brasiliensis* LATEX BOTTOM FRACTION; ERGOTHIONEINE WAS FED AT THE TIME INDICATED BY THE ARROW: ●—● ergothioneine fed; ○—○ no ergothioneine fed.

Figure 1 shows that ergothioneine applied to soil in which *H. brasiliensis* seedlings were growing was detectable in the latex bottom fraction 14 days after feeding and reached a maximum at 24 days. Latex serum was analysed on the 35th and 44th day after feeding, but no ergothioneine was detected, confirming our previous finding that ergothioneine is concentrated in the latex bottom fraction. Proof that the new peak which appeared in the elution

¹ C. H. TAN and B. G. AUDLEY, *Phytochem.* 7, 109 (1968).

² D. B. MELVILLE, *Vitamins Hormone* 17, 155 (1959).

diagrams of bottom fraction extracts was due to ergothioneine was provided by the position of the peak, and the paper chromatographic and u.v. absorption characteristics of the eluted material.¹

The results of this experiment strongly suggest that the ergothioneine of *H. brasiliensis* latex arises in the soil. It is also clear that the ergothioneine accumulated eventually disappears, but the mechanism of its removal from the latex is as yet unknown. It seems likely that the compound is contained within the so-called lutoid particles which are the main components of latex bottom fraction.³ Wiersum⁴ has suggested that these particles comprise a polydisperse vacuolar system, and the concentration of ergothioneine by them may simply be an example of the phenomenon of vacuolar uptake and storage of materials observed in plant cells generally. Whether the presence of ergothioneine in *H. brasiliensis* has any physiological significance remains to be decided.

EXPERIMENTAL

For the feeding experiment four seedlings (height about 1·8 m), reared in a greenhouse, were used. These were grown in John Innes Compost in pots and were watered from below. A known weight of latex (50–200 mg from each pair of plants) was collected in ice-cold tris-mannitol buffer, pH 7·2¹ (about 0·1 ml), centrifuged at 600 g for 3 min at room temperature and the sediment (bottom fraction) extracted twice with 0·5 ml of boiling water. The clarified extract was fractionated on a Sephadex G-15 column¹ and the extinctions of the fractions read in a cuvette of 5 cm light path. In this way as little as 5 µg of ergothioneine could be determined. After checking that the latex from each plant contained no ergothioneine, two plants were each watered with 500 ml of neutralized ergothioneine hydrochloride solution (1·064 g/l.) and the other pair used as controls. Latex serum was prepared from white fraction as described previously¹ and boiled to remove protein before analysis.

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³ L. N. S. HOMANS and G. E. VAN GILS, *Proc. 2nd Rubber Technol Conf.* p 292 (1948)

⁴ L. K. WIERSUM, *Vakbl. Biol.* **37**, 17 (1957).