

artefact, and there is no way of disproving this at the moment. However, the Mayer's albumin was the only water-miscible material used in the procedure, and when it was eliminated the sucrose appeared in the extrafollicular spaces, which is where it should become localized according to ideas accepted at present.

There have appeared remarkably few articles on autoradiographic localization of sugars despite the obvious importance of this subject to many experiments. One reason may be the difficulty encountered in obtaining good localization with existing methods. The present technique of mounting without exposure to water or water-containing or water-miscible material at any point in the procedure may help remedy this situation.

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Resin Metabolism in the Sapwood of *Pinus radiata*

THE use of carbon-14 produced in nuclear bomb testing in biological investigations has been discussed in an earlier communication¹. Since 1954 the specific activity of the carbon dioxide in the atmosphere over New Zealand has been increasing as is shown in Fig. 1². We have used this effect to examine the resin metabolism of *Pinus radiata*.

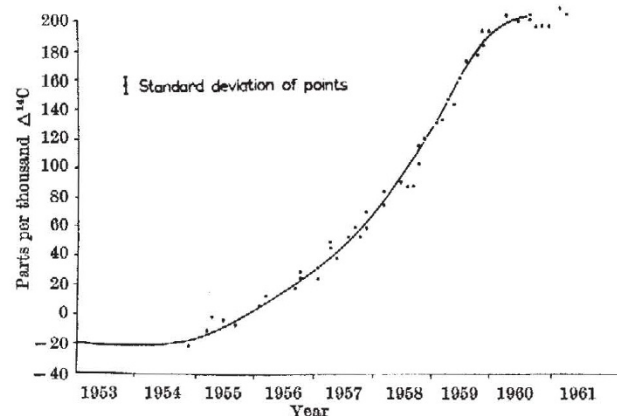


Fig. 1. Specific activity of southern hemisphere atmosphere after Rafter (ref. 1). $\Delta^{14}\text{C}$ expressed as parts per thousand enrichment above 0.95 of National Bureau of Standards' oxalic acid standard and normalized for isotopic fractionation to 0.975 of the P.B.D. Chicago belemnite standard.

Annual rings of a *Pinus radiata* tree felled in January 1960 in the Kaingaroa Forest were ground up and the resin extracted with acetone. From the residue, cellulose was prepared. The acetone-extracted material and the cellulose were converted to carbon dioxide and counted in the Institute of Nuclear Science low-level carbon-14 counter. The carbon-12 : carbon-13 ratio of a portion of each sample was measured so that the results could be corrected for any isotope effect either in the metabolism of the tree or in the chemical manipulations. The results are given in Table 1.

From these results it is clear that: (1) all the resin activity is considerably lower than that of the atmosphere at the time of felling of the tree. Thus the resin in the sapwood of *Pinus radiata* is not in metabolic equilibrium with the metabolism of the tree. (2) The resin has a long

Table 1. PARTS PER THOUSAND $\Delta^{14}\text{C}$ * VALUES FOR CHEMICAL FRACTIONS OF ANNUAL RINGS OF *Pinus radiata*

Annual ring	Cellulose	Acetone-soluble (resin)
1953/54 + 1954/55	-20	+7.3
	$\sigma = 4.0$	$\sigma = 4.9$
1955/56 + 1956/57	-14.8	+13.1
	$\sigma = 2.8$	$\sigma = 2.3$
1957/58 + 1958/59	+53.5	+50.0
	$\sigma = 3.4$	$\sigma = 3.4$

* $\Delta^{14}\text{C}$ expressed as parts per thousand enrichment above 0.95 of National Bureau of Standards oxalic acid standard and normalized for isotopic fractionation to 0.975 of P.B.D. Chicago belemnite standard. σ = standard deviation of counting.

metabolic half-life, at least of the order of many years. (3) Since the resin in the three rings measured has significantly different specific activities, it follows that any lateral circulation through the laterally and vertically interconnected resin canals is very slow, with mixing times at least of the order of many years.

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BIOLOGY

Special Tubules for Sperm Storage in Female Lizards

SPECIAL sperm storing glands occur at the base of the infundibulum of the oviduct of colubrid¹ and viperid² snakes, and are probably characteristic of all snakes³. No structure of similar function has been described in other reptiles. I have detected the presence of sperm in small tubular outgrowths of the vagina of the green anole, *Anolis carolinensis*.

Female anoles were collected from the vicinity of New Orleans. Forty-six were maintained in captivity for various periods; 15 were killed within three days after capture (Table 1). Oviduct sections were stained with Mallory's azan or hæmatoxylin and eosin.

Table 1. SEASONAL FREQUENCY OF SPERM IN TUBULES

Dates	With sperm	Without sperm
Captivity period		
July 5-Sept. 20	11	0
Aug. 13-Oct. 8	6	1
Aug. 27-Nov. 24	9	0
Sept. 20-Jan. 10	3	1
Oct. 10-Jan. 14	6	1
Nov. 3-Jan. 7	7	1
Fresh killed		
Jan. 14	4	0
March 13	2	0
April 3	2	0
April 22	7	0
Totals	57	4

Lizard oviducts consist of an anterior infundibulum, a middle uterus and a posterior vagina⁴. In *Anolis*, the infundibulum is thin-walled and lined by simple ciliated and non-ciliated columnar epithelium. The mucosa is thrown into low, more or less circular folds. The shallow ciliated troughs and pits between the folds bear only a superficial resemblance to the seminal receptacles of snakes. The uterus is the largest part of the oviduct and contains coiled tubular shell glands. The vagina is divided into a thin, anterior vaginal tube and a thick, posterior vaginal pouch. The mucosa of the anterior two-thirds of the vaginal tube is arranged in longitudinal folds; caudally, the folds bifurcate and run irregularly. The epithelium of the vaginal tube consists of simple, columnar, ciliated cells interspersed with non-ciliated cells.