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Influence of light on labelling of wheat stem lignins using [U¹⁴C] phenylalanine or [O¹⁴CH₃] sinapic acid

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In order to investigate the fate of lignin during cell wall ruminal degradation, we studied the synthesis of uniformly and specifically labelled ¹⁴C lignin in the dark or in the light.

Batches of 5 wheat-straw upper internodes (flowery stage) were labelled for 90 h uptake period by the cut stem procedure with 2 MBq of either [U-¹⁴C] phenylalanine (phe*) or [O-¹⁴CH₃] sinapic acid (sin*), in the dark or in the light (photoperiods of 12 h). After drying at 50 °C, the lower half of the internode was ground. Cell walls were prepared, deproteinised (pronase), treated by NaOH to remove esterified phenolic acids and oxidised by alkaline nitrobenzene; the aldehydes were analysed by HPLC and the radioactivity of the fractions measured by liquid scintillation (Agosin *et al*, 1982).

With phe* as a precursor, vanillin (V) and syringaldehyde (S) were both labelled in similar proportions (table I), with a slight increasing effect of darkness conditions. With sin*, the incor-

poration was higher in the dark. S was considerably more labelled than V, especially in the dark, but the differences were less than those observed by Terashima *et al* (1979). These authors worked with *Eucalyptus*, left 72 h in the dark before incorporation. The effect of light may be important in membrane permeability for guaiacyl precursors (Grand; quoted by Terashima *et al*, 1979).

In conclusion, ¹⁴C labelling of wheat straw lignin with phe* or with sin* gives, especially in the dark, lignins either labelled on the 2 main monomers or more specifically on the S units. They are useful for studying the fate of lignin during cell wall degradation.

Agosin E, Odier E, Gaudillère M, Monties B (1982) CR Journ Intern Étude Groupe Polyphenols. *Bull Liaison* 11, 187-195

Terashima N, Okada M, Tomimura Y (1979) *Mokizai Gakkaishi* 25, 422-426

Table I. Labelling of lignin nuclei after phe* or sin* incorporation.

Treatment	Phe* Light	Phe* Dark	Sin* Light	Sin* Dark
Vanillin KBq/mmol	49.58	69.56	68.82	94.72
Syringaldehyde KBq/mmol	51.8	58.46	247.9	398.49
S/V	1.04	0.84	3.6	4.2