in the developing ground substance. This explains why 'varices' can be found deep in the uncalcified dentine.

It seems highly likely that the mechanism briefly described here is not restricted to dentine, but is a regular pattern of the different subcutaneous free receptors, at least in the mucosa and in the skin.

A more detailed report of this work will be published elsewhere.

D. Hattyasy

Dental and Oral Department,
University Medical School,
Szeged.

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BIOLOGY

Promotion of Cucumber Hypocotyl Growth by Two New Gibberellins

Wittwer and Bukovac[1] and Lockhart and Deal[2] have recently shown that gibberellin A_4, though less active than gibberellin A_1 or gibberellic acid in most bioassay systems[1,3,4], is far more active than A_1 or gibberellic acid in promoting the growth of cucumber stems. We have found that two recently discovered gibberellins, A_7 and A_9, both produced by *Gibberella fujikuroi*[5,6], also show specifically high activity in promotion of cucumber hypocotyl growth.

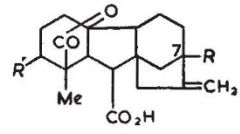
Cucumber seeds were germinated on moist filter paper at 25° C. in darkness. After 48 hr. the seed-coat was removed from germinated seeds and they were transplanted in dishes of 1 per cent water agar. The gibberellin was applied in 2-μl. drops of ethanol to the cotyledons. After 2 (Table 1) or 3 (Table 2) days growth at 25° C. in diffuse white light, the lengths of the hypocotyls were measured. The results of experiments with two varieties of cucumber, in which gibberellins A_4 and A_7 and gibberellic acid were compared, are presented in Table 1. It will be seen that both A_4 and A_7 are considerably more effective than gibberellic acid in promoting hypocotyl growth. We have found that gibberellin A_7 is of the same order of activity as gibberellic acid in promotion of lettuce hypocotyl growth, but less active than gibberellic acid in promotion of pea stem extension.

Gibberellin A_9 is much less active than gibberellic acid in promotion of pea stem or lettuce hypocotyl growth; with both plants a dose of 10 μgm. A_9 is required to give an effect comparable to that of 0·1 μgm. gibberellic acid. Nevertheless, A_9 is much more active than gibberellic acid in promotion of cucumber hypocotyl growth (Table 2). In other experiments we have confirmed the observation of Wittwer and Bukovac[1] that gibberellin A_1 is of the same order of activity as gibberellic acid on cucumbers.

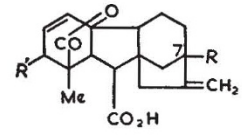
Table 2. Hypocotyl Length (mm.) of Cucumber Seedlings (Means of 30 Replicates ± *S.E.*)

Dose (μgm./plant)	Long Green ridge cucumber		Perfection ridge cucumber	
	Gibberellic acid	A_9	Gibberellic acid	A_9
0·2	27·2 ± 0·9	41·3 ± 1·1	33·4 ± 0·9	42·1 ± 1·0
1·0	30·5 ± 0·8	50·9 ± 1·2	37·2 ± 1·0	51·1 ± 1·3
5·0	40·8 ± 1·0	55·8 ± 1·4	41·0 ± 1·6	53·9 ± 1·5
Untreated controls	25·3 ± 0·7		26·0 ± 0·8	

It is perhaps significant that gibberellins A_4 (I; $R = H$, $R' = OH$), A_7 (II; $R = H$, $R' = OH$) and A_9 (I; $R = R' = H$) have one structural feature in common that distinguishes them from A_1 (I; $R = R' = OH$) and gibberellic acid (II; $R = R' = OH$), namely, the absence of a hydroxyl group at position 7.



(I)



(II)

We hope shortly to compare these gibberellins in other bioassay systems where A_4 has been shown to have specific activity[7]. We are indebted to Dr. B. E. Cross for samples of gibberellins A_4, A_7 and A_9.

P. W. Brian
H. G. Hemming

Imperial Chemical Industries, Ltd.,
Akers Research Laboratories,
Welwyn, Hertfordshire.

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Effect of High-Temperature Pre-Treatment on the Germination of Oil Palm Seed

It has been known for more than forty years that a high temperature is essential for the germination of oil palm seed[1], and on a commercial scale seed is germinated in sand beds exposed to the Sun, in fermentation pits or in artificially heated germinators.

Table 1. Hypocotyl Length (mm.) of Cucumber Seedlings (Means of 20 Replicates ± *S.E.*)

Dose (μgm./plant)	Long Green ridge cucumber			Perfection ridge cucumber		
	Gibberellic acid	A_4	A_7	Gibberellic acid	A_4	A_7
0·2	15·7 ± 0·6	32·0 ± 1·4	33·3 ± 1·5	15·4 ± 0·8	28·7 ± 1·2	30·4 ± 1·5
1·0	17·5 ± 1·0	32·5 ± 1·5	32·3 ± 1·7	19·5 ± 1·4	30·1 ± 1·3	35·0 ± 1·5
5·0	21·2 ± 1·1	34·7 ± 1·9	29·9 ± 1·3	18·2 ± 1·5	28·5 ± 1·4	34·5 ± 1·6
Untreated controls	16·3 ± 1·0			12·4 ± 0·7		