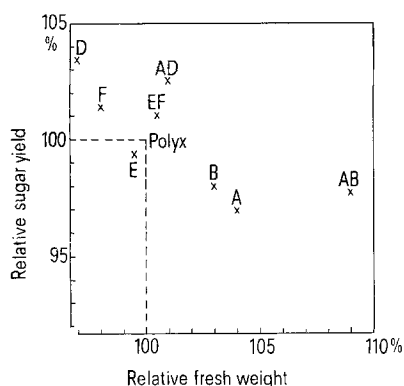


Peroxidase as Biochemical Measure of Fresh Weight and Sugar Yield in Sugar-Beet

The correlation between mean fresh weight in full-grown sugar-beet tubers and sugar yield is well known by practitioners in the sugar-beet industry: the bigger are the tubers, the lower the sugar yield (per kg), in general. Selection and hybridization studies tend naturally to increase both fresh weight and sugar yield at the same time.

Preliminary experiments¹ on tubers indicated a positive correlation between sugar richness and peroxidase. The present experiments were undertaken to question the predictive value of peroxidase activity in seedlings of new hybrids for establishing the degree of superiority of yield in full-grown tubers.

Peroxidase and protein were measured by methods already described^{1,2}, comparatively in extracts from 7-day-old seedlings (culture in sand, 25°C, dark) and from corresponding field full-grown tubers.



Distribution of parents and sugar-beet hybrids on the basis of their relative fresh weight and sugar yield compared to those of the Polyx variety taken as reference.

Peroxidase activity (measured by galacol) expressed in equivalents μg HRP (horseradish peroxidase Fluka) per unit protein, in tubers and seedlings roots of the sugar-beet populations A, B, D, E, F, AB, AD and EF (see Figure)

	A	B	D	E	F	AB	AD	EF
Tubers	0.83	0.78				0.59		
Seedlings	2.02 ^a	2.96				1.80		
	1.81 ^a	1.92				1.60		
	2.26 ^a		4.21				3.16	
	2.19 ^a		3.69				2.54	
				3.16	3.05			2.85
				4.21	4.50			2.95

^a Mean values from different seed samples, studied at different times of a year.

Characteristics of parents and hybrids used here are indicated in the Figure. Comparisons of peroxidase activity in seedlings and tubers are given in the Table.

Let us consider the hybrids AB and AD obtained from the parents A, B and D. As can be seen in the Figure, the hybrid AB is bigger than the parents A and B, the size of the hybrid AD is between those of A and D. This situation is well reflected in peroxidase activities: peroxidase activity in AB is lower than that in A and B; it is intermediate between A and D in AD. Results obtained with E, F and EF are in agreement with the preceding ones. Important is the fact, as already mentioned¹, that this peroxidase index for tuber growth can be measured early in young seedlings, as well as in full-grown tubers (example A, B, AB). So this correlation between peroxidase and capacity of growth is automatically associated with sugar yield in sugar-beet and can serve as biochemical measure in selection studies.

The relationship between peroxidase and capacity of growth is well-known since the first experiments of VAN OVERBEEK³ in maize dwarfism. It can be interpreted in terms of auxin available for growth through its control by the auxin-oxidase activity of peroxidase⁴. The link between sugar and peroxidase is not yet understood. But knowing that sugar is involved in ethylene biosynthesis⁵ and that this gaseous hormone controls peroxidase⁵, it would not be surprising to find a correlation between sugar yield peroxidase and ethylene biosynthesis in sugar-beet too. Experiments are being undertaken to clarify further the sugar yield capacity in this material⁶.

Résumé. L'activité peroxydasique est toujours nettement plus élevée dans les tubercules de populations de Betterave caractérisés par un poids frais moyen peu élevé et par une forte teneur en sucre. Cette corrélation est décelable dans les plantules de quelques jours: elle peut donc servir de critère biochimique de sélection.

TH. GASPARD and M. BOUCHET

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14 March 1973.

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⁵ C. T. PHAN, *L'éthylène: métabolisme et activité métabolique*, *Monogr. Physiol. Vég.* no. 8 (Masson et Cie., Paris 1971), p. 130.

⁶ Work supported by the S.A. Société européenne de Semences, Tienen and the Fonds de la Recherche Fondamentale Collective (grant No. 998).

The Influence of Histone Fraction F¹ and ATP on the Amplitude of Contractions of the Isolated Right Ventricle of Rats

In our previous work¹ we established that addition of different fractions of histones to the perfusion fluid produces changes in the amplitude of contractions of the isolated rat's left auricles. The most effective among them was fraction F₁ (lysine very rich histones), which most

powerfully inhibited the amplitude of contractions. As ATP is indispensable for muscle contraction as the direct

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