

ticulate fraction was sharply increased by all the calcium and the 10^{-4} M strontium growth treatments (Table 1, column 4). The ATPase activity of the 10^{-2} M strontium treatment was similar to that of the control, even though root growth definitely was impeded. It is re-emphasized that the results are expressed per unit of protein, thus indicating preferential formation of the enzyme. When the divalent cations calcium and strontium were added to the enzyme reaction mixture, however, two opposite effects were always noted as indicated previously. This observation is quite vital as it provides evidence that the properties of the enzyme are not altered by calcium and strontium levels of the root growth medium. Thus the actual quantity of the enzyme must be changed by their presence in the growth medium.

The results of an experiment in which the strontium concentration of the growth medium was varied over a wider range are presented in Fig. 1. The values for specific activity of the ATPase are those with calcium added to the reaction mixture and the weights are for fresh roots of ten representative plants from each treatment. At 10^{-5} M strontium the specific ATPase activity was greatly enhanced, thus indicating preferential enzyme formation. In contrast to the previous experiment, no increase in specific activity of the ATPase was obtained at 10^{-4} M strontium. Our inability to define precisely the effective strontium concentration was probably due to failure in maintaining constant strontium levels in the dilute solutions throughout the growth period.

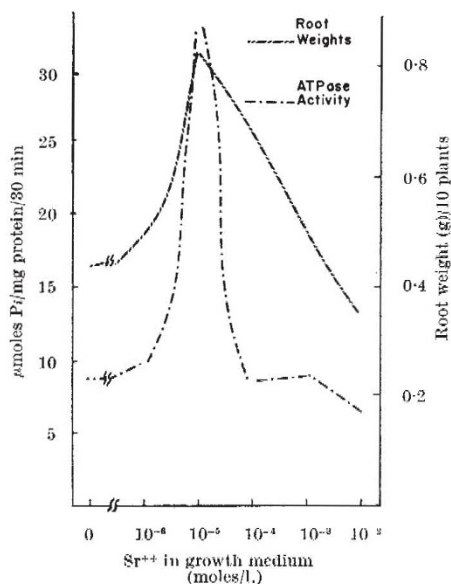


Fig. 1. Effects of altering strontium concentration of growth medium on wheat root growth and ATPase activity (particulate fraction). Strontium added as the chloride salt. ATPase assay conditions presented in the text

Considering the increased root growth associated with the higher calcium levels and limited strontium concentrations, the increase in ATPase level per plant is even more striking than that expressed on a unit protein basis. Since root growth was promoted by some strontium concentrations which did not result in increased ATPase activity, it would seem that the effect of strontium on overall protein synthesis was not identical with its effects on ATPase formation. A calcium- or strontium-activated enzyme system from guinea-pig liver which incorporates a variety of amines into proteins has been reported⁶, but no attempt was made to assess the enzymatic properties of the synthesized protein.

The present results provide evidence for a rather striking and unique relationship between two possible

roles of calcium and strontium in wheat roots. In one enzyme system (ATPase formation) calcium and strontium, the latter within a limited concentration range, behave in a like manner; whereas their effects on the action (ATP hydrolysis) of the very enzyme the formation of which they promote are directly opposite.

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PSYCHOLOGY

Biology and Schizophrenia

Huxley, Mayr, Osmond and Hoffer¹ have recently discussed transmission of what they consider the schizophrenic genotype. They have advanced the explanation of a simple, single-locus, Mendelian basis for what they regard as 'schizophrenia'. Moran², more recently, has combined such a hypothesis with the observations of socio-economic differences in incidence of schizophrenic diagnosis and concluded a socio-economic class-related genetic polymorphism. None of these authors, however, discussed the inconsistent observations regarding distributions of psychiatric diagnoses by different diagnosticians. The studies of Mehlman³, as well as those of other writers⁴⁻⁸, have supported doubts regarding the objectivity of recent systems of psychiatric classification and their reliability for the construction of simple, general biological concepts. Psychiatric taxonomy is essentially a symptom-oriented classification scheme, which groups patients according to symptoms rather than according to the disorders underlying the symptoms^{9,10}. A simple hypothesis regarding the aetiology of 'schizophrenia', which is based on particular groups of diagnostic data, may partially reflect the concepts of the particular diagnosticians. The inconsistencies in diagnostic distributions and the biological irrelevance of the diagnostic systems may indicate that 'schizophrenia' represents a heterogeneity of disorder constellations rather than a single, universally- and reliably-diagnosed entity. A simple biological theory designed to explain the aetiology of such a category, or class differences in incidence, may be somewhat premature in this context.

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