Table 2. INCREASE IN SUSCEPTIBILITY OF CUCUMBER SEEDLINGS FOR *C. cucumerinum* CAUSED BY SPRAYING WITH INDOLEACETIC ACID AS DEMONSTRATED BY COMPARING DISEASE INDICES AT DIFFERENT TIMES AFTER INOCULATION

Concentration of indoleacetic acid (M)	Days after inoculation 4	5	6
0·001	2·9	3·6	4·0
0·0002	2·7	3·3	4·0
0·00004	2·3	3·4	3·7
0·000008	2·1	3·4	3·6
Water	1·9	2·8	3·4

and their susceptibility to *C. cucumerinum*. Thus it may be considered to support the hypothesis that the chemotherapeutic action of phenylserine is mediated through its influence on IAA oxidase activity. The activity of the enzyme *in vitro* was not influenced by adding phenylserine. This means that the increase in activity in treated plants must be effected in an indirect way. Elema[4] found that gibberellic acid in peas inhibits formation of *p*-coumaric acid, a co-factor for enzymatic IAA oxidation: addition of the compound to extracts of plants treated with gibberellic acid restored IAA oxidase activity.

It is tempting to explain the effect of phenylserine by assuming increased production of *p*-coumaric acid or other compounds acting as co-factors for IAA oxidase in treated plants.

Only preliminary experiments have so far been carried out on the mechanism of action of other chemotherapeutically active amino-acids. It seems probable that other mechanisms than interference with IAA oxidase activity may also be involved.

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SOIL SCIENCE

Seleniferous Soils in Parts of England and Wales

GEOCHEMICAL reconnaissance by stream sediment sampling of 3,000 square miles in the Midlands, North Wales and South-west England disclosed extensive areas characterized by abnormally high molybdenum contents of 5–60 p.p.m. compared with normal background of < 2 p.p.m. The technique used was similar to that applied in Eire[1], and in view of the association of selenium and molybdenum in that country, a selection of the British samples was also analysed for selenium. The results showed selenium to be present in stream sediments in each of the anomalous molybdenum areas, with maximum values ranging from 3·8 to 9·0 p.p.m. selenium compared with the normal background of < 0·2 p.p.m. (Table 1).

Following up the stream sediment indications, preliminary soil samples have been collected from selected anomalous catchment areas. Sample sites were chosen on low-lying poorly drained organic soils, which Irish experience[1,4] has shown to be favourable for the accumulation of selenium and molybdenum. The analyses show that the stream sediment values are related to soils that contain moderately anomalous concentrations of these two elements rising to 7·0 p.p.m. selenium and 45 p.p.m. molybdenum (Table 2).

Table 1. RANGE AND MEAN CONTENT OF SELENIUM AND MOLYBDENUM IN STREAM SEDIMENT

Area	No. of samples	Se (p.p.m.)	Mo (p.p.m.)
North Staffordshire and Derbyshire	22	0·2–9·0 2·8	5–40 19
Caernarvon	16	< 0·2–4·0 1·3	1–25 13
Devon	23	0·2–3·8 1·9	5–10 6
Normal background		< 0·2	< 2

Data refer to minus 80-mesh fraction; selenium was determined colorimetrically (ref. 2) and molybdenum spectrographically (ref. 3).

Table 2. RANGE AND MEAN CONTENT OF SELENIUM AND MOLYBDENUM IN POORLY DRAINED SOILS IN ANOMALOUS CATCHMENT AREAS

Area	No. of samples	Sample depth (in.)	Se (p.p.m.)	Mo (p.p.m.)
North Staffordshire and Derbyshire	8	12	1·5–7·0 4·0	8–45 20
Caernarvon	4	0–6	1·7–5·0 3·0	5–20 10
Devon	4	12	0·2–4·0 1·5	10–20 13
Normal background			< 0·2	< 5

Data refer to minus 80-mesh fraction.

Table 3. SELENIUM AND MOLYBDENUM CONTENT OF SELECTED ROCKS FROM THE ANOMALOUS AREAS

Area	Rock-type	Se (p.p.m.)	Mo (p.p.m.)
North Staffordshire and Derbyshire	Lower Carboniferous		
	Marine shales	2–24	10–30
	Sandstone	2	15
	Limestone	0·2–1·0	< 2
Caernarvon	Ordovician		
	Dark grey slates	0·7	4
	Black pyritic slates—upper bed	4·5–6·5	9–60
	Tuff	1·3	3
	Black pyritic slates—lower bed	0·2–1·8	13–17
Devon	Culm Measures		
	Grey-black marine shales	< 0·2–3·5	< 2–15
	Pyritic shales	2·5–6·0	15–30

The principal bedrock source of the selenium and molybdenum seems to be certain marine shale facies of the Lower Carboniferous in both Staffordshire and Devon, and of the Ordovician in North Wales (Table 2).

Herbage studies have not yet been completed, as much of the work was carried out in the late autumn. Analysis of several samples of mixed grasses from the anomalous regions indicates both selenium and molybdenum contents to be well above those considered normal, and more detailed investigations will be undertaken during the present growing season.

Hypocuprosis is recognized in cattle grazing pasture in part of the molybdenum anomalous region in North Staffordshire, but has not been reported from the Devon and Caernarvon areas. Two suspected cases of chronic selenosis have been reported from Derbyshire, but not from the specific area described in this communication[5]. No animal selenium studies have been made in Devon or North Wales. Nevertheless, the geochemical data indicate the possibility of animal disorders, probably at the sub-clinical level, associated with both selenium and molybdenum in all three areas examined.

More detailed studies are being undertaken, but the preliminary results reported here are of immediate interest in that they provide the first evidence of the existence of seleniferous soils in Britain and lend support to the view that geochemical drainage surveys have potential value in detecting and delineating suspect areas where trace element imbalances may constitute an agricultural problem.

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