Table 1. VALUE EXPRESSED AS PERCENTAGES OF THE RESPECTIVE LEAVES OF AQUATIC PLANTS

(1) Absolute stomatal No.			
Leaf No.	Upper	Lower	Ratio upper/lower
1	—	248	—
2	341	346	99
3	387	544	71
4	285	426	67
5	353	403	87
(2) No. of stomata per square mm leaf area			
1	—	148	—
2	138	145	95
3	99	141	70
4	99	120	82
5	106	115	92

in the formation of stomata to the lower leaf surface is a feature associated with xeromorphy. No significant change is observed on the upper leaf surface so far as stomatal distribution per unit area is concerned.

Reduced leaf lamina is a feature of aquatic plants, and in the species reported here the xeromorphic plants of the same aquatic species had four times the leaf area. Though leaf area was increased four times during xeromorphy, stomatal distribution per unit area was not changed on the upper leaf surface. However, there was a small but consistent increase on the lower leaf surface of the upper leaves, the increase being 41–48 per cent with respect to the same leaves of the aquatic plant.

Upper leaves, farther removed from water supply and exposed to high light intensity, are supposed to be more xeromorphic than the lower leaves of the same plant, and the results obtained in the present investigation suggest that xeromorphy when exhibited by an aquatic plant results in: (a) an increase in the absolute stomatal number; (b) increased stomatal distribution per unit area on the lower surfaces of leaves.

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Occurrence of Indole Compounds containing Phosphorus in Etiolated Pea Seedlings

In the course of paper chromatographic identification of compounds containing phosphorus-32 in different parts of plants the presence of phosphorus compounds with an indole skeleton seemed probable. To prove this, 10-day-old etiolated pea seedlings were kept for 24 h in the dark, in Knop's solution containing phosphorus-32 as KH_2PO_4 (the activity was 5 $\mu\text{C./ml.}$), and an alcoholic extract was chromatographed; on the start points of the one- and two-dimensional chromatograms an extract corresponding to 36 g fresh material was dropped. Developing was carried out first in isopropanol/ammonia/water, 10:1:1, and secondly in butanol/acetic acid/water, 4:1:5 solvent. The chromatograms were sprayed with Salkowski and Ehrlich reagent and exposed on X-ray film for 8 days. On the chromatograms prepared from the extract of epicotyls, five (Fig. 1), and on those prepared from the extract of roots, six, indole-positive spots appeared (Fig. 2): in both cases two of them proved to be radioactive.

In the case of the epicotyl, one of the two radioactive spots was found to correspond to the location and colour reaction of tryptophan, while in the case of the root to those of indolyl-3-acetic acid (IAA). The second radioactive spot gave in both cases a brick-red colour reaction with Ehrlich reagent.

Fig. 1. Radiogram of compounds containing phosphorus-32 soluble in alcohol in the epicotyl of the etiolated pea. T, Tryptophan; X, unknown indole compound

Fig. 2. Radiogram of compounds containing phosphorus-32 soluble in alcohol in the root of the pea. IAA, Indolyl-3-acetic acid; Y, unknown indole compound

Investigations are now being carried out to elucidate the structure and physiological importance of these compounds.

It may be assumed that the compounds involved are partly intermediary products of the biogenesis of IAA and the indole skeleton respectively^{1,2} and, on the other hand, one of them is a compound of IAA formed with phosphoric acid playing a part in the growth regulator system in the plants. Our results, that an IAA derivative containing phosphorus is present in growing plants, is in accordance with the assumption of Rhodes and Ashworth³ whereby the primary effect of IAA is based on the formation of energy-rich phosphate bonds.

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