Table 1. Mean Length (cm.) of First Internode of Seedlings grown in Darkness for 13 Days including the Period of Soaking

	Mean length (cm.) of first internode	
	A	*B*
Seeds matured in darkness	16·4 (0·837)	—
Seeds matured in light	14·16 (0·623)	13·13 (0·235)
Seeds exposed to 2 hr. light at 24 hr. after the beginning of soaking	—	10·47 (0·251)

Column *A* from the present experiment, column *B* from previous experiments with commercially grown seeds. Figures in brackets are standard errors of the means.

vives the normal long period of inactivity in stored seeds and that the first internode of etiolated seedlings is always partially suppressed by light. It may well be that the higher figure of our controls in the present experiment reflects a reaction to the lower light-intensity in which these seeds were matured as compared with the commercially grown seeds. We hope to verify these inferences by further experiment.

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[1] Lane, G. R., and Butler, R. D., *Nature*, **181**, 1080 (1958).
[2] Gregory, F. G., and Purvis, O. N., *Ann. Bot.*, N.S., **2**, 237 (1938).

Differential Reaction of Saprophytic and Parasitic Soil-inhabiting Fungi to Indoleacetic Acid

Indoleacetic acid was shown to be a product of fungus metabolism, when Thimann[1] in 1935 demonstrated that this was the growth-promoting substance (for higher plants) produced by cultures of *Rhizopus suinus*. Later, attempts to reproduce in fungi the growth responses to indoleacetic acid found in higher plants were not successful[2], and interest in this field has been limited. The importance of indoleacetic acid in fungus metabolism has, however, been emphasized by several recent reports, particularly of studies of host–parasite relationships[3–6].

In the course of experiments on the effects of indoleacetic acid on two saprophytic and two plant parasitic soil-inhabiting fungi, growth of the latter was found to be much more readily inhibited than that of the former. *Ophiobolus graminis* Sacc., which causes the well-known 'take-all' disease of wheat and other Gramineae, and *Fomes annosus* Fries, which is a common cause of root and heart rot of conifers, were the two parasites studied. The saprophytes were the two soil fungi *Trichoderma viride* Pers. ex Fries, and *Trichocladium asperum* Harz.

Indoleacetic acid at various concentrations was incorporated in a synthetic liquid medium at *p*H 5·5. The medium was dispensed in 25-ml. aliquots in 200-ml. Erlenmeyer flasks. A mycelium homogenate in 0·25 *M* sodium chloride was used for inoculating the flasks and growth was measured by determining the weight of dried mycelium which developed. Typical data are given in Table 1.

Neither *T. viride* nor *T. asperum* was significantly inhibited by concentrations of indoleacetic acid up to 100×10^{-5} *M*, while *O. graminis* and *F. annosus* were significantly inhibited at concentrations of 10 and 1×10^{-5} *M* respectively and were completely inhibited at higher concentrations. A number of unidentified saprophytic soil fungi behaved similarly to *T. viride* and *T. asperum* in that the higher concentrations of indoleacetic acid did not significantly reduce growth.

Table 1. Effect of Indoleacetic Acid (IAA) on Growth of Four Fungi

IAA × 10^{-5} *M*	Dry mycelium (mgm.)			
	T. viride	*T. asperum*	*O. graminis*	*F. annosus*
0	180·9	183·7	258·4	84·6
1·0	—	180·0	224·0	46·6
10·0	—	185·5	136·5	0
50·0	169·8	203·8	0	0
100·0	188·1	183·4	0	0
L.S.D. at 1 per cent	—	—	50·4	29·1

These results may have significance for the parasitic or saprophytic development of these fungi. An extension of these findings will be published elsewhere.

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[1] Thimann, K. V., *J. Biol. Chem.*, **109**, 279 (1935).
[2] Leonian, L. H., and Lilly, V. G., *Amer. J. Bot.*, **24**, 135 (1937).
[3] Gentile, A. C., and Klein, R. M., *Physiol. Plantarum*, **8**, 291 (1955).
[4] Pilet, P. E., *Phytopath. Z.*, **31**, 162 (1957).
[5] Shaw, M., and Hawkins, A. R., *Can. J. Bot.*, **36**, 1 (1958).
[6] Wolf, F. T., *Proc. U.S. Nat. Acad. Sci.*, **38**, 106 (1952).

Formation of Purple Pigment in *Spirogyra pratensis* Cultures

Recently, investigation of the purple vacuolar pigment of *Zygogonium ericetorum* Kütz.[1] has disclosed that it is formed by an association of ferric ions with a gallo-tannin. Similar algal pigments reported as anthocyanin-like[2] or phycoporphyrin[3] by previous investigators are probably closely related or identical to the iron-tannin of *Zygogonium*.

Most of the algal species which produce purple cell sap are found in bogs or swamps where iron is more likely to be available in rather high concentration. In addition to *Zygogonium*, several other members of the Zygnemataceae produce tannin, and tannin production by *Spirogyra* has been studied[4]. Thus it is possible that other species, not reported to form purple pigment in Nature, might form pigment under appropriate cultural conditions.

In the course of studies of *Spirogyra pratensis* Transeau, one of us (A. A.) observed that, in Waris medium containing iron sequestrene, sub-cultures of the alga in which conjugation was occurring produced purple filaments. Similar sub-cultures in soil-water remained pale green. Although extensive tests were not conducted, the distinctive responses to ammonia and to hydrochloric acid[1] indicated that the pigment which developed in the sub-cultures in Waris medium was similar to that of *Zygogonium ericetorum*.

Afterwards, vegetative filaments of *Spirogyra pratensis* were transferred into flasks of soil-water and of Waris medium. Transfers were made also into small quantitites of soil-water and of Waris medium in watch glasses enclosed within deep Petri dishes. The latter were for the purpose of encouraging conjugation so that we might compare pigment production by sexual and vegetative material. The