ther studies. As is noted in a preceding paragraph, the action of red light is reversible by subsequent irradiation of seeds with far red light. The effect of gibberellin has not been reversed by a period of exposure to far red light that is sufficient to reverse fully the effect of red light. However, since gibberellin that has entered the seeds cannot be removed, the lack of reversal of the gibberellin effect by far red light cannot be considered definitive.

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6. This work was supported in part by research grant RG-3939 from the National Institutes of Health, U.S. Public Health Service (principal investigators, A. Lang and S. G. Wildman). A description of the details of these experiments and the results of further work now in progress is in preparation.
7. Part of the results reported here were presented at the annual meeting of the American Society of Plant Physiologists, Storrs, Conn., Aug. 1956; abstract in *Plant Physiol.* 31, Suppl., 37 (1956).
8. Seed lot A was kindly supplied by Carlos O. Miller of the department of botany, University of Wisconsin, Madison; seed lot B was obtained commercially from Ferry Morse Seed Co.
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Survey of Fungi and Actinomycetes for Compounds Possessing Gibberellinlike Activity

Culture filtrates of the fungus *Gibberella fujikuroi* contain the plant growth-promoting compounds gibberellins A and B (*1*) and gibberellic acid (*2*). Recently, it has been shown that extracts of higher plants contain gibberellinlike compounds capable of stimulating growth in plants (*3*). This report describes an attempt to demonstrate plant growth-promoting activity similar to that of the gibberellins in the culture filtrates of various fungi and actinomycetes. Approximately 1000 fungus and 500 actinomycete culture filtrates were tested for the presence of these compounds.

The methods used to obtain culture filtrates of the various microorganisms were described in an earlier paper (*4*). In brief, the fungi were cultured in 500-ml erlenmeyer flasks containing 100 ml of corn steep-cerelose medium (Staley's corn steep liquor, 40.0 g; cerelose, 40.0 g; $CaCO_3$, 3.5 g; $NaNO_3$, 3.0 g; K_2HPO_4, 0.5 g; $MgSO_4$, 0.25 g; and deionized water, 1000 ml). Following inoculation, the flasks were placed on a reciprocating shaker (99 to 100 cy/min with 3-inch strokes) at 28°C for 7 days. The mycelial growth in each flask was removed by filtering through Whatman No. 1 filter paper and discarded. One drop of Tween 80 was added to 100 ml (approximate) of culture filtrate, which was adjusted to *p*H 5.0. The culture filtrates were tested without dilution or concentration.

The methods used to obtain the actinomycete culture filtrates were similar to those described in the preceding paragraph. The shake-flask medium (*p*H 7.0) was made up as follows: bacto-peptone, 5.0 g; glucose, 10.0 g; molasses (Brer Rabbit Green Label), 20 ml; $FeSO_4 \cdot 7H_2O$, 0.01 g; and distilled water, 1000 ml. The cultures were incubated on a reciprocating shaker (114 cy/min with 2-inch strokes) for 5 days at 30°C. The culture filtrates were treated as described for fungi and frozen until they were needed.

Corn seedlings (the single cross WF9 × 38-11) were grown in soil in 6-inch pots (six plants per pot). When the seedlings were 6 to 8 cm in height, they were treated by filling the whorls with the culture filtrates on each of two alternate days. The treated plants were allowed to grow for 10 to 12 days, when their heights were measured. Water and the uninoculated culture medium (without carbon source) served as the controls. Twelve to 18 plants were used for each treatment.

By use of the methods described, it was readily demonstrated that the heights of plants that were treated with the culture filtrate of *Gibberella fujikuroi* were 50 to 75 percent greater than those of the controls. Although some 1500 culture filtrates from other sources were used in treating corn plants, in no case was growth stimulation observed. The majority of the culture filtrates tested were obtained from unidentified fungi and actinomycetes that were obtained from soil by routine plating-out procedures. However, 258 filtrates were obtained from organisms which were identified as to genus or species. Table 1 summarizes briefly the major groups of organisms that were tested and the number of genera and species included in each group (*5*).

The number of organisms tested in these studies is admittedly only a small fraction of the total number of identified microorganisms. Furthermore, they were grown on only one medium and tested at only one concentration. In spite of these limitations, it appears that the production of the gibberellins by fungi and actinomycetes is not widespread (*6*).

Table 1. Summary of identified fungi and actinomycetes tested for growth stimulation in corn.

Major groups included in experiments	No. of genera tested	No. of species tested
Schizomycetes		
Actinomycetales	2	7
Phycomycetes		
Peronosporales	2	7
Mucorales	16	36
Entomophthorales	1	1
Ascomycetes		
Endomycetales	5	8
Eurotiales	9	31
Sphaeriales	7	11
Hypocreales	2	2
Pezizales	3	3
Basidiomycetes		
Ustilaginales	1	1
Agaricales	3	3
Fungi Imperfecti		
Sphaeropsidales	3	3
Melanconiales	1	1
Moniliales	42	141
Mycelia-Sterilia	3	3

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Occurrence of Iron, Copper, Calcium, and Magnesium in Tobacco Mosaic Virus

Cooper and Loring reported the finding of small amounts of acid-soluble materials when ultracentrifugally purified tobacco mosaic virus was treated with cold trichloroacetic acid (*1*). Examination of a concentrate of this fraction by paper chromatography (70 percent *tert*-butyl alcohol, 0.8*N* HCl) showed that