

LETTERS TO THE EDITOR

[Brief letters to the Editor that make specific scientific reference to papers published previously in the BIOPHYSICAL JOURNAL are invited. Receipt of such letters will not be acknowledged but those containing pertinent scientific comments and scientific criticisms will be published.]

Dear Sir:

Three years ago, Govindjee, Rabinowitch and Thomas (1) reported an inhibition effect on photosynthesis in *Chlorella pyrenoidosa* and *Porphyridium cruentum* (but not in *Anacystis nidulans*) by "extreme red" $>720\text{ m}\mu$ light. From the action spectrum of this phenomenon, they suggested the existence of an unknown pigment absorbing in this region of the spectrum. Later, Govindjee, Cederstrand, and Rabinowitch (2) reported weak absorption bands in the 720 to 800 $\text{m}\mu$ region in *Chlorella* and *Porphyridium* and a much stronger absorption band at 750 to 760 $\text{m}\mu$ in *Anacystis nidulans* by the use of an integrating spectrophotometer. The existence of the absorption band in *Anacystis* was confirmed by Gassner (3). However, using non-integrating devices, the weaker bands in *Chlorella* and *Porphyridium* could not be confirmed by several authors (3-5), including ourselves. A possible contribution to the spectrum due to the increased absorption by water caused by the increased light path in the integrating sphere was checked.

Fig. 1 (top curve) shows the absorption spectrum of a suspension of *Chlorella*

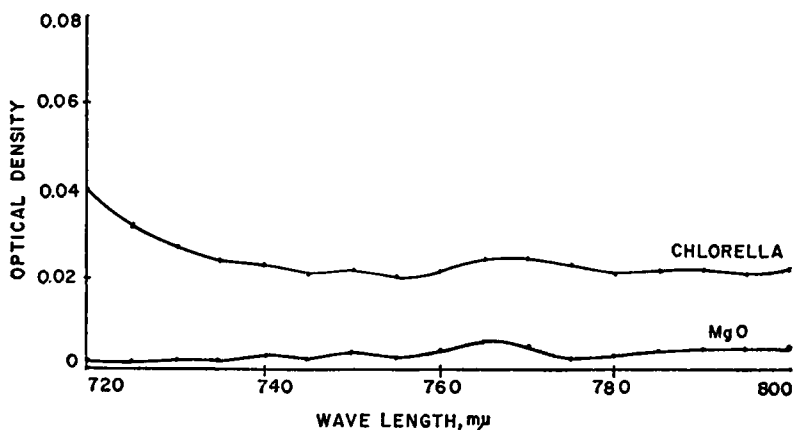


FIGURE 1 Absorption spectrum of a suspension of *Chlorella* (top curve) and that of magnesia (bottom curve) measured with an integrating sphere spectrophotometer.

pyrenoidosa measured with an integrating sphere spectrophotometer. Several weak far red absorption bands are seen. Similar results were obtained in *Porphyridium cruentum*. The bottom curve (Fig. 1) is for a water suspension of magnesia measured with the same spectrophotometer. Several absorption bands appear also in the water-magnesia absorption spectrum. These weak bands located around 740, 750, and 770 $\text{m}\mu$ in the H_2O - MgO sample, match reasonably well in position and relative intensity

with the weak bands observed in *Chlorella*. Thus, these bands in *Chlorella* and *Porphyridium* are artifacts as far as the absorption spectrum of the cell pigments is concerned. However, the absorption band at 750 m μ (P750N) in *Anacystis* has been confirmed to be due to a real pigment.

On the basis of the findings presented here and on the basis of the effect of light on respiration (6, 7), we suggest that a reevaluation of the inhibition effect (1) should be made.

GOVINDJEE
CARL CEDERSTRAND
Department of Botany
University of Illinois
Urbana, Illinois

We thank Dr. W. L. Butler for his valuable suggestion which initiated the above mentioned experiment.

This work was supported by grant G19437 from the National Science Foundation.

Received for publication, June 28, 1963.

REFERENCES

1. GOVINDJEE, RABINOWITCH, E., and THOMAS, J. B., *Biophysic. J.*, 1960, **1**, 91.
2. GOVINDJEE, CEDERSTRAND, C., and RABINOWICH, E., *Science*, 1961, **134**, 391.
3. GASSNER, E., *Plant Physiol.*, 1962, **37**, 637.
4. ALLEN, M. B., BENDIX, S. A., and MURCHIO, J. C., *Arch. Mikrobiol.*, 1962, **42**, 36.
5. SAUER, K., and CALVIN, M., *Biochim. et Biophysica Acta*, 1962, **64**, 324.
6. HOCH, G., OWENS, O., and KOK, B., *Arch. Biochem. and Biophysics*, 1963, **101**, 171.
7. GOVINDJEE, OWENS, O., and HOCH, G., *Biochim. et Biophysica Acta*, 1963, **75**, 281.