1953


Donald Dudley Clarke PhD

_Fordham University_, clarke@fordham.edu

Friedrich F. Nord

_Fordham University_

Follow this and additional works at: [https://fordham.bepress.com/chem_facultypubs](https://fordham.bepress.com/chem_facultypubs)

Part of the [Biochemistry Commons](https://fordham.bepress.com/chem_facultypubs)

**Recommended Citation**


This Article is brought to you for free and open access by the Chemistry at DigitalResearch@Fordham. It has been accepted for inclusion in Chemistry Faculty Publications by an authorized administrator of DigitalResearch@Fordham. For more information, please contact considine@fordham.edu.
Radicinin: A New Pigment from *Stemphylium radicinum*

The occurrence and pathological effects of *Stemphylium radicinum* have been reported by Snyder (1) who also observed that this organism secretes a yellow pigment which crystallizes in the medium under certain conditions. Previous communications from this laboratory have shown that mold pigments, depending on their structure, are capable of influencing certain enzymatic reactions, particularly the rate of dehydrogenations and the mechanism of carbohydrate → fat conversion (2-5). Attempts are now being made to elucidate the structure of this new pigment with a view to correlating its constitution with its action on enzymatic systems.

The organism was grown on potato-dextrose medium at 28°C. in the dark, and the pigment was obtained from the medium by continuous ether extraction approximately 6 weeks after inoculation. The light-yellow crystals melt at 220°C. with decomposition and possess the empirical formula $C_{12}H_{12}O_5$ according to the following microanalyses:

**Anal.** Calcd. for $C_{12}H_{12}O_5$: C, 61.01; H, 5.12; O, 33.87; 2CH$_3$(C), 12.7. Found: C, 60.95; H, 5.38; O, 33.78; OCH$_3$, 0.0; 2CH$_3$(C), 11.9.

Preliminary x-ray data show $a_0 = 6.59$ Å, $b_0 = 8.07$ Å, $c_0 = 10.78$ Å, $\alpha = \beta = \gamma = 90^\circ$, and corroborate the above molecular formula. The space group $P2_12_12$ agrees with the fact that radicinin is optically active, $[\alpha]_D = -175.7^\circ$ (ethanol). The ultraviolet absorption curve has maxima at 340-42 μm ($E_{1%}^m = 2550$) and 270 μm ($E_{1%}^m = 850$). This intense absorption band at 340 μm is very unusual for carbonyl compounds. There are infrared absorption bands at 2.90 μm (–OH), 5.66 μm ($>C=O$), and 6.02 μm ($>C=O$). The pigment is insoluble in dilute acids and sodium bicarbonate but soluble in alkali to give a red solution which slowly absorbs oxygen from the atmosphere. It reduces Fehling's solution and Tollens' reagent and forms a diacetate and a mono-2,4-dinitrophenylhydrazone. From degradation studies and other available data the probable structure seems to be best represented by the formula:

\[
\begin{align*}
O & \quad \text{C} \equiv \text{O} \\
\text{C} & \quad \text{H} \\
\text{OCH}_3 & \quad \text{C} \quad \text{CH}_3
\end{align*}
\]

Our interest was also directed to an understanding of its possible functions, and it was found that at a concentration of approximately $10^{-5} M$ this pigment appreciably increased the rate of dehydrogenation of isopropyl alcohol when incorporated in the medium of growing *Fusarium lini* Bolley (FIB). Contrary to the observations with the pigments solanione (4) and lycopersin (5), radicinin did not influence the growth of FIB on Raulin-Thom medium.

**Acknowledgments**

We wish to thank Dr. W. C. Snyder of the University of California for having furnished us with cultures of *Stemphylium radicinum* and Dr. Ray Pepinsky of

1 Snyder, W. C., private communication.
the Pennsylvania State College for having carried out the x-ray measurements on radicinin. This work is being continued under the auspices of the Office of Naval Research and was supported by the Cottrell Fund of the Research Corporation.

References


Department of Organic Chemistry and Enzymology, Fordham University, New York 58, New York
Received June 8, 1953

D. D. Clarke
F. F. Nord

*Communication No. 278.*