

THE PATH OF CARBON IN PHOTOSYNTHESIS, XI

THE ROLE OF GLYCOLIC ACID*

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INTRODUCTION

The participation of glycolic acid in plant metabolism has been considered in the past, but its relationship to the intermediates of carbon dioxide reduction has been obscure.

Kolesnikov (10) reported accumulation of glyoxylic acid in Chlorella during illumination. Anderson (1), Kolesnikov (11) and Clagett, Tolbert and Burris (9,12) studied the non-photosynthetic metabolism of glycolic acid by plant tissues. The presence of glycolic acid among the early photosynthetic intermediates has been observed by Benson and Calvin (4) and by Burris, Wilson and Stutz (6).

The first stable product of carbon dioxide assimilation in photosynthesis has been shown to be carboxyl-labeled phosphoglyceric acid (5,7). Experiments were then designed to force the accumulation of the C₂ precursor of the α and β carbon atoms of this compound by illuminating plants in the absence of carbon dioxide (Benson and Calvin (4)). These conditions resulted in the accumulation of large amounts of glycolic acid and glycine.

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