Transformations of Carotenoids in Washed Suspensions of *Rhodopseudomonas gelatinosa*

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The cells of *Rhps. gelatinosa* (NCIB 8290) grown under anaerobic conditions in light contain Y [1], OH-Y [2], spirilloxanthin and neurosporene [1] as the major carotenoid components. With a certain degree of aeration the accumulation of the three first carotenoids was completely suppressed, and the cells (designated aerobic cells) synthesized spheroidenone [1], OH-R [2] and a new carotenoid P 518 [2]. Strong aeration reduced the total carotenoid synthesis to a very low level.

For the experiments the cells of *Rhps. gelatinosa* were harvested at the late exponential growth phase, washed once in 0.05 M phosphate buffer pH 7.25, and resuspended in the same buffer. When such suspensions were incubated in the light no net synthesis of carotenoids occurred, but several types of transformations of the preformed carotenoids took place, depending upon the conditions. Kinetic studies of these transformations, based on quantitative analysis, appear to support the scheme of biosynthesis outlined below:

The results may be summarized as follows:

Under anaerobic conditions a transformation of the carotenoids of anaerobically grown cells took place according to the path from neurosporene and Y to spirilloxanthin, representing a mode of biosynthesis of spirilloxanthin different from the pathway established to occur in *Rhodospirillum rubrum* [3,4].

In suspensions of aerobic cells spheroidenone and OH-R were converted to P 518 under anaerobic as well as aerobic conditions.

Upon the introduction of air to suspensions of anaerobically grown cells three different transformations were dominating (those indicated by horizontal arrows), although, the transformations mentioned above occurred simultaneously to a certain extent. From the structure of the carotenoids involved [2] it can be assumed that the access to oxygen caused the introduction of a conjugated keto group into Y, OH-Y and spirilloxanthin to form the carotenoids typical of aerobic cells.

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