

## NOTES

### OXIDATION OF BUTYRIC ACID BY STREPTOCOCCI

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A number of cultures of the *Streptococcus mitis* group were found to oxidize butyric acid under aerobic conditions with the accumulation of hydrogen peroxide. Methylene blue would not serve as a hydrogen acceptor for this butyric acid oxidase system under the conditions tested.

The quantity of peroxide produced by these organisms, when grown in a medium containing butyrate, in some cases compared closely to that produced by pneumococci from meat infusion. In cell suspensions of these streptococci, under highly aerobic conditions, as much as 0.01 M peroxide accumulated from 0.011 M butyrate within one hour at 25 C, pH 7.2. Of all the strains tested, essentially the same qualitative results were obtained with cell suspensions and with growing cultures in a butyrate medium.

Among the 39 *Streptococcus mitis* cultures, freshly isolated from the throats of 18 persons, a relationship was noted between the ability to oxidize butyrate and other physiological characters. For example, of the 28 which failed to hydrolyze arginine, 24 oxidized butyrate; of the 11 arginine-positive strains, only 2 oxidized butyrate. This is in accord with a previously noted relationship between the ability to hydrolyze arginine and certain other physiological reactions (Sherman, Niven, and Smiley: *J. Bact.*, **45**, 249) that indicates that the *Streptococcus mitis* group may consist of more than one species.

A number of representative cultures of all of the well-known serological groups and species of streptococci were tested for the ability to oxidize butyrate, in growing culture and in cell suspension. Aside from *Streptococcus mitis*, no culture was found which possessed this property with the exception of members of the Lancefield group F and the "minute" variety of group G. All of the 5 strains of group F and 8 strains of group G, "minute" variety, definitely oxidized butyrate, but the degree of peroxide accumulation by these cultures was less than that of the *Streptococcus mitis* strains. The "nonminute" group G cultures (10 strains) were unable to attack this substance. None of the 11 pneumococcus cultures tested, representing as many serological types, were able to oxidize butyrate.

#### SUMMARY

Butyric acid is oxidized by streptococci of group F, the "minute" variety of group G, and by many strains of *Streptococcus mitis*. Other species of streptococci and the pneumococci do not appear to have this property.