NOTES

A NOTE ON THE TAXONOMY OF PROTEUS HYDROPHILUS[1]

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Two recent reports (Kulp and Borden, 1942; Guthrie and Hitchner, 1943) have shown that the organism known as *Proteus hydrophilus* is polarly flagellated. Hence this species must be removed from the *Enterobacteriaceae* and placed in the *Pseudomonadaceae*.

Kulp and Borden have also confirmed the finding of previous workers that *P. hydrophilus* ferments carbohydrates with vigorous gas production. This is surprising in view of the extreme rarity of true fermentative ability (*sensu* Pasteur) in the *Pseudomonadaceae*; in fact, the only previous well-established example is the alcoholic fermentation which was shown by Kluyver and Hoppenbrouwers (1931) to be characteristic of *Pseudomonas lindneri*. Hence a more detailed study of the action of *P. hydrophilus* on sugars seemed desirable. An examination of several strains obtained through the kindness of Drs. Kulp and Hitchner has revealed that *P. hydrophilus* carries out a typical butylene-glycol fermentation substantially identical with that of *Aerobacter aerogenes*.

The outstanding fermentative properties of *P. hydrophilus* thus clearly call for a generic separation from other polarly flagellated rods. The appropriate genus, *Aeromonas*, has already been proposed by Kluyver and van Niel (1936) for Beijerinck's (1900) polarly flagellated *Aerobacter liquefaciens*. Although authentic cultures are not available for comparison, it is highly probable that *Aerobacter liquefaciens* is identical with *P. hydrophilus*. Indeed, an extensive synonymy appears to have grown up around *P. hydrophilus*. Guthrie and Hitchner have suggested its identity with *Pseudomonas punctata*, originally described by Zimmermann (1890); it is also indistinguishable culturally and biochemically from *Pseudomonas fermentans* (von Wolzogen Kühr, 1932). Since these organisms were isolated from water and not tested for pathogenicity, it is readily understandable that their relationships to so vigorous a disease-producer as *P. hydrophilus* should have been overlooked. The correct name for *Proteus hydrophilus* is thus *Aeromonas hydrophila*, although if its suggested synonymy with *Pseudomonas punctata* is proved, the latter specific name will have priority.

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ON THE USE OF HYDROLYZED WHEAT MASH FOR THE ENRICHMENT OF CLOSTRIDIUM ACETOBUTYLICUM[1]

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Rubbo *et al.* (1941) suggested a wheat-mash medium for the selective cultivation of *Clostridium acetobutylicum*. Most other anaerobes and the sporing aerobes failed to grow on the medium when anaerobic conditions were provided. The constant need for new strains of this organism for the biological production of acetone and butyl alcohol on industrial scale suggested immediately a possible use of the medium as a selective enrichment medium.

Following exactly the technique of Rubbo *et al.*, with the exception of the use of American grains, media were prepared from the following: wheat, cracked wheat, yellow corn and white corn. These media were tested for their ability to support the growth of authentic strains of *Clostridium acetobutylicum*, *C. roseum*, *C. felsineum*, and three butyric-acid-producing clostridia. *C. roseum* and *C. felsineum* were included because of their close affinity to *C. acetobutylicum* in physiological reactions. The results were not encouraging. All types of media either failed to support growth or did so only when the inoculum was relatively large—0.2 to 0.5 ml. of an active culture. Usually, if the medium supported growth of *C. acetobutylicum*, other cultures, including butyrics, also developed. In view of the negative results several different batches of the media were tested and these were prepared by different individuals to eliminate, if possible, personal factors in the technique. These all failed to be selective for *C. acetobutylicum*. The media were tested by seeding plates and/or deep columns in tubes, or both. Yeast-water glucose agar, included as a control, gave consistently positive cultures with smaller inocula than those which were positive with the hydrolyzed mash media. The pH determinations were made with a Beckman electrode. All plates were incubated in an oat jar (McClung,

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