AGARBACTERIUM ALGINICUM: THE APPROPRIATE TAXONOMIC DESIGNATION FOR ALGINOMonas ALGINICA

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The property of decomposing alginic acid is shared by members of the genus Alginomonas of the Pseudomonadales and the genera Algino-
bacter and Agar bacterium of the Eubacteriales. Type of flagellation is one of the major criteria used in differentiating these orders. As a conse-
quence Bergey's Manual (Breed, Murray, and Smith, Bergey's Manual of Determinative Bacte-
riology, 7th ed., Williams & Wilkins Co., 1957) points out that some of the described species of the genus Alginomonas may be placed incorrectly

denskaps-Akad., Oslo. I. Mat. Naturv. Kl., No. 11, 9, 1945). Determination of flagellar position in our earlier study was made with cells incubated longer than is now advised by E. Leifson (Atlas of Bacterial Flagellation, Academic Press, Inc., New York, 1960) and without considering that lateral flagella have been observed on young cells of bacteria in one genus thought to include only typically polar flagellates (Leifson and Hugh, J. Bacteriol., 65, 263, 1953).

In the present, more critical study, two methods of preparation for electron microscope observations were used. The first consisted of culturing the organism on a nutrient agar slant for 24 hr at room temperature, suspending the cells in distilled water, placing the suspension on copper-supported collodion membranes, and shadowing with platinum-palladium alloy. In the second, cells harvested from 1-, 3-, and 7-day cultures incubated at room temperature were used to inoculate plates of nutrient agar supporting collodion membranes. After an incubation period of 4 hr at room temperature blocks of agar containing the collodion-supported microcultures were cut from the plates, the membrane floated

Figure 1. Alginomonas alginica, collodion supported microculture prepared from 1-day culture. Scale marker = 1 μ.

Figure 2. A. alginica, collodion supported microculture prepared from 3-day culture. Scale marker = 1 μ.

Figure 3. A. alginica, direct electron microscope preparation from 1-day culture. Scale marker = 1 μ.

in this genus since the type of flagellation has not been adequately determined for all species. Therefore, a more detailed study of the flagella-
tion of Alginomonas alginica seemed justified.

The culture used in this study was isolated by Eller and Payne (J. Bacteriol., 80, 193, 1960) who described the bacterium as identical to Bacte-
rium alginicium described by Waksman, Carey, and Allen (J. Bacteriol., 28, 213, 1934) and later designated Alginomonas alginica by Kåss, Lid, and Molland (Avhandl. Norske Vi-

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on distilled water, taken up on a copper screen, and shadowed with platinum-palladium alloy. This technique diminishes the quality of the micrographs, but permits observation of the cells without possibly destructive manipulation.

As seen in figure 1, the organism is peritrichous when a 1-day culture is used in preparing the microculture. When a 3-day culture is used, the organism remains peritrichous, but the number of flagella diminishes (figure 2). When a 7-day culture is used, the flagella diminish in number and the organisms appear to be without flagella or as polarly monotrichous cells. The bacteria also appear nonflagellated or monotrichous, probably owing to flagellar breakage, when a 1-day culture is used for making a direct preparation for electron microscope examination (figure 3).

Since A. alginica has been shown here to be peritrichous, it is no longer possible to retain this species in the Pseudomonadales. Two genera of the Eubacterales, Agarbac terium (family Achromobacteriaceae), and Alginobacter (family Enterobacteriaceae), include organisms hydrolyzing alginic acid. The bacterium originally described by Waksman, Carey, and Allen, and further characterized by Eller and Payne, has characteristics of the Achromobacteriaceae. The species of the genus Agarbac terium are described in Bergey's Manual as attacking agar or alginates. Consequently, A. alginica should be placed in the genus Agarbac terium since it hydrolyzes alginates, although it is not known to hydrolyze agar. However, this is a labile property which other members of the genus Agarbac terium are known to lose upon continued laboratory culture. It is suggested that Agarbac terium alginicum (Waksman et al.) Adams, is the appropriate name of Alginomonas alginica (Waksman et al.) Kass et al.

ACETYL L-ISOLEUCINE AND ACETYL L-LEUCINE AS EXTRACELLULAR PRODUCTS OF MYCOBACTERIUM RANAE

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Acidic products of Mycobacterium ranae have been investigated in this laboratory by subjecting extracts of acidified culture filtrates to fractionation by countercurrent distribution. Succinic acid, fumaric acid, acetic acid, and DL-5-carboxymethylhydantoin were isolated in this way as crystalline products from M. ranae cultured in a defined medium containing asparagine, glycerol, and traces of citrate as the only organic constituents (Fowler et al., J. Biol. Chem., 235, 1386, 1960). Many partially purified products were incidentally obtained, and one of these, after further purification, yielded crystalline material, mp 148 to 151 C, which contained nitrogen and gave a strong color with ninhydrin after either acid or alkaline hydrolysis. Infrared data (figure 1) and elementary analyses were consistent with an acetylated 6-carbon amino acid (calculated for C_{6}H_{15}O_{4}N: C, 55.47; H, 8.73; N, 8.09. Found: C, 55.82; H, 8.77; N, 8.34). Acid hydrolysis of the material yielded a volatile aliphatic acid and an α-amino acid. The volatile product was identified as acetic acid by paper chromatography and by preparation of its p-bromophenacyl ester, mp 84 to 85 C. The amino acid moiety was shown by paper chromatography to be either leucine or isoleucine and by microbiological assay with Lactobacillus arabinosus to consist of 86 per cent L-isoleucine together with 14 per cent L-leucine.

A mixture of synthetic acetyl L-isoleucine (mp 155 to 156 C) and acetyl L-leucine (mp 183 to 184 C) in these proportions melted at the same temperature (148 to 151 C) as the isolated product.

The occurrence of acetyl L-isoleucine and acetyl L-leucine in mycobacterial culture filtrates is of interest primarily because acetylated amino acids have only rarely been encountered in natural materials, although the possible physiological