Deoxyribonucleic Acid Base Composition of *Desulfotomaculum nigrificans*

GRADY F. SAUNDERS AND L. LEON CAMPBELL

Department of Microbiology, University of Illinois, Urbana, Illinois

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The sporeforming, dissimilatory sulfate-reducing bacteria have been reclassified by L. L. Campbell and J. R. Postgate (Bacteriol. Rev. 29:359, 1965) and placed in a new genus: *Desulfotomaculum*. The thermophilic sulfate-reducing bacterium, *Desulfotomaculum nigrificans* (*Clostridium nigrificans*) was designated as the type species. In a previous study of 30 strains of nonsporulating sulfate-reducing bacteria, it was shown that these organisms could be divided into three groups as judged by deoxyribonucleic acid (DNA) base composition (G. F. Saunders, L. L. Campbell, and J. R. Postgate, J. Bacteriol. 87:1073, 1964). Therefore, it was of interest to determine whether the strains currently classified as *D. nigrificans* could also be further subdivided on the basis of their DNA base composition.

Twenty strains of *D. nigrificans* were studied. The maintenance of stock cultures, the media, and the cultivation conditions were described previously (Saunders et al. J. Bacteriol. 87:1073, 1964). DNA was isolated and purified by a modification of the method of J. Marmur (J. Mol. Biol. 3:208, 1961) as described by Saunders et al. (J. Bacteriol. 87:1073, 1964). The buoyant density of the DNA was determined by CsCl density gradient centrifugation as described by Saunders et al. (J. Bacteriol. 87:1073, 1964) with N^{15} -labeled *Pseudomonas aeruginosa* DNA (ρ =

1.742 g/cc) as a density reference standard. Density determinations and the calculated guanine plus cytosine (GC) contents of the DNA preparations are given in Table 1. The buoyant densities of the preparations were quite similar. The mean GC content for the 20 strains of *D. nigrificans* was 45.6 ± 1 moles per cent. It is evident that the 20 strains form a homogenous group as judged by their DNA base composition. The value of $45.6 \pm 1\%$ GC clearly distinguishes this sporeforming species from species of *Clostridium* (C. L. Schildkraut, J. Marmur, and P. Doty, J. Mol. Biol. 4:430, 1962; J. Marmur, S. Falkow, and M. Mandel, Ann. Rev. Microbiol. 17:329, 1963; B. Tonomura, R. Malkin, and J. C. Rabinowitz, J. Bacteriol. 89:1438, 1965) and lends further support to the views of Campbell and Postgate (Bacteriol. Rev. 29:359, 1965) on the removal of this species from the genus *Clostridium*.

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TABLE 1. Deoxyribonucleic acid base composition of strains of *Desulfotomaculum nigrificans* deduced from buoyant density determinations

Strain and no. ^a	Buoyant density ^b	Guanine + cytosine
	g/cc	%
Teddington Garden (8351), American Type Culture Collection strain 7946, National Canners Association strain 3750, Seeley 134	1.708	44.7
Staines G (8353), Holland DT (8355), New Jersey 75T (8358), Delft 3T (8359), Delft 13T (8360), Delft 15T (8361), Delft 1T (8394), Delft 74T (8395), Mol-lasses-Scarr (8706), Scarr (8788), Duck Pond, Bone Yard, Seeley 106	1.709	45.6
Holland CT (8356), Delft 48T (8357), Seeley 55	1.710	46.6

^a Numbers in parentheses refer to the National Collection of Industrial Bacteria, Aberdeen, Scotland. We are indebted to J. R. Postgate, J. D. A. Miller, and J. M. Shewan for making the NCIB cultures available.

^b Calculated according to the equation of N. Sueoka (J. Mol. Biol. 3:31, 1961).