Rejection of *Clostridium putrificum* and Conservation of *Clostridium botulinum* and *Clostridium sporogenes*

Request for an Opinion

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***Clostridium putrificum* (Trevisan 1889) Reddish and Rettger 1922; *Clostridium botulinum* (van Ermengem 1896) Bergey, Harrison, Breed, Hammer, and Huntton 1923; and *Clostridium sporogenes* (Mechnikoff 1908) Bergey, Harrison, Breed, Hammer, and Huntton 1923 are genetically related at the species level. We propose rejection of the name *C. putrificum* (which has priority) and conservation of the name *C. botulinum* on the basis of Rules 23a and 56a of the International Code of Nomenclature of Bacteria and conservation of the name *C. sporogenes* for nontoxigenic strains according to Rules 23a and 56b.**

Recent study in our laboratory using the DNA S1 nuclease analysis of Johnson (3) showed that the type strains of *Clostridium sporogenes* (Mechnikoff 1908) Bergey, Harrison, Breed, Hammer, and Huntton 1923 (VPI 1963^T = ATCC 3584^T) and *Clostridium putrificum* (Trevisan 1889) Reddish and Rettger 1922 (VPI 4440-1^T = ATCC 25784^T) are genetically homologous, with a mean similarity of 92% (based on four analyses).

Previously, Lee and Riemann (5), using DNA-DNA membrane competition analyses, demonstrated that toxigenic strains of *Clostridium botulinum* (van Ermengem 1896) Bergey, Harrison, Breed, Hammer, and Huntton 1923 were genetically very highly related to widely recognized strains of *C. sporogenes*. Thus, these three proteolytic species are the same genetic entity. The mechanism by which some strains gain toxigenicity is not known, but the property is reasonably stable, and the neurotoxin produced is among the most potent known to humanity. Although there appear to be slight differences in the cellular fatty acid composition of toxigenic strains and that of many nontoxigenic strains (1), only toxin tests in animals can differentiate the strains with certainty.

The name *C. putrificum* has priority over the others, but it is not well recognized in the broad fields of public health and medicine and in the food and pharmacological industries. The type strain of *C. putrificum* is not toxigenic, as opposed to *C. botulinum* strains, which are considered to be Class III pathogens and are distributed by the American Type Culture Collection only with signed statements assuming all risks and responsibilities for laboratory handling (2). Use of the single name *C. putrificum*, which does not denote the significant difference between toxigenic, or *C. botulinum*, strains and nontoxigenic strains, would present serious health risks. Thus, in relation to *C. botulinum*, we request that the name *C. putrificum* be rejected and listed as a nomen periculosum (Rules 23a and 56a-5 [4]). For the toxigenic strains, we request that *C.*

botulinum be placed on the list of conserved names (Rule 23a [4]).

After the rejection of the name *C. putrificum* as a perilous name, *C. botulinum* would have priority over the common nontoxigenic soil species *C. sporogenes*. Strains of *C. sporogenes* have long been used by the canning industry for quality control of food preservation procedures because it is well established that procedures which destroy *C. sporogenes* also destroy the deadly *C. botulinum*. To avoid major confusion and tremendous public, medical, industrial, and educational expense (not to mention possible public panic) that would result if all strains of this genetic entity were labeled *C. botulinum*, we request conservation of the name *C. sporogenes* for the nontoxigenic strains (Rules 23a and 56b [4]).

We believe that these requests best serve the first principle and purpose of nomenclature, which include stability of names and rejection of names that may cause error or confusion (4). Circumscription of the species *C. botulinum* and *C. sporogenes* to include toxigenic and nontoxigenic strains, respectively, further serves Principle 8 of the bacteriological code (4).

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