Validation of *Cyanobacteriales* Stanier in Gibbons and Murray 1978 as a New Order of the Kingdom *Procaryotae* Murray 1968, and of the Use of Neuter Plural Endings for *Photobacteria* and *Scotobacteria* classes nov. Gibbons and Murray 1978

Request for an Opinion

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The blue-green bacteria have been called by the vernacular name cyanobacteria for some time, and an order *Cyanobacteriales* Stanier in Gibbons and Murray 1978 seems the most appropriate name for them. Validation of this name is requested even though there is no corresponding genus in the order. As the *International Code of Nomenclature of Bacteria*, 1976 revision, does not specify specific endings for taxa above the rank of order, validation of the neuter plural nouns *Photobacteria* and *Scotobacteria* for the new classes proposed by Murray and Gibbons 1978 is requested.

Recently, Gibbons and Murray (2) proposed a classification for the higher taxa of bacteria. The kingdom *Procaryotae* Murray 1968 (7) was divided into three divisions on the basis of cell wall staining reaction and biochemistry: namely, *Gracilicutes* and *Firmacutes* Gibbons and Murray 1978 and *Mollicutes* Edward and Freundt 1967 (1). *Gracilicutes* comprises organisms with gram-negative cell walls and contains two new classes: *Photobacteria* and *Scotobacteria*. The class *Photobacteria* is divided into two subclasses: *Oxyphotobacteriae* and *Anoxyphotobacteriae*. The subclass *Oxyphotobacteriae* would comprise two orders: *Cyanobacteriales* (ordo nov.) and *Prochlorales* Lewin 1977 (6).

According to Rule 15 of the 1976 revision of the *International Code of Nomenclature of Bacteria* (4), "For each named taxon of the various taxonomic categories (listed below), there shall be designated a nomenclatural type." The taxa listed in Table 2 (p. 18 of reference 4) range from species to class. The types proposed are as follows: division *Gracilicutes*, class *Photobacteria*, subclass *Oxyphotobacteria*, and order *Cyanobacteriales*.

Two nomenclatural problems arise from the proposals outlined above, and opinions are requested to resolve them. These are as follows.

(i) The type of an order is the "genus on whose name the higher taxon is based" (see p. 18 of reference 4). But the cyanobacteria (10, 11) have been considered as plants until recent

times, and a genus "*Cyanobacterium*" is unknown, although there are several with the prefix "cyano," e.g., *Cyanococcus* Hansgirg 1905, 521 (3). Names such as *Cyanophyta* Steinecke 1931 (12) and *Cyanophyceae* Sachs 1874 (9) are well known but are used for the rank of phylum and class, respectively. With the proposed classification, these become synonyms of the order *Cyanobacteriales* as used by Gibbons and Murray (2). The only genus of cyanobacteria with the suffix implying bacterium is the recently described *Gloeobacter* Rippka, Waterbury, and Cohen-Bazire 1974, 435. However, this genus is not representative of the blue-green bacteria as a whole as it does not contain thylakoids. Furthermore, the prefix "glois" (gelatinous, viscid) does not describe the whole order as effectively as does the prefix "cyano."

Other current names of blue-green bacteria are also inappropriate to construct a new ordinal name because the existing botanical class includes orders that might cause nomenclatural confusion with the present proposal to rank the cyanobacteria as an order rather than a higher taxon.

R. Y. Stanier was one of the first to use the term cyanobacteria and stress the relation of these organisms to other bacteria (10, 11). Although Lewin (5) has made objections to such a change and would prefer to retain the name *Cyanophyceae* on the basis of priority, it would seem that this would only continue the confusion. A name is needed that parallels this time-honored designation, that is readily understood,

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and that is expressive. We therefore request that the name *Cyanobacteriales* Stanier *in* Gibbons and Murray 1978 be made a correct, validly published, and legitimate name.

(ii) A second problem concerns the proper ending for taxa above the rank of order. Rule 7 (4) indicates that the names of taxa above the rank of genus are of the feminine gender. Rule 8, which deals with taxa above the rank of order, does not indicate that the feminine gender is a requirement. In fact, one of the examples given, *Schizomycetes*, is masculine. Considering the variety of endings already required for the lower taxa and in the interest of simplicity, it is requested that the neuter plural endings, as proposed by Gibbons and Murray (2) for *Photobacteria* and *Scotobacteria*, be accepted as valid and legitimate endings for the rank of class.

REPRINT REQUESTS

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