
B. J. Tindall*

**Abstract**

In a recent publication, data was presented supporting *Bacillus axarquiensis* Ruiz-García *et al.* 2005, *Bacillus malacitensis* Ruiz-García *et al.* 2005 and *Brevibacterium halotolerans* Delaporte and Sasson 1967 (Approved Lists 1980) being treated as heterotypic synonyms. The nomenclatural consequences proposed were that under these circumstances the correct name to be used is *Bacillus axarquiensis* Ruiz-García *et al.* 2005, but this is not consistent with the wording of the International Code of Nomenclature of Prokaryotes and it is, therefore, it is necessary to establish the correct name to be used.

Dunlap *et al.* [1] have presented evidence that *Bacillus axarquiensis* Ruiz-García *et al.* 2005, *Bacillus malacitensis* Ruiz-García *et al.* 2005 and *Brevibacterium halotolerans* Delaporte and Sasson 1967 (Approved Lists 1980) should be treated as heterotypic synonyms, and came to the conclusion that *Bacillus malacitensis* Ruiz-García *et al.* 2005 and *Brevibacterium halotolerans* Delaporte and Sasson 1967 (Approved Lists 1980) should be classified as *Bacillus axarquiensis* Ruiz-García *et al.* 2005. In other words, the correct name to be used would be *Bacillus axarquiensis* Ruiz-García *et al.* 2005. However, this is not consistent with the wording of the International Code of Nomenclature of Prokaryotes [2].

The critical wording of the Code is to be found under Rule 23a:

‘The name of a species is a binary combination of a generic name and specific epithet (see Rule 12a). In a given position, a species can bear only one correct epithet, that is, the earliest that is in accordance with the Rules of this Code.’

‘Note 1. In the case of a species, Rule 23a must be applied independently of the generic name and the specific epithet. The specific epithet remains the same on transfer of a species from one genus to another, unless the specific epithet has been previously used in the name of another species or subspecies of the genus to which the species is to be transferred (see Rule 41a).’

With reference to the names of species that are a binary combination of a genus name and a specific epithet the correct epithet is to be selected. In the case of *Bacillus axarquiensis* Ruiz-García *et al.* 2005, *Bacillus malacitensis* Ruiz-García *et al.* 2005 and *Brevibacterium halotolerans* Delaporte and Sasson 1967 (Approved Lists 1980) the authors of the combinations are also the authors of the epithets and it follows that the earliest epithet is *halotolerans* Delaporte and Sasson 1967 (Approved Lists 1980).

The second issue that arises is the selection of the genus name. Since *Bacillus axarquiensis* Ruiz-García *et al.* 2005, *Bacillus malacitensis* Ruiz-García *et al.* 2005 and *Brevibacterium halotolerans* Delaporte and Sasson 1967 (Approved Lists 1980) are not the nomenclatural types of taxa at the rank of genus, the authors may select the genus name that is to be used based on their opinion concerning the position of the taxon. In this case, it would appear that the species is to be assigned to the genus *Bacillus* and the resulting combination should be *Bacillus halotolerans* (Delaporte and Sasson 1967). However, this combination has not been validly published and was not proposed by Dunlap *et al.* [1].

Although Dunlap *et al.* [1] indicated that *Brevibacterium halotolerans* Delaporte and Sasson 1967 (Approved Lists 1980) is known not to be a member of the genus *Brevibacterium* it is important to confirm whether assignment to the genus *Bacillus* is not based on the properties of a single deposit in one culture collection. A search of the information available on the internet indicates that *Brevibacterium*...
**Bacillus malacitensis** Delaporte and Sasson 1967 (Approved Lists 1980) was initially deposited in the collection in Paris (CIP) as CIP 67.21, for which a 16S rRNA gene sequence has been determined and it is available via the online catalogue. ATCC 25096, a strain that was accessed directly from the Institute Pasteur has had its genome sequence determined, as reported by Dunlap *et al.* [1] and it is deposited in GenBank under the access number LPVF01000000. The DSM catalogue entry for DSM 8802, a strain obtained via H. Seiler in Weihenstephan, whom in turn had obtained the strain from the ATCC (i.e. ATCC 25096) indicated that the 16S rRNA gene sequence had also been determined and deposited under the accession number AM747812. Alignment of the 16S rRNA gene sequence of strain CIP 67.21 (1419 bases) against that of DSM 8802 (AM747812, 1545 bases) showed no differences over the 1419 bases that are common to both. Similarly, the alignment of the 16S rRNA gene sequence from DSM 8802 (AM747812, 1545 bases) against the 16S rRNA gene annotated in the genome of ATCC 25096 in contig LPVF01000003 as [region complement (3036…>4590), /locus_tag='AU387_20080' /product='16S ribosomal RNA'] showed an alignment over 1540 bases with no differences observed. Consequently, within the limitations of the resolution of 16S rRNA gene sequences, taken together with strain histories it can be concluded that CIP 67.21, ATCC 25096 and DSM 8802 are members of the same taxon and may represent deposits of the type strain in three different collections in three different countries.

Based on the evidence presented by Dunlap *et al.* [1] indicating that *Bacillus axarquensis* Ruiz-García *et al.* 2005, *Bacillus malacitensis* Ruiz-García *et al.* 2005 and *Brevibacterium halotolerans* Delaporte and Sasson 1967 (Approved Lists 1980) should be treated as heterotypic synonyms and that the epithet *halotolerans* Delaporte and Sasson 1967 (Approved Lists 1980) has priority, it is necessary to create the combination *Bacillus halotolerans* (Delaporte and Sasson 1967).

**Bacillus halotolerans** (Delaporte and Sasson 1967) *comb. nov.*

**Synonyms:**


Etymology: Gr. n. hals halos, salt; L. part. adj. tolerans, tolerating; N.L. part. adj. halotolerans, salt tolerating.

The properties are those listed by Jones and Keddie [3] for *Brevibacterium halotolerans* Delaporte and Sasson 1967 (Approved Lists 1980). In addition, the 16S rRNA gene sequence of DSM 8802 has been deposited in GenBank under the accession number AM747812. The genome sequence of ATCC 25096 has been deposited in the NCBI GenBank under the accession number LPVF01000000.

Type strain deposits, for which the documented evidence has been presented as well as 16S rRNA sequence similarities and strain histories, indicates that they are all derived from the same original type material: ATCC 25096=DSM 8802. Other deposits are documented as being derived from the original type material: CCUG 47676 and JCM 12400.

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**Conflicts of interest**

The author is employed by an organisation that commercially offers both taxonomic services as well as biological material to the scientific community, which may be perceived as a potential conflict of interest.

**References**

1. Dunlap CA, Bowman MJ, Schisler DA, Rooney AP. Genome analysis shows *Bacillus axarquensis* is not a later heterotypic synonym of *Bacillus mojavensis*; Reclassification of *Bacillus malacitensis* and *Brevibacterium halotolerans* as heterotypic synonyms of *Bacillus axarquensis*. *Int J Syst Evol Microbiol* 2016;66:2438–2443.


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