Taxonomic Note

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The nomenclatural type of the genus *Deleya* and the consequences of *Deleya aesta* and *Alcaligenes aquamarinus* being synonyms

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The genus *Deleya* was created to encompass a number of marine organisms that had previously been classified in diverse genera. *Deleya aesta* was designated as the type species of the genus. Subsequent work indicated that *Deleya aesta*, *Alcaligenes aquamarinus* and *Alcaligenes faecalis* subsp. *homari* were heterotypic synonyms. Consequently, Akagawa & Yamasato (*Int J Syst Bacteriol* **39**, 462–466, 1989) concluded that, based on Rules 23a and 51b of the *Bacteriological Code* (1975 Revision), the oldest legitimate species epithet was *aquamarinus* and the type species of the genus *Deleya* should therefore be changed to *Deleya aquamarina*. Dobson & Franzmann (*Int J Syst Bacteriol* **46**, 550–558, 1996) concluded that it was not possible to distinguish between members of the genus *Deleya* and members of the genus *Halomonas* Vreeland *et al.* 1980, leading them to transfer members of the genus *Deleya* to the genus *Halomonas* and resulting in the creation of a new combination, *Halomonas aquamarina*. Closer examination of some of these changes indicates that they are not all in accordance with the Rules of the *Bacteriological Code* (1975 or 1990 Revisions).

The designated type species of the genus *Deleya* Baumann *et al.* 1983 is *Deleya aesta* (Baumann *et al.* 1972) Baumann *et al.* 1983. Work by Akagawa & Yamasato (1989), including DNA–DNA hybridization, indicated that *D. aesta*, *Alcaligenes aquamarinus* and *Alcaligenes faecalis* subsp. *homari* should be placed in a single species. The authors invoked Rules 23a and 51b of the *Bacteriological Code* (1975 Revision) (Lapage *et al.*, 1976) and came to the conclusion that the oldest synonym within these three species was *A. aquamarinus*; they therefore proposed that the combination *Deleya aquamarina* should be created and that, with the recognition of *D. aesta* as a synonym of *D. aquamarina*, the type species of the genus *Deleya* must be changed to *D. aquamarina*. At the same time, the authors also pointed out that the type strain of the type species was ATCC 14400^T (=IAM 12550^T). However, the interpretation presented by Akagawa & Yamasato (1989) is incorrect, since they did not take into consideration Rule 15 of the *Bacteriological Code* (1975 and 1990 Revisions) (Lapage *et al.*, 1976, 1992), which states that:

‘The nomenclatural type, referred to in this Code as “type,” is that element of the taxon with which the name is permanently associated’.

Rule 17 also states:

‘The type determines the application of the name of a taxon if the taxon is subsequently divided or united with another taxon.’

These Rules therefore override Rule 51b and mean that the type species of the genus *Deleya* Baumann *et al.* 1983 remains *D. aesta* (Baumann *et al.* 1972) Baumann *et al.* 1983, despite the fact that the combination *A. aquamarinus* (ZoBell and Upham 1944) Hendrie *et al.* 1974 is older. Thus, the proposal to adopt the combination *D. aquamarina* Akagawa and Yamasato 1989 as the type species of the genus *Deleya* presents us with a case where a nomenclatural proposal is illegitimate because it contravenes two of the Rules of the *Bacteriological Code*. Firstly, the proposal to change the type species of the genus *Deleya* contravenes Rule 15 and is, therefore, illegitimate (Rule 3, Rule 23a ii, Note 5). In addition, the combination *D. aquamarina* Akagawa and Yamasato 1989 is also illegitimate because the authors should have adopted the name *D. aesta* [Rule 51b (1)].

In subsequent years, it has been shown that it is not possible to distinguish clearly between members of the genera *Halomonas* Vreeland *et al.* 1980 and *Deleya* Bauman *et al.* 1983, resulting in the transfer of members of the genus *Deleya* to the genus *Halomonas* and an emended description of the genus *Halomonas* (Dobson & Franzmann, 1996).

One of the consequences was that *D. aquamarina* Akagawa and Yamasato 1989 was transferred to the genus *Halomonas* Vreeland *et al.* 1980 emend. Dobson & Franzmann 1996 as *Halomonas aquamarina* (ZoBell and Upham 1944) Dobson and Franzmann 1996. However, as we have seen, the name *D. aquamarina* Akagawa and Yamasato 1989 is illegitimate and does not have priority over *D. aesta*. Rule 41a of the *Bacteriological Code* (1990 Revision) (Lapage *et al.*, 1992) states that:

‘When a species is transferred to another genus without any change of rank, the specific epithet must be retained, or if it has not been retained (in a previous publication), it must be re-established’,

which would indicate that *D. aesta* should be transferred to the genus *Halomonas* as *Halomonas aesta*.

Taking into consideration that Dobson & Franzmann (1996) consider *D. aesta* to be a member of the genus *Halomonas*, it is no longer considered to be the type species of the genus in which it is placed (i.e. the genus *Halomonas*). Rule 41a (2) also states:

‘Unless (2) there is available an earlier validly published and legitimate specific or subspecific epithet’,

which indicates that the oldest validly published and legitimate epithet is *aquamarina*. It should be noted that, although *A. faecalis* subsp. *homari* is not a member of the species *A. faecalis*, and should be transferred to the genus *Deleya*, applying Rule 50a would suggest that the subspecies epithet *homari* should be raised to a species epithet. However, this epithet is a later synonym of the epithet *aquamarina*. Rule 50a governs the way in which a species name is to be formed when a subspecies is elevated in rank to a species. Thus, the combination *Halomonas aquamarina* must be used when transferring *D. aesta* to the genus *Halomonas*. This is an excellent example in support of Rule 41a (2) for which an example was previously lacking. It should be noted that, despite the fact that we are dealing with a number of synonyms, this also has consequences for the designations of the synonyms and the corresponding type strains.

When placed in the genus *Deleya*, *A. aquamarinus*, *A. faecalis* subsp. *homari* and *D. aesta* are considered to be heterotypic synonyms (Akagawa & Yamasato, 1989); despite the fact that *A. aquamarinus* is the earlier synonym, *D. aesta* (Baumann *et al.* 1972) Baumann *et al.* 1983 has priority

(as nomenclatural type of the genus *Deleya*). The type strain of *Deleya aesta* is strain 134^T (=ATCC 27128^T=DSM 4739^T=NCIMB 1980^T=IAM 12551^T).

When placed in the genus *Halomonas*, *A. aquamarinus*, *A. faecalis* subsp. *homari* and *D. aesta* are considered to be heterotypic synonyms (Akagawa & Yamasato, 1989; Dobson & Franzmann, 1996); in this case, the earlier synonym does have priority and the correct combination is *Halomonas aquamarina* (ZoBell and Upham 1944) Dobson and Franzmann 1996. The type strain of *Halomonas aquamarina* is ATCC 14400^T (=DSM 30161^T=IAM 12550^T=NCIMB 557^T).

This provides an interesting example of a case where the correct combination of a species name changes when the organism alters its taxonomic position. Similarly, despite the fact that we are dealing with heterotypic synonyms that may be united in one species (Akagawa & Yamasato, 1989), the type strain of that species will change depending on whether the organism is considered to be a member of the genus *Halomonas* or the genus *Deleya*.

References

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