Replacement of ATCC 25944T, the current type strain of *Melittangium lichenicola*, with ATCC 25946. Request for an Opinion

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It is proposed that the type strain of *Melittangium lichenicola* (Thaxter 1892) McCurdy 1971 is ATCC 25946 (=DSM 14877), which was originally designated as a reference strain by McCurdy, and not ATCC 25944T, as given in the Approved Lists. Swarm appearance, myxospore morphology and 16S rRNA gene sequence data suggest that ATCC 25946 is a representative of the species *Melittangium lichenicola*, while strain ATCC 25944 is clearly a member of the *Myxococcus–Corallococcus* clade. A Request for an Opinion to this effect is made to the Judicial Commission of the International Committee on Systematics of Prokaryotes.

In his description of *Melittangium lichenicola*, McCurdy (1971) cited material Acc. No. 4500 and 5170 of the Thaxter Collection, Farlow Herbarium, Harvard University, as the type material of the species and strain ATCC 25946 (strain Windsor M201) as a reference strain. In the Approved Lists of Bacterial Names (Skerman et al., 1980), strain ATCC 25944T (equivalent to strain M155T and DSM 2275T) is listed as the type strain of the species. Nevertheless, McCurdy restates Acc. No. 4500 and 5170 of the Farlow Herbarium as type material and ATCC 25946 as a reference strain in the section on *Melittangium* in *Bergey’s Manual* (McCurdy, 1989); again, strain ATCC 25944 was not cited.

Obviously following McCurdy’s view, L. Shimkets and C. R. Woese determined the 16S rRNA gene sequence of ATCC 25946 in 1993 (GenBank accession no. M94277). When the phylogenetic position of the sequence represented by M94277 was analysed by Spro¨er et al. (1999), it clustered within the *Myxococcus–Corallococcus* branch and was only distantly related to sequences deposited for two *Melittangium* strains, *Melittangium boletus* Me b8 (=DSM 14713) (GenBank accession no. AJ233908) and *Melittangium alboraceum* Me b7 (=DSM 52894) (AJ233907). On the Approved Lists (Skerman et al., 1980), no type strain is given for *Melittangium boletus*, and microscope slides ‘UHM Slides Peterson 72’ are listed as the type material for *Melittangium alboraceum*. In other words, no proliferating type material exists that could serve as the parent material for 16S rRNA gene sequencing of these two species. For that reason, Reichenbach (2005) assigned strain Me b8 as the type strain of *Melittangium boletus*. However, as yet this proposal has no standing in nomenclature.

We determined the 16S rRNA gene sequence of the assigned type strain for *Melittangium lichenicola*, ATCC 25944T, and the sequence was deposited as GenBank accession no. AM930268. Similar to M94277, reportedly derived from strain ATCC 25946, the sequence clustered with sequences of *Corallococcus* strains rather than of *Melittangium* strains. The sequence DQ768126 obtained for *Melittangium lichenicola* DSM 2275T, a derivative of ATCC 25944T, is identical to that of ATCC 25944T, confirming that the sequence of ATCC 25944T was correct (Fig. 1).

Resequencing of the 16S rRNA gene of cultures ATCC 25946 and its derivative DSM 14877, deposited as GenBank accession numbers AM930269 and AM930267, respectively, resulted in identical sequences for these two cultures (Fig. 1). These sequences did not match sequence M94277, deposited earlier for this strain, and showed similarities of less than 96% to sequences of the *Myxococcus–Corallococcus* clade, but they were highly similar to the sequences of *Melittangium alboraceum* Me b7 (GenBank accession no. AJ233907) and *Melittangium boletus* Me b8 (AJ233908 and DQ768125) (98.0, 98.4 and 98.3%, respectively). The neighbour-joining tree including these sequences shows a clear clustering of the sequence of ATCC 25946 with those of strains of *Melittangium* and *Cystobacter* species (Fig. 1). Conspicuous is the high relatedness of *Melittangium lichenicola* ATCC 25946 with those of strains of *Melittangium* and *Cystobacter fuscus* ATCC 25194T (Fig. 1). The question of whether the retention of the two genera *Cystobacter* (type species *Cystobacter fuscus*) and *Melittangium* (type species *Melittangium boletus*) is justified in the light of 16S rRNA gene sequence similarity of 98.2% between its representa-
The morphologies of strains ATCC 25944T and ATCC 25946 and their respective derivatives DSM 2275T and DSM 14877 were investigated. The strains were inoculated onto streaks of heat-treated Escherichia coli cells on water agar (Reichenbach & Dworkin, 1992). Strains ATCC 25946 and DSM 14877 formed translucent swarms with a tough consistency and orange-coloured pustules arranged in radial ridges on the agar surface. The swarms covered a diameter of 30 mm within 3 days. Within the pustules, slightly S-formed rods resembling myxospores characteristic of Melittangium were found. These morphological features were in accord with the properties described for Melittangium. Strains DSM 2275T and ATCC 25944T formed rough swarms, 10 mm in diameter after 3 days, with a soft consistency. On maturation of the culture, a part of the cells became shorter and wider and coccoid cells appeared, resembling the myxospores of Myxococcus or Corallococcus species. However, the cocci were very small (1 µm in diameter) and seemed to be degenerated myxospores. They did not develop to refractive myxospores. Based on the morphological appearance, there is no doubt that the DSMZ cultures are the correct descendants of the ATCC cultures. Swarm and cell appearance of DSM 2275 and ATCC 25944 were in accord with the sequencing results; these cultures should be regarded as members of the Myxococcus–Corallococcus clade which have lost the ability to produce fruiting bodies and myxospores. In other words, these cultures do not represent the species Melittangium lichenicola as described by Thaxter (1892) and McCurdy (1971).

From the results presented, we conclude that strain ATCC 25944T and its derivative DSM 2275T are not members of the genus Melittangium but of the Myxococcus–Corallococcus clade. Since the morphology of strain ATCC 25946 is characteristic for Melittangium lichenicola and the rRNA gene sequences represented by GenBank accession numbers AM930269 and AM930267 cluster with other sequences derived from Melittangium strains, it is inferred that these sequences are the correct ones for ATCC 25946 and that strain ATCC 25946 (=DSM 14877) is a representative of the species Melittangium lichenicola. For these reasons, we request an Opinion of the Judicial Commission of the International Committee on Systematics of Prokaryotes to the effect that ATCC 25944T be rejected as the type strain of Melittangium lichenicola and be replaced by strain ATCC 25946 (=DSM 14877), which was suggested as a reference strain for this species by McCurdy (1971).

**Fig. 1.** Neighbour-joining phylogenetic tree, based on 16S rRNA gene sequences, showing the positions of strains ATCC 25944T (=DSM 2275T) and ATCC 25946 (=DSM 14877). Bootstrap values are shown as percentages of 1000 replicates. Bar, 1 substitution per 100 nucleotide positions.

### References


