Thiothrix phosphatis sp. nov.

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Table 1: Complete list of names proposed in the current register list.

Proposed Taxon	Etymology	Description	Parent Taxon	Type	Registry URL
Species *Thiothrix phosphatis*	[phos.pha'tis] **N.L. gen. n.** *phosphatis*, pertaining to phosphate	Chen et al. (2024), modified: A novel coccus *Thiothrix*-related polyphosphate-accumulating organism recovered from an acetate-fed enhanced biological phosphorus removal systen in a lab-scale sequencing batch reactor innoculated with activated sludge from a wastewater treatment plant in Guangzhou, China. Its acetate uptake rate (6.20 mmol C/g VSS/h) surpassed most *Ca.* Accumulibacter and known glycogen-accumulating organisms (GAOs), conferring their predominance in the acetate-fed system. Metatranscriptomic analysis suggested that *Thiothrix phosphatis* SCUT-1 employed both low- and high-affinity pathways for acetate activation, and both the conventional (PhaABC) pathway and the fatty acid β-oxidation pathway for PHA synthesis; additionally, a much more efficient FAD-dependent malate: quinone oxidoreductase (MQO) were encoded and employed than the traditional malate dehydrogenase (MDH) to oxidize malate to oxaloacetate in the TCA and glyoxylate cycle, collectively contributing to a higher acetate utilization and processing rate of this microorganism. Batch tests further demonstrated the versatile ability of this PAO in using VFA (acetate, propionate, and butyrate), lactate, amino acids (aspartate and glutamate), and glucose as carbon sources for EBPR, showing a partially overlapped but unique ecological niche of this microorganism comparing to *Ca.* Accumulibacter and known GAOs.	*Thiothrix*	NCBI Assembly: GCA_035668035.1 Ts	seqco.de/i:49035