Beggiatoa

Resembles: see remarks
Probes: phylum specific probe: Gam42a [2]
Frequency occurrence (200 samples; 175 WTPs): occasionally observed, but the population was always very small (FI < 1)

Characteristics

- straight/ bent filaments, free in the water between the flocs;
- filaments with gliding movement;
- not branched;
- variable filament length;
- cell diameter 1.5 to 2.5 µm;
- no attached growth;
- no sheath;
- septa sometimes visible;
- rectangular cells;
- *in situ* sulphur storage;
- Gram negative;
- Neisser negative.

Remarks

Beggiatoa belongs to the *Gammaproteobacteria* [1]. Species specific probes for the *in situ* identification of *Beggiatoa* sp. in activated sludge have not been developed, so far.

The combination of sulphur granules in the filaments with the gliding movement is so characteristic of *Beggiatoa* sp. that they cannot be confused with other species.

Physiology

Due to its aerobic cell metabolism, *Beggiatoa* needs molecular oxygen, but this bacterium is adapted to micro-aerophilic conditions.
Reduced sulphur compounds (H_2S, Thiosulphate) are required as an energy source and an electron donor and many strains use short chain fatty acids as their carbon source.

Occurrence in activated sludge

Beggiatoa occurs in treatment plants where a lot of reduced sulphur compounds are present in the influent (H_2S!). Growth is also stimulated by a major lack of oxygen. *Beggiatoa* filaments were only occasionally observed in the Macobs and Dynafilm samples.

Control options

Not relevant as *Beggiatoa* does not cause bulking of activated sludge. The filaments do not affect the settling velocity of the flocs. *Beggiatoa* is far more an indicator organism (lack of oxygen).

References

1. Howarth, R., I. M. Head and R. F. Unz (1998) Phylogenetic assessment of five filamentous bacteria isolated from bulking activated sludges. *Wat. Sci. Technol*. **37** (4-5), 303-306.

2. Manz, W., R. Amann, W. Ludwig, M. Wagner and K. H. Schleifer **(**1992) Phylogenetic oligodeoxynucleotide probes for the major subclasses of Proteobacteria: problems and solutions. *Sys. Appl. Microbiol*. **15**, 593-600

Slide show images

- 1-3: examples of *Beggiatoa* filaments in activated sludge
- The video shows gliding movement of the filaments