

## *Meganema perideroedes*

*Resembles: Thiothrix-021N* (belongs to the *Gammaproteobacteria*)

*Probes:* Group specific: ALF-968 [7]; species specific: Meg-983+1028 [10], EU12-645 and EU26-653 [6]; see remarks

*Frequency occurrence* (200 samples; 175 WTPs):

- observed with a FI  $\geq 1$  in 7 samples
- observed with a FI  $\geq 3$  in 2 samples



### *Characteristics*

- bent/curled, occasionally tangled filaments;
- occasionally rosettes of filaments;
- not motile;
- not branched;
- filament length  $\gg 200 \mu\text{m}$ ;
- cell diameter  $1.4 - 2.0 \mu\text{m}$
- sheath absent;
- attached growth absent;
- septa visible;
- cell shape variable: spherical, discoid or ovoid shaped;
- no sulphur storage, but other granules might be present;
- Gram negative or somewhat variable;
- Neisser negative.

### *Remarks*

*Meganema perideroedes* also belongs to the filamentous *Alphaproteobacteria*, but its morphology resembles *Thiothrix-021N* instead of the *N. limicola* morphotypes.

*Meganema perideroedes* includes two closely related strains which usually occur together. Both hybridise with the probe-mix Meg-983+1028 [11]. They can be distinguished from each other by applying the probes EU12-645 and EU26-653 [6]. The strain giving a fluorescent signal with the latter probe exhibits a very remarkable succession of morphological features when grown in a liquid culture: free gonidia – rosettes of short filaments – rosettes with long filaments – bizarre shapes in an old culture. This sequence of morphological features is demonstrated in the image slide show.

The probe EU12-645 positive strain does not form gonidia or rosettes, but grows in axenic cultures as long filaments composed of spherical or more ovoid shaped cells.

The morphotypes hybridising with the probes EU12-645 and EU26-653 were tentatively named *Megathrix tenacis* and *Megathrix sidereus* respectively, in a paper dealing with the Macobs results [11]. These names are not used any longer.

See "*Candidatus Alysio-microbium bavaricum*" for additional remarks, physiology, occurrence in activated sludge, control options and references.

### ***Slide show images***

- Filaments in activated sludge
  - 1: morphology at a low magnification
  - 2-13: morphology at a high magnification
    - 2-5: discoid cells
    - 6-10: spherical or ovoid cells
    - 11-13: *in situ* formation of gonidia, rosettes and knots
  - 14: occasionally Gram variable
  - 15: FISH image with probe EU26-653
- Photos of filaments in pure cultures. These images were made in 1975 and the pure cultures have not been stored. It is therefore not absolutely certain that the strains available at that time were identical to the *Meganema* pure cultures giving hybridisation signals to the probes EU12-645 and EU26-653. The morphological features of the strains isolated in 1975 are, however, identical to those of the recently isolated strains in Italy and Denmark.
  - Culture strongly resembling the probe EU26-653 positive strain. The images show the development of the biomass after transferring some biomass into a fresh liquid medium.
    - 16: So-called gonidia are formed from the end of an 'old' filament
    - 17: free gonidia develop knobs by which they attach to each other at their basis → rosette
    - 18-24: formation and maturing of rosettes
    - 25-28: matured filaments; often filled with stored compounds
    - 29-31: bizarre shapes in old cultures
  - Culture strongly resembling the probe EU12-645 positive strain
    - 32-37: Neither gonidia, nor formation of rosettes. Filaments might be filled with stored compounds and large bundles of filaments were sometimes observed