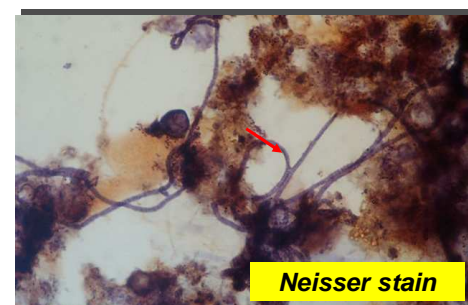
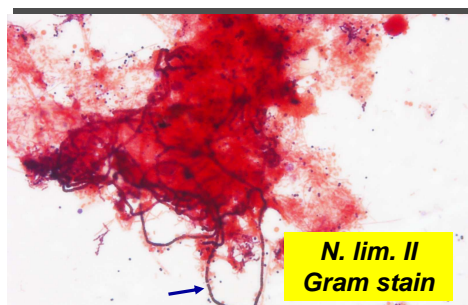
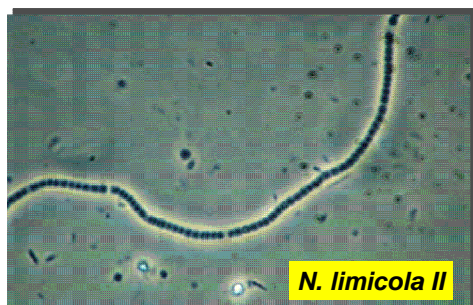


22th INTERNATIONAL SPECIALIZED COURSE OPERATION AND CONTROL OF ACTIVATED SLUDGE PROCESSES USING MICROBIOLOGICAL ANALYSIS Perugia - Italy

FILAMENTOUS MICROORGANISMS IN ACTIVATED SLUDGE

Nostocoida limicola I, II, III

		UNDER PHASE CONTRAST OBSERVATION		
		<i>Nostocoida limicola</i> I	<i>Nostocoida limicola</i> II	<i>Nostocoida limicola</i> III
OBSERVATION AT 1000x	Sulfur Granules	-	-	-
		<i>In situ</i>	-	-
		<i>S Test</i>	-	-
	Other Cell Inclusions	PHA	PHA	PHA
	Filament Diameter	0.8 - 1.0 µm	1.4 µm	2.0 µm
	Filament Length	40 - 100 µm	50 - 200 µm	100 - 300 µm
	Filament Shape	Coiled	Coiled	Coiled
	Filament Location	Mostly within the floc, Extends from floc surface	Mostly within the floc, Extends from floc surface	Mostly within the floc, Extends from floc surface
	Cell Septa clearly observed	+	+	+
	Indentations at Cell Septa	+	+	+
	Sheath	-	-	-
	Attached Growth	-	-	-
	Cell Shape and Size	Ovals 0.8 - 1.0 x 0.8 µm	Discs, ovals 1.4 x 1.0 - 1.5 µm	Discs, ovals 2.0 x 1.5 µm
	Notes:	-	Incidental branching; Gram and Neisser variable	-
UNDER DIRECT ILLUMINATION				
Gram Stain	+	-, +	-, +	
Neisser Stain	+	-, +	+	
	<i>Filament Granules</i>	-	-	



Microorganism	<i>Nostocoida limicola</i> I	<i>Nostocoida limicola</i> II	<i>Nostocoida limicola</i> III
Phylogenetic affiliation	Low G+C Gram positive Bacteria	High G+C Gram positive Bacteria and Alphaproteobacteria	unknown
Causes	High rbCOD	High rbCOD	Nutrient deficiency
Remedies	Anoxic, aerobic selectors; Cl ₂	Anoxic, aerobic selectors; Cl ₃	Add N or P compounds