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Characterization of the filamentous bacteria *Eikelboom* Type 0581 in Portuguese activated-sludge systems

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One of the major operational problems of activated sludge systems is the excessive growth of filamentous bacteria. This excessive growth of filamentous microorganisms causes a thick viscous scum or foam on the surface of the reactors (known as *foaming*) and an inadequate solid separation in the clarifiers (or *bulking*). Several different filament morphotypes have been described in systems treating domestic and industrial wastes but, in the absence of pure cultures, many of these have never been sufficiently characterized to resolve their taxonomy or to provide them with valid names. Hence, they are still referred to as numerical types persisting from the early studies of Eikelboom in 1975. The phylogeny of some important filamentous bacteria responsible for *bulking* and *foaming* problems, such as the Type 0092 and the Type 0914, was recently established. Still, there are plenty filamentous bacteria whose phylogeny and ecology remains unknown. In this study, the filamentous morphotype 0581 was studied, aiming at increasing the knowledge of the ecology of these microorganisms. This filamentous type is poorly described and most of its ecological needs unknown. Nevertheless, this is a morphotype frequent and abundant in Portuguese wastewater treatment systems. It morphologically resembles *Microthrix parvicella* or *Microthrix calida*, despite the different response to the Gram and Neisser stains, and a study claims to have found a bound between them based on the positive response of this morphotype to FISH probes developed for *Microthrix parvicella* and *Microthrix calida*. A total of 19 samples were analysed from 7 different Portuguese WWTP. The morphologic characterization was achieved by classical microscopic sludge analysis. Molecular biological methods were used to obtain information about their taxonomic affiliation. Statistical analyses were carried on to determine the operational and the environmental conditions that favour this microorganism.