

Taxonomic Relations among the Genera Belonging to the Family *Streptomycetaceae*

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The family *Streptomycetaceae* currently contains three distinct genera, namely *Streptomyces* Waksman and Henrici (1943), *Kitasatospora* Omura *et al.* (1983) emend. Zhang *et al.* (1997) and *Streptacidiphilus* Kim *et al.* (2003). The three genera are phylogenetically distinguished from one another, and can also be differentiated by the comparison of phenotypic and chemotaxonomic properties. One of the important criteria is the acidophily, though not an absolute one.

Acidophilic sporoactinomycetes are not rare in natural or artificial environment such as acidic forest and mine drainage soils where they form a major constituent of the actinomycete community. These organisms can be assigned to two phenotypically different groups, the neutrotolerant acidophilic and strictly acidophilic taxa, and the genus *Streptacidiphilus* was proposed recently in order to accommodate the majority of the strictly acidophilic strains. Meanwhile, most of the representative neutrotolerant acidophiles were found to have properties consistent with their classification in the genus *Streptomyces*. These organisms also formed diverse taxonomic groups that occupied distinct phyletic lineages in the 16S rDNA tree encompassed by *Streptomyces*.

In an experiment examining the physiological differences among the three genera of *Streptomycetaceae*, acidophily as well as nutritional requirements tended to separate the three genera clearly. Phylogenetic oligonucleotide primers differentiating the streptacidiphili or kitasatosporae from the other respective genera have been developed and successfully applied for the differentiation and detection of the target organisms using a diagnostic PCR procedure. A primer set that was specifically designed for kistasatosporae was found to amplify members of both *Streptacidiphilus* and *Kitasatospora*. Another set of the primers designated ACF and AC2R were found to amplify ca. 300 bp fragments only on the representatives of the genus *Streptacidiphilus*, and also from the isolates identified as belonging to *Streptacidiphilus*. Thus the combination of the two primer sets enabled differentiation of the three genera from one another.

It is interesting to see if acidophily can give some selective pressures in such environment, and the study of organisms from geographically different origins can provide a clue for this question. Acidophily may have played a key role in the evolution of the three actinomycete genera belonging to *Streptomycetaceae*.