Taxonomic Characteristic of the Strain ETH 7437 Producing Granaticin

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Abstract. The streptomycete strain ETH 7437, producing granaticin, was characterized according to present taxonomic standards and compared with the strains *Streptomyces olivaceus* (Waksman) Waksman and Henrici, *Streptomyces coelicolor* (Müller) and *Streptomyces violaceruber* (Waksman & Curtis). The strain ETH 7437 formed gray aerial mycelium, straight and flexuous sporophores, even single hooks and open spirals. Normally the amount of spores in chains was over 50, the surface of spores being smooth. The strain utilized D-glucose, D-arabinose, D-xylose and D-fructose. The strain was capable of forming antibiotic pigment stably. For the strain ETH 7437 the term *Streptomyces granaticolor* was proposed.

Our interest in taxonomically important characters of antagonistic actinomycetes led to this study of the strain producing granaticin, first described by Corbaz et al. (1957) and provisionally identified as *Streptomyces olivaceus*. The task of this paper being to describe the strain in question on the basis of present standards and methods.

Materials and Methods

Organisms.

The Collection of Eidgenössische Technische Hochschule Zürich kindly provided the strain *Streptomyces olivaceus* ETH 7437. *Streptomyces olivaceus* CCM 3188 (ATCC 3335) and *Streptomyces olivaceus* CCM 3082 (IFO 3200) were obtained from the Collection of Microorganisms of J. E. Purkyňe University, Brno, the strains *Streptomyces coelicolor* (C/16, C/41) and *Streptomyces violaceruber* (T/12, T/24, T/146) from the collection of the Institute of Microbiology of the Czechoslovak Academy of Sciences, Prague.

Cultivation and biochemical character.

The cultivation was carried out on “Difco” media at 28 °C. Taxonomic methods elaborated in the “International cooperative project for characterization and deposition of type cultures” (Shirling & Gottlieb, 1966) and Committee for bacteriological nomenclature (Gottlieb, 1963) were used.

Results and Discussion

The morphology of sporophores, the pattern of the surface of aerial spores, the ability to use certain carbon sources and to a certain extent even the genetically fixed ability to produce antibiotics belong to the most important taxonomic standards of streptomycetes (Pridham, 1964). The character cited as the last one caused much discussion and it is evident that it may have only the value of a subsidiary character. Even the production of pigments, except melanoid and those with antibiotic effect, is not considered to be a taxonomically reliable standard, with regard to the frequent and different effect of cultivation conditions.

Studying the strains *Streptomyces olivaceus* CCM 3188 and CCM 3082 we observed spiral sporophores (Fig. 1). Mentioned strains differed in this type of sporophores from the originally described strain *Streptomyces olivaceus* (Waksman) Waksman and Henrici, 1948 (Bergey, 1948) with straight or flexuous sporophores. The strain ETH 7437 provisionally identified as *Streptomyces olivaceus* produced long
Figure 1. Sporophores of *S. olivaceus* CCM 3188. Yeast extr. — malt extr. agar, 21 days, 28°C. (500×, photo J. Fiala.)

Figure 2. Straight sporophores of the strain ETH 7437. Inorganic salts-starch agar, 21 days, 28°C. (400×, photo J. Fiala.)

Figure 3. Hooks and flexuous sporophores of the strain ETH 7437. Yeast extr. — malt extr. agar, 8 days, 28°C. (400×, photo J. Fiala.)

Figure 4. Typical hook of the strain ETH 7437. Yeast extr. — malt extr. agar, 8 days, 28°C. (1000×, photo J. Fiala.)