TRANSFER OF THERMOACTINOMYCES VIRIDIS
SCHUURMANS ET AL. 1956 TO THE GENUS
THERMOMONOSPORA AS THERMOMONOSPORA
VIRIDIS (SCHUURMANS, OLSON AND
SAN CLEMENTE) COMB. NOV.

Eberhard Küster and Romano Locci

Department of Industrial Microbiology
University College, Dublin, Ireland

SUMMARY. Original descriptions and comparative studies indicate that Thermoactinomyces monosporus and Thermoactinomyces viridis produce single spores on aerial mycelium only and should be classified as a species of Thermomonospora. Thermoactinomyces viridis Schuurmans et al., 1956, becomes Thermomonospora viridis (Schuurmans et al.) comb. nov. Our isolate Pl01 is proposed as a neotype of Thermomonospora viridis and is deposited at NRRL (B-3044). The species name Thermoactinomyces monosporus (Lehmann and Schütze) Waksman should be recognized as a "nomen dubium" because of the inadequate description, particularly of its cultural and physiological characteristics and the lack of a culture of the type strain.

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Among some thermophilic actinomycetes isolated from various Irish peat samples one strain was particularly distinguished by its morphological and cultural behaviour. It produced single spores on the aerial mycelium only, and therefore resembles species of the genus Thermomonospora. The strain forms a greenish aerial mycelium and produces a green pigment. Organisms with a similar appearance have been described under the names Thermoactinomyces monosporus (Schütze 1908) Waksman and Corke 1953, and Thermoactinomyces viridis Schuurmans et al., 1956. No culture of the type strain of Thermoactinomyces monosporus is extant, so that a comparison can be based only on the description. Thermoactinomyces monosporus seems to be a

Thermomonospora as it forms single spores on the aerial mycelium only. Comparative studies with Thermoactinomyces viridis, strain No.159, which was kindly supplied as a lyophilized culture by Dr. B.H. Olson (Lansing, Michigan), showed general agreement with our strain (No. P101). There were only a few differences between Thermoactinomyces viridis strain No.159 and our strain. P101 produced a dark green pigment while No.159 did not, although pigment production was originally described by Schuurmans. Our strain did not show any antibiotic activity, whereas Thermoactinomyces viridis forms an antibiotic, thermoviridin, active against Gram-positive organisms. Apart from these differences, which are relatively unimportant taxonomically, our strain and Thermoactinomyces viridis strain No. 159 seem to be identical.

Schuermans et al., (1956) placed their species in the genus Thermoactinomyces. At that time the generic name Thermomonospora Henssen (1957) had not been proposed. The description of Thermoactinomyces and its spore formation was also completed by Henssen. Up to this time thermoactinomycetes were only characterized as thermophilic micromonosporas with the ability to form aerial mycelium. There was no differentiation between spore formation on aerial and vegetative mycelium. However, Erikson (1953) had already described spores on both types of mycelium. For these reasons we suggest the transfer of Thermoactinomyces viridis Schuurmans et al. to the genus Thermomonospora and propose Thermomonospora viridis (Schuurmans et al.) comb. nov.

Thermoactinomyces monosporus corresponds to Thermomonospora viridis with respect to its original description (Schütze 1908). The main difference is the failure to coagulate milk. This criterion is of doubtful significance when not carried out under standardized conditions, which Schütze could not do at the time. Schütze recorded the very occasional presence of two spores on the aerial mycelium, as we also found in our observations. These pairs of spores and their arrangement are clearly distinguished from those of Waksmania and cannot be confused with them. We propose that Thermoactinomyces monosporus (Lehmann and Schütze) Waksman be designated as a "nomen dubium." Cultures of this organism are no longer available, and the description, apart from that of the morphology, is incomplete and inadequate.

BACTERIOLOGICAL NOMENCLATURE
AND TAXONOMY

Strains from various sources were included in our studies. These were undescribed cultures obtained from Rothamsted Experimental Station at Dr. Corbaz' suggestion (isolated from hay dust [Gregory and Lacey 1962]) and from Dr. R. Craveri (Milan) (isolated from soil). This shows that Thermomonospora viridis occurs in various types of soil and other material without any previous or subsequent heating.

Description of Thermomonospora viridis
(Schuermans et al.) comb. nov.

Morphology: The hyphae of the vegetative mycelium are branched and occasionally show curved endings. Single spores were observed only on the aerial mycelium either sessile on the hyphae or on short sporophores which sometimes show a spike-like structure. Two spores occasionally occur. The spores are ovoid, 0.9-1.1 x 1.2-1.4 μ in size.

Cultural characteristics:

Nutrient Agar (Oxoid): Good growth of colorless vegetative mycelium with dark green reverse; greyish-green aerial mycelium is formed, and a dark green soluble pigment is produced.

Lab Lemco Agar (Oxoid) with and without 0.2% Yeast Extract (Difco): Growth as on Nutrient Agar.

Potato Dextrose Agar with and without 0.2% Yeast Extract: Moderate to good growth with greenish aerial mycelium.

Potato slices: No growth.

Oatmeal Agar: Poor growth with scant whitish aerial mycelium.

V8 Juice Agar: No growth.

Glycerol Asparagine Agar: Poor growth, no aerial mycelium.

Czapek Agar: No or very little growth.

Glucose Yeast Agar: Moderate or good growth with scant white aerial mycelium turning to greyish green.

Temperature relations: No growth at 27° and 65°C, good growth at 37° C; optimum temperature for growth is 55° and for sporulation, 45°C.

Physiological characteristics: Strong diastatic activity.

Gelatin hydrolyzed after 4 days. H₂S production (Lead Acetate Strip Test) positive. Very slight NO₃ reduction.

Melanin negative. Skim Milk (Difco) coagulated.

Media and methods employed in this study are described in detail by Küster and Locci (1963).

Habitat: Isolated from hay, peat and various soils.

Type strain: Cultures of the type strain (Strain P 101) have been deposited in the Centraalbureau voor Schimmelcultures at Baarn (CBS) and in the Northern Utilization Research and Development Division at Peoria, Illinois (NRRL B-3044).

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