Reclassification of Amycolatopsis orientalis subsp. lurida Lechevalier et al. 1986 as Amycolatopsis lurida sp. nov., comb. nov.

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Amycolatopsis orientalis subsp. lurida DSM 43134T differs significantly from the type strain of A. orientalis, A. orientalis subsp. orientalis DSM 40040T, and from other species of the genus in genomic and metabolic properties. Its elevation to species status as Amycolatopsis lurida sp. nov., comb. nov. is justified.

As indicated in the original description (Lechevalier et al., 1986), Amycolatopsis orientalis subsp. lurida differs from A. orientalis subsp. orientalis in only four of the 29 characteristics that were used originally by Gordon et al. (1978) to describe several Nocardia species. Of these, Nocardia orientalis was reclassified by Lechevalier et al. (1986) as A. orientalis. Moreover, genomic distinctness of the two subspecies was also noted, as the type strains shared only 46% DNA–DNA similarity as measured by the spectrophotometric method of Seidler & Mandel (1971). As the metabolic properties of A. orientalis subsp. lurida matched the description of the species A. orientalis (Gordon et al., 1978), A. orientalis and A. orientalis subsp. lurida were created, rather than two separate species. Although not included in the original description, the subspecies name A. orientalis subsp. orientalis (Pittenger & Brigham 1956) Lechevalier et al. 1986 was created automatically by the valid publication of A. orientalis subsp. lurida (ex Grundy et al. 1957) Lechevalier et al. 1986 (Rule 40d, Lapage et al., 1992).

In the course of the description of Amycolatopsis decaplanina (Wink et al., 2004), the type strains of the two subspecies of A. orientalis were included as reference strains in the analysis of genomic and metabolic properties. Similarity of the two almost-complete 16S rRNA gene sequences was 99.6% (GenBank accession nos: A. orientalis subsp. orientalis IMSNU 20058T, AJ400711; A. orientalis subsp. lurida DSM 43134T, AJ577997). The two subspecies were not phylogenetic neighbours, with strain IMSNU 20058T branching adjacent to Amycolatopsis japonica DSM 44213T. RiboPrint patterns of the two type strains, determined with the restriction enzyme PvuII, were distinctly different (Wink et al., 2004). Determination of DNA–DNA similarity by using the method of De Ley et al. (1970) and Huß et al. (1983) at 69°C in 2×SSC that contained 10% DMSO gave a similarity value of 45±2% (mean of 42±3 and 49±1%), which was virtually identical to the value of 46% that was determined by Lechevalier et al. (1986). Analysis of metabolic properties included determination of the utilization of carbohydrates on ISP 9 medium (Shirling & Gottlieb, 1966) by using a 12-well microtitre plate technique. A fingerprint of enzymic activities was obtained by using API 20E and API ZYM test strips (Wink et al., 2004). Comparison of data obtained from both strains confirmed most of the results of Lechevalier et al. (1986), including utilization of arabinose, fructose, glucose, inositol, mannitol and xylose, indicating that application of different tests performed at different times gives reliable results. Utilization of rhamnose and sucrose cannot be evaluated, as test results were combined for several strains of A. orientalis subsp. orientalis and for the type strain of A. orientalis subsp. lurida. The data of Lechevalier et al. (1986) and those obtained in this study partially complement each other, resulting in the identification of 14 properties in which the type strains of the two subspecies differ (Table 1).

On the basis of genomic and metabolic differences, we propose to elevate the subspecies A. orientalis subsp. lurida to species rank under the name Amycolatopsis lurida sp. nov., comb. nov., following Rule 50a (Lapage et al., 1992). As a consequence of this step, A. orientalis subsp. orientalis loses its status as a subspecies.

Description of Amycolatopsis lurida (Lechevalier, Prauser, Labeda & Ruan 1986) sp. nov., comb. nov.

Amycolatopsis lurida (lu’ri.da. L. fem. adj. lurida pale yellow, sallow).

The description is based on that for A. orientalis and A. orientalis subsp. lurida (Lechevalier et al., 1986), supplemented with data from Wink et al. (2004). White aerial mycelium produces cylindrical, occasionally ovoid conidia in straight to flexuous chains. Spore surface is smooth. Vegetative mycelium branches frequently and appears to zigzag slightly. Yellow on ISP medium 2 and beige on ISP media 3–7. Melanoid pigment is not produced. Growth occurs at 10 °C, but not at 45 °C. Arabinose, citrate, fructose, glucose and mannitol are utilized; raffinose, rhamnose, sucrose and xylose are not. Decomposes casein, hypoxanthine, tyrosine and xanthine; negative for adenine. Decarboxylation of citrate occurs, but is negative for benzoate and mucate. Produces nitrate reductase, urease, aesculinase, gelatinase, esterase lipase (C8), alkaline phosphatase, N-acetyl-β-glucosaminidase, chymotrypsin phosphatase, acid and acetoaminopeptidase; negative for amylase, α-galactosidase, α-fucosidase, α-mannosidase, β-glucuronidase, lysine decarboxylase, ornithine decarboxylase, tryptophan deaminase, indole production, cystine arylamidase and valine arylamidase. H₂S production is negative. Acid is produced from adonitol, arabinitol, cellobiose, dextrin, erythritol, galactose, inositol, lactose, maltose, mannitol, methyl D-glucoside, salicin, sucrose, trehalose and xylose; no acid is produced from raffinose or sorbitol. DNA G+C content is 67 mol%. Additional properties are given in Table 1. Producer of the glycopeptide antibiotic ristocetin, which is active against Gram-positive bacteria and mycobacteria.

Type strain is NRRL 2430T (=DSM 43134T). Isolated from soil.

References


