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 43134^T differs significantly from the type strain of *A. orientalis*, *A. orientalis* subsp. *orientalis* DSM 40040^T, 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 20058^T, AJ400711; *A. orientalis* subsp. *lurida* DSM 43134^T, AJ577997). The two subspecies were not phylogenetic neighbours, with strain IMSNU 20058^T branching adjacent to *Amycolatopsis japonica* DSM 44213^T. RiboPrint patterns of the two type strains, determined with the restriction enzyme *Pvu*II, 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).

Table 1. Utilization of carbohydrates and enzymic activities of strains DSM 40040^T and DSM 43134^T

Strains: 1, *A. orientalis* DSM 40040^T; 2, *A. lurida* DSM 43134^T.

Substrate/activity	1	2
Phosphatase*	+	–
Growth in lysozyme broth*	–	+
Acid from:		
Melibiose*	+	–
Rhamnose*	+	–
Inositol	+	–
Esterase (C4)	+	–
Lipase (C14)	–	+
Leucine arylamidase	–	+
Trypsin	–	+
β-Galactosidase	–	+
α-Glucosidase	–	+
β-Glucosidase	–	+
Arginine dihydrolase	+	–
Urease	–	+

*According to Lechevalier *et al.* (1986). Other data are from Wink *et al.* (2004).

Basonym: *Amycolatopsis orientalis* subsp. *lurida* (ex Grundy *et al.* 1957) Lechevalier *et al.* 1986.

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-glucosamidase, chymotrypsin phosphatase, acid and acetoin; 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, arabinose, cellobiose, dextrin, erythritol, galactose, inositol, lactose, maltose, mannitol, methyl α-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 2430^T (=DSM 43134^T). Isolated from soil.

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