

***Nocardia macrotermitis* sp. nov. and *Nocardia aurantia* sp. nov., isolated from the gut of the fungus-growing termite *Macrotermes natalensis*.**

Benndorf R, Schwitalla JW, Martin K, de Beer ZW, Vollmers J, Kaster AK, Poulsen M, Beemelmans C (2020) *Nocardia macrotermitis* sp. nov. and *Nocardia aurantia* sp. nov., isolated from the gut of the fungus-growing termite *Macrotermes natalensis*. *Int J Syst Evol Microbiol* 70(10), 5226-5234.

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Abstract

The taxonomic positions of two novel aerobic, Gram-stain-positive Actinobacteria, designated RB20^T and RB56^T, were determined using a polyphasic approach. Both were isolated from the fungus-farming termite *Macrotermes natalensis*. Results of 16S rRNA gene sequence analysis revealed that both strains are members of the genus *Nocardia* with the closest phylogenetic neighbours *Nocardia miyunensis* JCM12860^T (98.9 %) and *Nocardia nova* DSM44481^T (98.5 %) for RB20^T and *Nocardia takedensis* DSM 44801^T (98.3 %), *Nocardia pseudobrasiliensis* DSM 44290^T (98.3 %) and *Nocardia rayongensis* JCM 19832^T (98.2 %) for RB56^T. Digital DNA-DNA hybridization (DDH) between RB20^T and *N. miyunensis* JCM12860^T and *N. nova* DSM 44481^T resulted in similarity values of 33.9 and 22.0 %, respectively. DDH between RB56^T and *N.*

takedensis DSM44801^T and *N. pseudobrasiliensis* DSM44290^T showed similarity values of 20.7 and 22.3 %, respectively. In addition, wet-lab DDH between RB56^T and *N. rayongensis* JCM19832^T resulted in 10.2 % (14.5 %) similarity. Both strains showed morphological and chemotaxonomic features typical for the genus *Nocardia*, such as the presence of meso-diaminopimelic acid (A₂pm) within the cell wall, arabinose and galactose as major sugar components within whole cell-wall hydrolysates, the presence of mycolic acids and major phospholipids (diphosphatidylglycerol, phosphatidylethanolamine, phosphatidylinositol), and the predominant menaquinone MK-8 (H₄, ω-cyclo). The main fatty acids for both strains were hexadecanoic acid (C_{16:0}), 10-methyloctadecanoic acid (10-methyl C_{18:0}) and cis-9-octadecenoic acid (C_{18:1} ω9c). We propose two novel species within the genus *Nocardia*: *Nocardia macrotermitis* sp. nov. with the type strain RB20^T (=VKM Ac-2841^T=NRRL B65541^T) and *Nocardia aurantia* sp. nov. with the type strain RB56^T (=VKM Ac-2842^T=NRRL B65542^T).

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