DIVERSITYAND BIOLOGICAL ACTIVITYOF*ACTINOPOLYSPORA*IN ALGERIAN SAHARAN SOILAND DESCRIPTION OFFOURNEW SPECIES, *Actinopolysporaalgeriensis* sp. nov., *A.saharensis*sp. nov., *A.righensis* sp. nov.and*A.mzabensis* sp. nov.

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Abstract:

Theaims of this work were to study the biodiversity of *Actinopolyspora* (*Actinobacteria* halophilic) in Saharan soilsby using a polyphasic approach based on the phenotypic and phylogenetic studies thorough the DNA-DNA hybridization, and also to highlight their potential to produce antimicrobial substances. A total of 16 strains of *Actinopolyspora*were isolated from different soil samples, by a dilution agar plating method, using humic acid-vitamins agar mediumsupplemented with 20% ofNaCl.The taxonomy and biodiversity of the strains were characterized by using a polyphasictaxonomicapproach. Themorphological and chemotaxonomic characteristics of the strains were consistent with those of members of the genus*Actinopolyspora*.All strains were characterized by long spore chains on aerial mycelium and fragmentation of the substrate mycelium. The cell wall of these strains was determined to contain *meso*-diaminopimelic acid (without glycine). The characteristic whole-cell sugars were arabinose and galactose(chemotypeIVA). The predominant menaquinones were found to be MK-10(H_4) and MK-9(H_4). The predominant cellular fatty acids were determined to be anteiso-$C_{17:0}$, iso-$C_{16:0}$ and iso-$C_{15:0}$ (type 2e fatty acid pattern). The diagnostic phospholipid detected was phosphatidylcholine (type PIII phospholipid pattern).

The 16S rRNA gene sequence analysis of four selected strains isolated from soil samples of Ouargla (strains H19 and H23), El-Oued (H32) and Ghardaïa (H55) showed that formed a distinct phyletic line within the radiation of the genus *Actinopolyspora*. Furthermore, the result of DNA–DNA hybridization between each strain and the nearest *Actinopolyspora*species was clearly below the 70 % threshold. Thegenotypic and phenotypic data confirmed that these actinomycetesrepresent four novel species of the genus *Actinopolyspora* forwhich the name *Actinopolysporaalgeriensis*sp. nov., *A.saharensis*sp. nov., *A.righensis*sp. nov.and*A.mzabensis* sp. nov., were proposed, respectively with the type strains H19^T (DSM 45476^T), H32^T (DSM 45459^T), H23^T (DSM 45501^T)and H55^T(DSM 45460^T).

On the other hand, almost all *Actinopolyspora*strains showed an antimicrobial activity against several plant pathogenic, toxigenic or pathogenicmicroorganisms to human.The most active strain (H16)was identified as*A. mortivallis*,which produces five bioactive compounds.These antibioticswere glycosylated polycyclic aromaticcompounds containing amine groups and hydroxamicacids.

Based on the obtained results, the explorationof Algerian Saharan soils is recommended toscreen for rare and new species of microorganisms able to produce newbioactive compounds.

Key words: *Actinopolyspora*, new species, halophilic actinomycete, Saharan soil, bioactive compounds.