Biological ,chemical and numerical taxonomical studies on grey series of streptomycetes from egyption soils

Seham mohamed salama shash

Streptomycetes are considered as a group of microorganisms of very strategicimportance, Since 1964 , an intensive work has been conducting by the supervisor ofthis thesis on the taxonomy and biological activities of streptomycetes isolated fromsoils of Egypt and several new species were described. In view of the fact thatStreptomycete taxonomy has recently undergone revolutionary changes, where newlysuggested biochemical, chemical, genetical and numerical criteria are given moreweight than the traditional morphological or physiological characters, it was thoughtnecessary to redescribe the collection of Streptomycetes obtained from soils of Egypt.The present thesis deals with the redescription of the pigmented isolates ofStreptomycetes belonging to the grey Series, i.e producing grey coloured aerialmycelium. The present work deals with representative pigmented isolates previouslydescribed as well as some newly obtained isolates. The studied Streptomycetes weredifferentiated into the six known colour section : violet, blue, green, brown, red andyellow.The violet SectionGroup one : Isolates of this group produce spiral chains of smooth surface spores,grey aerial mycelium with purple substrate mycelium, diffusible pH sensitive purplepigments, melanin positive, mesophiles, produce antibiotics active against Grampositive bacteria, but sensitive to some antibiotics, show lipolytic, keratinolytic,cellulolytic and chitinolytic activities, degrade some complex compounds, Isolates ofthis group were identified as Streptomyces prunigriseolus, n.sp. Hussein and ELGammal,1973Group two: Isolates of this group produce compact spiral chains of smooth spores,grey aerial mycelium with violet substrate mycelium diffusible pH sensitive violetpigments, melanin positive, mesophiles, produce antibiotics active against Grampositive bacteria, but sensitive to some antibiotics, show lipolytic, keratinolytic,cellulolytic and chitinolytic activities, degrade some complex compounds. Isolates ofthis roup were identified as Streptomyces prunicinereus, n.sp. , Hussein andEl-Gammal, 1973.Group three : The isolate of this group produces spiral chains of smooth surfacespores, grey aerial mycelium with purple substrate mycelium, diffusible pH sensitivepigments, melanin positive, mesophile, produces antibiotics active against Grampositive bacteria but sensitive to some antibiotics, shows lipolytic, keratinolytic,cellulolytic and chitinolytic activities, degrades some complex compounds. The isolateof this group was identified as Streptomyces cinereopurpureus n.sp., Hussein andFahmy, 1986.Comparative study of the fatty

acid composition of the cell wall of the three groupsof the violet section revealed a high common content of the fatty acid C 7.The blue SectionGroup one. Subgroup (a) Isolates of this group produce spiral chains of smoothspores, medium grey aerial mycelium, blue substrate mycelium on starch nitrateagar, but crimson red on fish meal extract agar, pigments are pH sensitive, melaninnegative, mesophiles, produces antigram positive bacteria, sensitive to some antibiotics, show lipolytic, keratinolytic, cellulolytic, pectinolytic and chitiololytic activities, anddegrade some complex compounds. Isolates of this subgroup were identified asStreptomyces rubrocyaneus n.sp., Hussein, 1964.Subgroup (b) The isolate of this group produces spiral chains of smooth surfacedspores, bluish grey aerial mycelium, deep blue substrate mycelium, diffusible pHsensitive blue pigment, melanin negative , mesophiles, does not produce antibiotics,sentsitive to some antibiotics, shows lipolytic, keratinolytic, cellulolytic, pectinolytic,and chitinolytic activities and degrades some complex compounds. The isolate of thisgroup was identified as Streptomyces coelicolor, Muller, 1908.Group two: Subgroup (a): The isolate of this subgroup produces spiral chains ofspiny spores, dark grey aerial mycelium , blue nondiffusible pH sensitive pigment,melanin negative, mesophile, produces antiyeast as well as antibacterial (Grampositive) antibiotics, sensitive to some antibiotics, shows lipolytic, keratinolytic,cellulolytic and chitinolytic activities, degrades some comple compounds. The isolate ofthis subgroup was identified as Streptomyces cinereocyaneus, n.sp- Hussein andShash, 1992.Subgroup (b): The isolate of this subgroup produces spiral chains of spiny spores,bluish grey aerial mycelium, diffusible blue pH sensitive pigments, melanin negative,mesophile produces antibiotics active aginst yeasts and Gram positive bacteria,sensitive to some antibiotics , shows lipolytic, keratinolytic, cellulolytic, pectinolytic andchitinolytic activities and degrades some comples compounds. The isolate of this groupwas identified as Streptonyces caerulatus, Krassilnikov, 1965.Group three :The isolate of this group produces spiral chains of hairy spores,grey aerial mycelium, pH sensitive blue undiffusible pigments, melanin negative,mesophile, produces antibiotics against yeasts and bacteria (Gram positive), sensitiveto some antibiotics, show lipolytic, keratinolytic, cellulolytic, pectinolytic andchitinolytic activities. Degrades some complex compounds. The isolate of this groupwas identified as a new species to which the name Streptomyces cyanotrichosporus,n.sp. ,Hussein and Shash 1992.The comparative study of the fatty acid composition of the cell wall of the groups ofthe blue section showed no common characteristics but on the contrary the fatty acid patternof cell wall is a species character but not in any wasy agroup character.The Green SectionGroup one: Isolates of this group produce spiral chains of smooth spores, greyishgreen aerial mycelium, pale green substrate mycelium,nondifusible not pH sensitive greenpigments, melanin negative, mesophiles, do not produce antibiotics but sensitive to someantibiotics, show llipolytic, keratinolytic, cellulolytic , pectinolytic and chitinolytic activitiesand degrade some complex compounds. Isolates of this group were identified asStreptomyces mutabilis, Gauze et al, 1957.Group two:Isolates of this group produce spiral chains of hairy spores, greymycelium, olive green pigmented substrate mycelium, diffusible not pH sensitive deep bluegreen pigments, mesophiles, melanin negative, produce antiGram positive bacterialantibiotics,

sensitive to some antibiotics, show lipolytic, keratinolytic, cellulolytic, andchitinolytic activities and degrade some complex compounds. Isolates of this group wereidentified as Streptomyces cyanoviridis, Hussein et al 1980.The comparative study of the faty acids of the cell wall of representative isolates ofspecies of the green section did not show any common character for species of this section.The fatty acid pattern of cell wall of these species is a species character.The brown sectionQroup one: Isolates of this group produce spiral chains of smooth surface spores,of the brown section revealed that it serves as a species character but not a section character.mesophile, does not produce antibiotics but sensitive to some antibiotics, show lipolytic,keratinolytic, celluloyltic, pectinolytic and chitinolytic activities, degrades somesomplex compounds. The isolate of this group was identified as Streptomyces rutilosis,krassilinikov, 1970.The yellow sectionGroup one :The representative isolate of this group produces spiral chains ofsmooth surface spores, grey aerial mycelium, yellow substrate mycelium, diffusiblenot pH sensitive pigments, melanin negative, mesophile, produces antibiotics activeagainst Gram negative bacteria,sensitive to some antibiotics, shows lipolytic,keratinolytic, cellulolytic,pectionolytic and chitinolytic activities and degrades somecomplex compounds. This isolate was identified as Streptomyces aureofaciens,Duggar, 1949.Group two:The representative isolate of this group produces spiral chains of wartyspores, grey aerial mycelium with brownish yellow substrate mycelium, nondiffusiblenot pH sensitive pigment, melanin negative, mesophile, produces antibiotics activeagainst Gram positive bacteria, sensitive to some antibiotics, shows lypolytic,keratinolytic, cellulolytic, pectinoltic and chitinolytic activities, degrades some complexcompounds. This isolate was identified as Streptomyces griseoplamus, Backus et al,1957Group Three:The representative isolate of this group produces spiral chains ofspiny spores , grey aerial mycelium with light yellow substrate mycelim, diffusible notpH sensitive yellow pigments, melanin negative, mesophile, produces antibiotics activeagainst Gram positive bacteria and yeasts, but sensitive to some antibiotics , showslipolyic , keratinolytic, cellulolytic, pectinolytic and chitinolytic activities , degradessome complex compounds. This isolate was identified as Streptomyces griseoflavus,(krainsky), Waksman and Henrici,1948.Group four: The isolate of this group produces spiral chains of hairy spores, greyaerial mycelium with pale yellow substrate mycelium, nondiffuisble not pH sensitivepigments, melanin negative, mesophile, produces antibiotics active against Grampositive bacteria and yeast, but sensitive to some antibiotics, shows lipolytic,keratinolytic, cellulolytic, pectinolytic and chitinolytic activities, degrades somecomplex compounds~. This isolate was identified as Streptormyces flavelous ,Waksman, 1919.The comparative study of the fatty acid composition of the cell wall of therepresentative isolates of species of the yellow section showed, that this character is anindividual species character and can not serve as a common character for species ofthe yellow section .