biological chemical and numerical toxonomical studies on series of actinomy cetes from egyption soils

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The present thesis deals with the redescription of a big collection of nonpigmented Streptomycetes of the RED series, isolated from soils of Egypt. This collection includes isolates previously described by other coworkers of Professor Assam M. Hussein. as well as isolates obtained by the authoress of the present thesis. The reason that necessitated this redescription is the international agreement of the inclusion of chemical characters and their priority to morphological markers.The study of the chemical composition of the cell wall of all the studied isolates revealed that they all contain LL-diaminopimelic acid with no characteristic sugar component. These data together with the fact that all isolates produce well developed colonies of non fragmenting aerial and substrate mycelia enabled the identification of all the studied isolates as belonging to the genus Streptomyces.The studied collection includes 98 isolates, that were divided according to the colour of the aerial mycelium into 3 sections:1.Cinnamon section: This includes 15 isolates having cinnamon in colour aerial mycellium.2.Lavender section: This includes 8 isolates havinglavender in colour aerial mycelium.3. Rose section: This includes 75 isolates having rose incolour aerial mycellium.Cinnamon colour means brownish rose; lavender colour means greyish violetish rose; rose colour means yellowish red.Cinnamon SectionThis includes 15 isolates that were divided by their morphological and biological characteristics into three groups:Group one: includes 5 isolates that produce short chains of smooth spores, cinnamon in colour aerial mycelium with nonpigmented substrate mycelium, do not produce melanin pigments, mesophiles, nonacidophiles, growth is inhibited by sodium azide (0.02%) and phenol, assimilate a wide set of carbon sources, do not assimilate xylose, -salicin dextran or sodium oxalate, utilize different nitrogen sources but not L phenylalanine tryptophan or tyrosine, do not produce antibiotics against the used test organisms, resistant to the inhibitory effect of Vancomycin and penicillin G, but sensitive to other 9 used antibiotics, exhibit lipolytic, cellulolytic, pectinolytic and chitinolytic activities, do not degrade guanine, xylan, testesterone, urea andaesculine. On these basis the isolates of this group were identified as a new -species named Streptomyces recticinnamomeus n.sp. (Hussein, Ramadan and El Ayat, 1992).Group two: includes 5 isolates that produce spiral chains of smooth spores, cinnamon in colour aerial mycelium with nonpigmented substrate myceluim, do not produce melanin pigments, mesophiles, nonacidophiles, growth is inhibited

by sodium azide (0.02%) and phenol, do not assimilate xylose, salicin or sodium oxalate, do not utilize L-phenylalanine, tryptophan or alanine, produce antibiotics that inhibit Gram positive bacteria yeasts and fungi, resistant tocephaloridine, vancomycin and penicillin G, exhibitlipolytic and chitinolytic activities, do not degradeguanine, xylan, testesterone or urea. On these basisisolates of group two were identified as SLrepLomyces toxytricini (Preobrazhenskaya et al., 1950).Group three: includes 3 isolates that produce spiral chains of smooth spores, cinnamon in colour aerial mycelium with nonpigmented substrate mycelium, do not produce melanin pigments, mesophiles, nonacidophile, growth is inhibted by sodium azide (0.02%) and phenol, do not assimilate D-xylose, inuline, salicin or sodium oxalate, do not utilize L-phenylalanine, or tyrosine, produce antibiotics that inhibit the growth of Gram positive bacteria, yeasts and fungi, senitive to cephaloridine, vancomycin and penicillin G,exhibit lipolytic, keratinolytic,.cellulolYtic, pectinolytic and chitinolytic activities, do not degrade guanine, tyrosine, xylan, testesterone, or urea. On the basis of the obtained data for isolates of group three they were identified as Streptomyces roseolilacinus (Preobrazhenskaya et al., 1957).Lavender SectionThis group includes 8 isolates that differentiate by their morphological characteristics into three groups as follows:Group four: includes five isolates, that produce long straight chains of smooth spores, spore chains have long straight stalks at the end of which few loose whorls, produce melanin pigments, lavender in colour aerial mycelium with nonpigmented substrate mycelium, mesophiles, nonacidophiles, growth is inhibted by phenol, potassium azide and crystal violet, do not assimilate D-xylose, meso--inositol, L-rhamnose, inulin, salicin and sodium oxalate, do not utilize L-phenylalanine, L-hydroxyproline or tyrosine, produce antibiotics active against Gram negative and Gram positive bacteria, yeasts and fungi, sensitive to rifampicin, cephaloridine, vancomycin and penicillin G, exhibit lipolytic, pectinolytic and chitinolytic activities, do not degrade guanine, elastine, tyrosine, xylan,testesterone or urea. On these basis isolates of group four were identified as Streptomyces lavendulae (Kuchaeva et al., 1962).Group five: includes two isolates that produce extraordinary long chains of smooth spores, produce lavender colour aerial mycelium with nonpigmented substrate mycelium, producemelanin pigment, mesophiles, nonacidophiles growth is inhibited by phenol and sodium azide (0.02%), do not assimilate D-xylose, salicin, cellobiose, sodium acetate and sodium oxalate do not utilize L-phenylalanine, L-hydroxyproline, tryptophan or tyrosine, do not produce antibiotics, sensitive to cephaloridine and penicillin G, exhibit lipolytic, pectinolytic and chitinolytic activities, do not degrade guanine, tyrosine, adenine, tween 80, xylan, testesterone, urea or keratin. On these basis isolates of this group were identified as Streptomyces rectilavendulae (Krassilnikov, 1970).Group six: includes one single isolate that produces long straight chains of smooth spores, produces melanin pigments lavender aerial mycelium, nonpigmented substrate mycelium. mesophile, nonacidophile, growth is inhibited by sodium azide and phenol, does not assimilate D-xylose, inuline, salicin, -dextran, sodium citrate and sodium oxalate does not utilize -amino butyric acid. L phenylalanine, L-hydroxyproline or tyrosine, does not produce antibioticsactive against Bacillus cereus, sensitive to tobramycin, cephaloridine, vancomycin and penicillin G, exhibits lipolytic, pectinolytic and chitintolytic, does not degrade

guanine, tyrosine, adenine, xylan, testesterone or urea. On these bases the isolate of this group was identified as Streptomyces lavendocolor, (Kuchaeva et al., 1962).Rose Sect ionThis section includes 75 isolates that weredifferentiated by their morphological and biological characteristics into 4 groups as follows:Group seven: includes 21 isolates that produce straightchains of smooth spores, light yellowish pink aerialmycelium with nonpigmented substrate mycelium, producemelanin pigments, mesophiles, nonacidophilos, growth is inhibited by phenol, do not assimilate D—xylose, salicin, trehalose and sodium oxalate, do not utilize aminobutyric acid. L—phenylalnine, tryptophan, aspartic acid or tyrosine, produce antibiotics against Gram positive bacteria and yeast, resistant to tobramycin cephaloridine, vancomycin and penicillin G. Exhibit lipolytic, keratinolyticcellulolytic and chitinolytic activities, do not dgrade hypoxanthine, guanine, xylan, testesterone or urea. On these bases isolates of this group were identified as Streptomyces gilvus (Krassilnikov, 1970).Group eight: includes 27 isolates that produce long straightchains of smooth spores, light yellowish pink aerialmycelium with nonpigmented substrate mycelium, do notproduce melanin pigments, mesophiles, nonacidophiles, growth is inhibited by phenol, sodium azide, potassium tellurite 0.01%, do not assimilate D-xylose, salicin, sodium pyruvate, sodium oxalate, do not utilize L-phenylalanine, L-arginine, tryptophan, alanine, leilcine or tyrosine, produce antibiotics against Gram positive bacteria and some fungi, resistant to cephaloridine, vancomycin,dimethylchlrotetracycline, lincomycin and penicillin G, exhibit lipolytic, keratinolYtic, cellulolytic, pectinolytic and chitinolytic activities, do not degrade guanine, elastine, xylan testesterone or urea. On the basis of these characteristics the isolates of this group were identified as Streptomvces pilvoroseus, (Krassilnikov, 1970).Group nine: includes five isolates that produce very long straight chains of smooth spores, greyish yellowish pink aerial mycelium with light olive brown pigments of the substrate mycelium, produce melanin pigments, mesophiles, not acidophiles, growth is inhibited by sodium azide, phenol and potassium tellurite (0.01%), do not assimilate D-xylose, salicin, dextran or sodium oxalate do not utilize L-phenylalanine or tryptophan, do not produce antibiotics, resistant to vancomycin and penicillin G, exhibit lipolytic, cellulolytic, pectinolytic and chitinolytic activities, donot degrade guanine, testesterone, urea, aesculine orkeratin. On these bases isolates of group nine wereidentified as Streptomycese fradiofumosus (Krassilnikov,1970)•Group ten: includes 7 isolates that produce retinaculiapertichains of smooth spores, light yellowish pink aerialmycelium with nonpigmented substrate mycelium, producemelanin pigments, mesophiles, not acidophiles, growth isinhibited by phenol, do not aassimilate D—xylose, inuline, salicin, trehalose, sodium citrate, sodium oxalate or sodium tartarate, do not utilize L—phenylalanine, L—histidine, tryptophan or aspartic acid, produce antibiotics active against Gram positive bacteria, sensitive to rifampicin, cephaloridine, vancomycin, and penicillin G, exhibit lipolytic, pectinolytic and chitinolytic activities, do not degrade guanine, elastin, tyrosine, tween 80, xylan, testesterone, aesculine, chitin or keratin. On these bases isolates were found to differ from described species of genus Streptomyces and hence they was declared as a new species to which the name Streptomyces incarnatus n.sp Hussein and El—Ayat, 1992, was given.Group eleven: includes 15 isolates that produce spiral

chains of smooth spores, yellowish pink aerial mycelium with nonpigmented substrate mycelium, do not produce melanin pigments, mesophiles, not acidophiles, -growth is inhibitedby phenol, sodium azide and crystal violet, do notaassimilate D xylose, inuline, salicin, sodium citrate, sodium pyruvate, sodium oxalate and -ammonium tartarate, do not utilize -amino butyric acid, L-phenylalanine and L hydroxyproline, do not produce antibiotics, resistant to tobramycin cephaloridine, vancomycin and penicillin G, exhibit lipolytic, keratinolytic, cellulolytic, pectinolytic and chitinolytic activities, do not degrade guanine, elastine, xylan, testesterone or urea. On these bases isolates of group eleven were identified as Streptomyces vinaceusdrappus (Shirling and Gottlieb, 1969).