Detection, Characterization and Partial Purification of Polyene Antibiotics Produced by Streptomyces sp. Active Against Candida albicans.

by

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Abstract

Detection, characterization and partial purification of polyene antibiotics produced by Streptomyces SP. active against Candida albicans.

During the year 1995 339 viable Streptomyces isolates have been chosen to carry out this study. It has been found that aerial mycelium (mature) were different in colors; gray and white constitute the highest frequency (35.4% and 30.4% respectively). 90.6% of all isolates had the ability to produce distinctive reverse side pigment. Concerning Streptomyces isolates that were able to produce soluble pigments in the media, 79.9% of all bacterial isolates were soluble pigment producers. The number of active isolates against Candida albicans on solid media was 39 (11.5%). The color of these active isolates was yellow (38.9%) white (21.4%) gray (5%) and brown (4.9%). While isolates that didn't show sporophore color had the percentage of 5.9%. When the isolates were grown in broth media the number of active isolates against Candida albicans
was 11 (3.2%) in comparasion with solid media. Inhibition zone diameter was considered as an indicator for antibiotic activity in both solid and broth media. Inhibition zone values differ; milky white and white show the highest IZ value on solid media (2, 2.3cm respectively). In broth the highest inhibition zone value was for isolates number 196, 158, 22, 294.

It has been found that media composition affected antibiotic production. Some media were specially ideal for certain isolates while other media were general for all isolates of *Streptomyces*.

The best carbon source utilized by bacteria for antibiotic production was starch at a concentration of 30g/L and the best nitrogen source was casein 1g/L. The color of *Streptomyces* media changed at certain starch and casein concentration. pH is of great importance for the growth and antibiotic production, the best PH for growth and antibiotic production lies between 6-7.5.
Butanol was the best solvent for antibiotic extraction from the fermentation broth. Extracted antibiotics were not affected by treatment at 95°C but lost their activity completely or partially at 100°C. The best antibiotics that resisted heat were those isolated from isolate #196 that quickly produced antibiotics after 2 days of incubation, besides it had the capability for production at pH range 6-9, and coloring the media (which facilitate the study). It had the ability to produce 5 different antibiotics with different colors and R_f values; which were soluble in chloroform and ethanol. After characterization using H-NMR and FT-IR; they were found to be organic compounds composed of similar chemical groups. Amoxicillin and Cefodroxyl R_f resemble antibiotic number 5 while ampicillin and cefalexin had R_f similar to that of isolated antibiotic number 6.