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FACTORS FAVORING SYNTHESIS OF ANTIBIOTIC ROSEOFLAVIN IN STREPTOMYCES DAVAWENSIS

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Streptomyces is a genus of Gram positive bacteria that grows in various environments, and its shape resembles filamentous fungi. The most interesting property of Streptomyces is the ability to produce bioactive secondary metabolites such as antifungals, antitumoral, antivirals and mainly antibiotics and immunosuppressives (Pedrolli et.al. 2014). The Gram-positive bacterium Streptomyces davawensiswas were first isolated from a Philippine soil sample. The species name refers to the site of sampling, which was near Davao City in the Philippines (Jankowitsch et.al. 2012). S. davawensis was found to produce a compound which exhibited antibiotic activity against Bacillus subtilis, Staphylococcus aureus or Bacillus cereus. Due to its red color and its structural similarity to riboflavin (vitamin B_2), the novel antibiotic was named roseoflavin. Roseoflavin (RoF) is synthesized in bacterial cells from riboflavin (vitamin B_2) by 8 consecutive reactions. It is taken up by many bacteria via riboflavin transporters. Roseoflavin is natural derivative of riboflavin which serves as precursor of flavin nucleotides FMN and FAD participating as coenzymes in numerous enzymatic, mostly oxidoreductive, reactions. Instead of this, roseoflavin, in which methyl group in 8th position is substituted by dimethylamino group, has quite different physic-chemical and biological properties as it is pink to rose color non-fluorescent substance with strong antivitamin activities (Hemberger et.al 2011). Roseoflavin is very active against Gram-positive bacteria including Staphylococcus aureus, however, it is rather toxic for humans.

Aim of this study was evaluation of S. davawensis growth on different media and growth conditions as well as production of roseoflavin by those bacteria.

At first, five different media were checked: TSB, oat extract, corn flour extract, Starch-YE medium and basial inorganic medium with added carbon source (starch). After selection of the best media (Starch- YE medium, oat extract) different carbon sources were checked. In this part authors checked; starch, sucrose, glucose, mannose and maltose. Beside evaluation of color changes during cultivation also dry biomass of bacteria was measured. The best growth was observed on medium with starch as a carbon source 6.65 g/L dry biomass. Similar results was observed in medium with sucrose as a carbon source 6.55 g/L. Additionally Red color in those cases shows that roseoflavin was produced by S. davawensis strain.