Studies on the Antibiotic Substances from Actinomyces.

(7th Report)

By

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As already reported in our previous works, we have found 360 active strains by "streak plate methode," among which 15 strains were selectively inhibitory upon acid fast bacteria.

Among these 15 strains Streptomyces No. 364 was most active, so the author have made efforts to clarify the nature of this active agent. By the mycological study this strain seems to belong Str. aureus. For the production of this agent surface culture in modified Waksman medium containing 1 per cent glycerol seems most suitable and all the media used for shaking culture were not suitable. Active filtrate was evaporated in vacuo at pH 5.0, dried, and extracted by anhydrous methanol 3 times repeatedly. When 10 volumes of butanol was added to the methanol solution, inactive brownish residues were precipitated and active agent remaining in supernatant was concentrated and precipitated by additions of 10 volumes of acetone. Then the active precipitate was dessicated upon P₂O₅ and dissolved again in methanol and precipitated by acetone. Whitish yellow powder thus obtained were active against Mycob. phlei and Mycob. tuberculosis (human type). Crystalline helianthate was obtained from this powder, which decomposed at 243–247°C, and showed the same antibiotic specificity as above. After decomposing this crystals at pH 4.0 by conc. HCl, the hydrochloride of the active principle was obtained which showed the dilution potency of 1: 640,000 to 1: 1,280,000 to Mycob. phlei, 1: 10,000 to 1: 60,000 for Mycob. smegmatis, 1: 160,000 for Mycob. avium, and 1: 100,000 to 1: 200,000 for Mycob. tuberculosis, human type. When the crude substance and purified hydrochloride were injected in doses of 10–20 mg. into mice both intramuscularly and intravenously, they lived healthy over 2 weeks, and not showed any toxic symptoms.