Studies on the Antibiotic Substances from Actinomyces.

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By

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In this laboratory many streptothricin-like basic substances, effective against a number of gram-negative organisms, were isolated, so the present studies were undertaken to examine the activities of these substances against H. pertussis in vitro and against experimental murine pertussis, being compared with those of streptomycin and “colistin” which was supplied from Kobayashi Pharmaceutical Co., Ltd. “Colistin” is an aerosporin-like substance produced by a spore-forming bacteria and purified by the same method with that of aerosporin.

Materials: As basic substances from Actinomyces, Nos. 36, 20, 259 substances and “Seki” substance were used. The former two belong to so-called streptothricin type 1 (ST1), characteristic in their low toxicity, in relatively low inhibitory action and in good diffusibility, while the latter two belong to so-called streptothricin type 2 (ST2), characteristic in their high inhibitory action, in relatively high toxicity and in less diffusibility. All these substances were used as HCl-salt.

Results: 1) Against 6 strains of H. pertussis, these substances were effective in vitro in the following order; colistin, streptomycin, “Seki” substance, No. 259, No. 36 and No. 20 substances. The susceptibility of H. pertussis to streptomycin and streptothricin-like substances was nearly the same with that of E. coli, while the former organism were more susceptible to colistin than E. coli.

2) For the experimental infection in mice, both intranasal and intracerebral inoculation methods were used. The former method needed relatively thick suspension of organisms, in order to kill all control animals within 5 days, while the latter method required a relatively small number of organisms, to cause the death of animals within 9 days. Using both these methods it was clearly shown that streptomycin and “Colistin” definitely protect against the experimental infection.