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1 (1748)

Further studies on the nature of botulinus toxin.

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In trying to duplicate in vitro the conditions as they exist when botulinus toxin is taken by the mouth, we have observed that the acidity equal to that of the stomach contents not only leaves the toxicity of botulinus toxin undiminished, but would actually increase its potency. It has been repeatedly stated in the literature that botulinus toxin resists action of acids, but so far as we know nobody has observed the increase in potency of this toxin resulting from the change in its hydrogen ion concentration.

In attempting to establish the extent of this increase in potency we found that under the suitable conditions of the experiment the botulinus toxin which ordinarily kills mice in amounts not smaller than 3×10^{-7} cc. can be increased in potency to such an extent that 3×10^{-21} cc. occasionally and 3×10^{-18} cc. quite regularly kills mice of 18–20 grams in less than 48 hours after the intraperitoneal injection. While the total solids of such a minute dose of toxin amount to only 3×10^{-23} grams (this amount including also the inorganic portion of the medium) the toxic product thus obtained, nevertheless, possesses all the essential characteristics of bacterial toxins: it is thermolabile, it acts only after an incubation period, it reproduces in experimental animals typical symp-

toms of the botulinus poisoning and it exhibits strict specificity in its neutralization with the homologous antitoxin.

Our studies, thus far, were limited to the toxin produced by a single strain of *Bacillus botulinus*, but the experiments are in progress to determine whether the observation can be extended to toxins produced by other strains of *Bacillus botulinus* as well as to toxins of other bacteria.

This work is a part of the investigation of food poisoning, conducted under the direction of Dr. M. J. Rosenau, professor of preventive medicine and hygiene, Medical School of Harvard University. The investigations are made under the auspices of the Advisory Committee on the Toxicity of Preserved Foods of the National Research Council, and under a grant of the National Canners' Association.

2 (1749)

Some plant sources of vitamins B and C.

By FRANCISCO O. SANTOS.

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Several plant foods were tested for their content of vitamins B and C. Togi (sprouted mongo), okra, and avocado were found to be comparatively high in vitamin B. One half gram of each of them as daily supplement to the standard vitamin B free diet caused the recovery in weight of rats which had been declining because of lack of this accessory food factor. Mongo, sweet potato leaves and duhat (*Eugenia jambolana*) contain enough vitamin so that one gram of each of them as daily supplement caused the recovery in weight of rats which had been declining due to lack of vitamin B. Artichokes, bilimbi (*Averrhoa carambola*), banana flower bud and bamboo shoots are relatively poor in vitamin B.

The vitamin B in mongo was increased in germination, a fact contrary to the finding of Grijns that the antiberi-beri vitamin is lessened in amount as germination takes place.

Mongo is relatively poor in vitamin C. Togi when fresh is relatively rich in vitamin C; but after it is prepared for culinary use, the vitamin C is destroyed.