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Short Communication

CLOSTRIDIUM BOTULINUM IN THE SOIL OF PARAGUAY

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SUMMARY: Seventeen soil samples of Paraguay were examined for the presence of *Clostridium botulinum*. Botulinum type A, C₁ and F toxins were detected in soil cultures. Type E toxin was not detected in any of soil cultures including those from river and lake shores.

Clostridium botulinum is indicated to be a worldwide inhabitant of soil (1). A few investigations of the distribution of the bacterium, however, have been conducted on the soil of South America (1). Since we fortunately obtained some soil samples of Paraguay, South America, in which country no investigations seemed to have been attempted, we examined the samples for the presence of the organism.

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Fig. 1. Location of sampling sites in Paraguay. ●, sampling site; ★, Asuncion (the capital of Paraguay). A soil sample at the site 18 was exceptionally collected in Brazil. Lakeside soil was sampled at the site 7 and riverside soil at the sites 12 and 13. Soil of grass fields was sampled at the other sites.

Seventeen soil samples of Paraguay were collected in 1986 from soil at a depth of 10 cm. The location of sampling sites at distances of 20 to 260 km is illustrated in Fig. 1. Five 1-g portions of each soil sample were inoculated into tubes containing 10 ml of chopped meat-glucose medium (2), which was incubated anaerobically at 30 C for 5 days. These cultures were examined for the presence of botulinum toxins according to the methods of Yamakawa et al (3).

Botulinum toxicity was found in cultures of the soil at four (24%) of 17 sites. Type A toxin was detected in one of five cultures from the soil at the site 2 and C₁ toxin in one culture from the soil at the site 17. Type F toxin was detected in two and three cultures from the soil at the sites 6 and 9, respectively. From the site 18 soil, which was exceptionally collected in Brazil, type B and F toxins were detected in two different cultures. All these toxin-positive samples were collected from grass fields.

In Argentina types A, B, F and G have been found (4-6). In this study, type F was demonstrated in both Paraguay and Brazil, the neighbor countries of Argentina, although the numbers of soil samples from the former and the latter were only 17 and one, respectively. The results seem to indicate the prevalence of type F in these districts of South America.

Type E, which is more frequently demonstrated in soil samples from the river or the lake (1), was not demonstrated, although at the sites 7, 12 and 13 soil samples were collected at the shores of a river or a lake. This result agrees with the description that type E has not been found in the southern hemisphere (1).

The soil samples were imported by one of the authors with the permission of the Minister of Agriculture, Forestry and Fisheries.

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