スベスベマンジュウガニから分離したテトロドトキシン産生細菌の同定

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Short Paper

Identification of a Tetrodotoxin-producing Bacterium Isolated from the Xanthid Crab *Atergatis floridus*

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Recently we have demonstrated that a bacterium which was isolated from a xanthid crab *Atergatis floridus* and tentatively identified as *Vibrio* sp., produced tetrodotoxin (TTX) and anhydrotetrodotoxin (anhydroTTX), and suggested that bacteria are at least one of the origins of this toxin.[1] Since then, TTX-producing bacteria have also been isolated from a puffer *Fugu vermicularis vermicularis*[2] and a starfish *Astropecten polyacanthus*[3] and were both identified as *Vibrio alginolyticus*. Another TTX-producer was isolated from a calcareous alga *Jania* sp. and tentatively identified as *Pseudomonas* sp.[4] In this situation, the present study was undertaken to identify *Vibrio* sp. S-173, the main strain of the TTX-producing bacteria from the intestines of xanthid crab *A. floridus*.[1]

Strain S-173 was essentially characterized by techniques described in the Manual of Methods for General Microbiology.[5] Incubation was performed on PYBG medium[6] at 25°C, unless otherwise specified.

The strain was a facultatively anaerobic, chemoorganotrophic, and non-sporeforming Gram-negative bacterium.

The cells were rod-shaped in the logarithmic phase of growth, the sizes being about 0.9–1.1 by 1.7–4.1 μm. They occurred singly or in chains, and were motile by means of flagella. The cells were not homogeneous in respect of morphology of flagella: Most cells with a bunch of 2–12 flagella at one pole, some cells with a single flagellum at one pole (monotrichate), rather few cells with a single flagellum at the opposite pole (lophotrichate), or with a single flagellum at each pole plus a lateral flagellum.

Surface colonies of strain S-173, grown on PYBG agars at 25°C for 3 days, were circular, entire, smooth, yellow and 1–2 mm in diameter. They emitted no fluorescence and luminescence, and did not swarm on a PYBG agar. They formed green colonies on a TCBS agar (Eiken).

This strain produced oxidase and catalase; fermented glucose without gas production; was sensistive to the vibrio-static agent (O/129); produced acids from cellobiose, fructose, galactose, glucose, glycerol, maltose, mannitol, mannose and trehalose; did not produce any acid from arabinose, erythritol, inositol, melibiose, rhamnose, ribose, salicin, sorbitol, sucrose and xylose; did not produce arginine dihydrolase and ornithine decarboxylase; produced lysine decarboxylase; reduced nitrate to nitrite; did not produce indole, and acetoin and/or diacetyl; did not utilize L-tyrosine, β-alanine, L-α-alanine, D-α-alanine, L-arginine, L-aspartate, L-citrulline, glycine, L-proline, L-serine, L-leucine, L-glutamate, L-threonine, L-ornithine, ethanol, propanol, D-gluconate, propionate, heptanoate, DL-malate, pryruvate, *p*-hydroxybenzoate, acetate, butyrate, isobutyrate, isovalerate, caproate, caprylate, pelargonate, succinate, fumarate, L-tartrate, aconitate, N-acetylglucosamine, malonate, benzoate and hippurate; did not hydrolyze starch, gelatin and chitin but hydrolyzed Tween 80 and lecithin; grew in broths containing 0.5 to 7% NaCl; and grew at 4 to 30°C.

As described above, strain S-173 agreed well with *Vibrio fischeri* in many properties, except that it did not produce any acid from ribose, grew at 4°C, did not utilize L-proline, succinate, fumarate and N-acetylglucosamine.[7] The possibility can not be excluded that this strain is a new species of *Vibrio*. At present, however, it seems reasonable to identify the microorganism as a *Vibrio fischeri*-like bacterium.

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