

## VIBRIO PARAHAEMOLYTICUS IN SEAWATER OFF THE PACIFIC COAST OF PANAMÁ\*

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**Abstract.** The presence of *Vibrio parahaemolyticus* in Panamá is reported. It was recovered from seawater off the Pacific coastline and in the channel of the Panama Canal. This is the first time this organism has been isolated in Panamá.

The purpose of this report is to record the recovery of *Vibrio parahaemolyticus* from seawater in Panamá. To our knowledge, this organism has not been reported from Central or South America.

*Vibrio parahaemolyticus*, an enteropathogenic Gram-negative halophilic bacterium is the major etiologic agent of acute gastroenteritis in Japan and has been found widely distributed in the coastal seawaters of Japan, the Philippines, Taiwan, Hong Kong, and Singapore.<sup>1</sup>

Recently, in the United States, this same organism has been reported as the etiologic cause of common-source gastroenteritis outbreaks from Atlantic, Pacific, and Gulf Coast States, and from Hawaii.<sup>2</sup> Vibrios were isolated from patients' stool specimens and from a variety of seafoods such as the Chesapeake Bay blue crab<sup>3</sup> and shellfish from the Pacific Coast.<sup>4</sup>

Recognition of *V. parahaemolyticus* as a potential pathogen in the diarrheal diseases of Panamá became a major concern to us since surveys of enteropathogens carried out in this country have revealed a low prevalence of the commonly sought enteropathogens.<sup>5-7</sup> We were prompted to investigate the presence of *V. parahaemolyticus* to see whether or not some of the undifferentiated cases of diarrhea could be attributed to this organism. We began our bacteriological assessment of seawater fish, shellfish, and other marine food from the Pacific Coast of Panamá. All diarrheal cases that came to our attention were also promptly investigated for the presence of this vibrio.

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### MATERIALS AND METHODS

We sampled seawater from the Bay of Panamá, along a section of coastline which included the channel at the Pacific entrance to the Panama Canal, and offshore sites along the coast up to 25 miles to the west of the Canal. Samples were also taken within the Canal and at the Balboa Yacht Club where small pleasure craft are anchored. There was no consistent pattern in the sampling except that the samples were taken at random, at a depth of about one foot, and at distances of 100 to 1,000 yards from shore. The particular coastal area which was surveyed and the approximate sampling sites are shown in Figure 1.

Water samples were collected in sterile bottles and brought to the laboratory on the day of collection. Aliquot parts of the samples were streaked onto thiosulfate-citrate-bile-salts-sucrose agar (TCBS) and inoculated in double-strength glucose salt Teepol broth (GSTB). After incubation of the broth at 37° C for 18 hours, a second set of TCBS agar plates were streaked with aliquots of the broth and incubated. All plates were examined 24 and 48 hours after incubation for typical blue-green small colonies. Isolation and identification of colonies suspected of being *V. parahaemolyticus* followed the procedures outlined by the United States Food and Drug Administration.<sup>8</sup>

### RESULTS AND DISCUSSION

Samples of seawater were collected from 20 sites; 6 were found positive for *V. parahaemolyticus*. Five of 6 strains isolated hemolysed rabbit erythrocytes; all 6 failed to break down sucrose. The organisms were further identified according to morphological and biochemical characteristics and subsequently were confirmed by the Center for Disease Control, Atlanta, Georgia.

All but one of the vibrio isolates were recovered

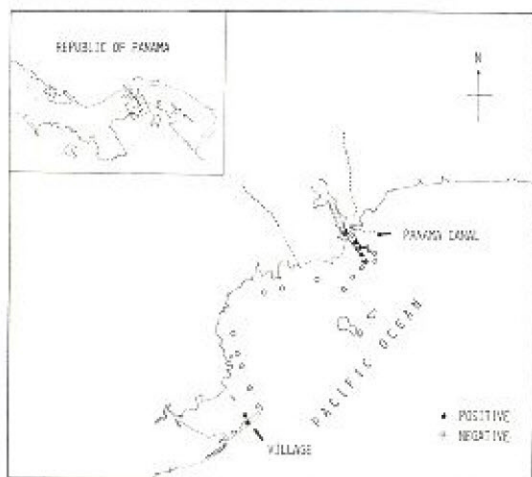


FIGURE 1. Section of the Pacific coastline of Panamá showing sampling sites; solid circles indicate areas where *V. parahaemolyticus* was recovered, open circles where it was not.

from waters within the channel or near the approaches to the entry and exit of the Panama Canal, including the water at the dock of the Balboa Yacht Club. The single culture not isolated in or near the Canal, was recovered 100 yards offshore, in front of a small village, 25 miles west of the Panama Canal (Fig. 1).

Infections by *V. parahaemolyticus* are uncommon in the Western Hemisphere, but cases and outbreaks of diarrhea in North America caused by this organism have become more common in recent years. This is due to an increased awareness of the role and danger of this vibrio as a pathogen in shellfish and fish-related gastroenteritis, its wide geographic distribution in the marine environment, and the availability of newer specific media and better screening methods to detect this organism in the laboratory.

This report confirms the presence of *V. para-*

*haemolyticus* in Panamá and adds one more geographic area to the list of places in which this organism is now known to occur.

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#### REFERENCES

1. Sakazaki, R., 1965. *Vibrio parahaemolyticus* a non-choleraenic enteropathogenic vibrio. *Proceedings of the Cholera Research Symposium*, Honolulu, Hawaii, U.S.P.H.S. Pub. No. 1328, pp. 30-34.
2. Center for Disease Control, 1973. Surveillance summary: *Vibrio parahaemolyticus* gastroenteritis—United States, 1969-1972. *Morbidity & Mortality Weekly Rep.*, 22: 231-232.
3. Krantz, G. E., Colwell, R. R., and Lovelace, E., 1969. *Vibrio parahaemolyticus* from the blue crab *Callinectes sapidus* in Chesapeake Bay. *Science*, 164: 1286-1287.
4. Barker, W. H., Jr., Hooper, D., and Baross, J. A., 1970. Shellfish-related gastroenteritis. *N. Engl. J. Med.*, 283: 319.
5. Kourany, M., and Vásquez, M. A., 1969. Enteropathogenic bacteria associated with diarrhea among infants in Panamá. *Am. J. Trop. Med. Hyg.*, 18: 930-935.
6. Kourany, M., Vásquez, M. A., and Mata, L. J., 1971. Prevalence of pathogenic enteric bacteria in children of 31 Panamanian communities. *Am. J. Trop. Med. Hyg.*, 20: 608-615.
7. Kourany, M., and Vásquez, M. A. A survey to assess potential human disease hazards along proposed sea-level canal routes in Panamá and Colombia. VI. Survey of enterobacterial pathogens in man. *Milit. Med.* (In press.)
8. Food and Drug Administration, U.S. Department of Health, Education and Welfare. 1969. *Bacteriological Analytical Manual*, 2nd ed. U.S. Government Printing Office, Washington, D. C.