

A survey of *Vibrio cholerae* O1 and O139 in estuarine waters and sediments of Beira, Mozambique

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Abstract

This study determined whether the estuarine and freshwater environment in Beira, Mozambique, serves as a reservoir of *Vibrio cholerae* O1 and O139. Ninety-nine estuarine water samples were collected at 6 sites in Beira. An additional 54 samples were collected from rural areas around Beira which included 3 freshwater lake samples, 15 river, 5 pond, and 4 estuarine water samples, and an equivalent number of sediment samples, collected from the same sites as the water samples. In addition, fish scales from 5 ocean fish and 1 deep sea water sample were also collected. The samples were analysed for the presence of *V. cholerae* O1 and O139 using culture methods, the direct fluorescent antibody (DFA) method and polymerase chain reaction (PCR) using a single-primer pair for the ompW gene and a semi-nested PCR selecting for the ctxA gene, encoding subunit A of cholera toxin. DFA results showed 37 *V. cholerae* O1- and 6 O139-positive samples. *Vibrio cholerae* O1 and O139 were observed on the scales of 4 of the 5 fish. The findings of the study provided *in situ* evidence for *V. cholerae* O1 and O139, predominantly as viable but non-culturable cells in the aquatic environment of Beira. This is the first record of the presence of *V. cholerae* O139 in the estuarine environment on the coast of Africa.

Keywords: *Vibrio cholerae* O1, *Vibrio cholerae* O139, water quality, estuary, PCR, DFA