

CHAPTER I

INTRODUCTION

Isolation of Campylobacter spp is difficult because of the competitive growth of the other enteric organisms. The probable reason for inability to isolate this organisms from water is the methodology of isolation because they were designed to detect these organisms in the feces of ill individuals as well as Salmonella or Shigella spp. who shed 10^6 to 10^9 cells per gram of stool, concentration (Blaser et al. 1980). These methods then are not sensitive enough to detect small numbers of Campylobacter spp in large volume of water. The modified methodology is needed for the isolation of Campylobacter spp from the contaminated water (Doyle and Roman 1982, Steele and McDermott 1984, Franson et al. 1985) At present the methods for isolating low number of Campylobacter spp. from the large volume of unclean water are not yet standardized and must be considered as the research procedures.

Diarrheal diseases are a major health problem and one of the most important causes of morbidity and mortality, particularly among young children in the most developing countries. In Africa, Asia and also in Latin America, infants under 5 years of age are the victim of the diseases and Merson 1982, WHO scientific activities 1982).

In Thailand diarrheal diseases, primary from dehydration are being a major hazard problem, they are one of the most important causes of morbidity and mortality among young children. Consequently, chronic diarrheal diseases also contribute greatly to malnutrition in children not only their intake of food is greatly reduced during diarrheal episodes, but also the body's ability to absorb nutrients is decreased (Black et al. 1984, Lolekha and Vibulbandhikit 1985, Purksarach 1989). During the period of 1978 - 1983, a total of 1,979, 118 cases of diarrheal diseases were reported to the National Disease Surveillance System, the Ministry of Public Health. The annual incidence steadily increased from about 400 per 100,000 population in 1978 to over 1,000 in 1983. (Phonboon et al. 1986).

Up to now diarrheal diseases are caused by several types of microorganisms including bacteria, viruses and parasites. One of the most important bacterial causes of infectious diarrheal diseases is Campylobacter spp. Campylobacter jejuni (C. jejuni) is now recognized as a leading causes of invasive diarrhea and gastroenteritis in human (Bruce et al. 1977, Skirrow 1977, Blaser et al. 1979, Pai et al. 1979, Lexomboon 1989). The other Campylobacter spp. that have been associated with diarrheal disease include C. coli, C. laridis C. fetus, "C. hyointestinalis", "C. cinaedi", C. fennelliae", "C. upsaliensis" and C. cryaerophila (Benjamin et al. 1983, Harvey and Greenwood 1983, Karmali and Skirrow 1985, Totten et al. 1985, Fennell

et al. 1986, Edmonds et al. 1987, Simor and Wilcox 1987, Minet et al. 1988, Tee et al. 1988, Lastovica et al 1989, Walmsley and Karmali 1989). The modes of transmission to human include contacting animals, handling raw chicken, spread from person to person and consumption of contaminated food, raw milk and water (Blaser et al. 1978, Grant et al. 1980, Blaser et al. 1981, Mentzling 1981, Blaser et al 1982-a, Vogt et al. 1982, Hopkins and Scott 1983, Palmer et al. 1983, Potter et al. 1983, Taylor et al. 1983). It is true that there is a vast animal reservoir of these organisms. They are in the intestine of a wide variety of wild, domestic mammals and fowl (Grant et al. 1980, Luechtefeld et al. 1982, Blaser et al. 1983-a, Tirapat et al. 1985). It is found that infected person and many kinds of animals have been shown to shed these agents in their feces therefore contaminated water may have the potential to harbour C. jejuni or C. coli or other Campylobacter spp. The contamination may persist for a period of time since these organisms have been reported to remain viable in the water up to 5 weeks (Blaser et al. 1980-a). The contaminated water has been shown to be a vehicle for transmission to humans of Campylobacter infection, either in large outbreaks or in sporadic cases although the organism could not be isolated from the incriminated water sources (Mentzling 1981, Vogt et al. 1982, Blaser et al. 1983-a, Palmer et al. 1983, Sacks et al. 1986) with the exception of the study of Taylor et al. (1983) and Knill et al. (1982).

The objectives of this thesis are primarily develop culture and isolation method for detection of Campylobacter spp. from large volume of water sample. Secondly, to study the incidence of C. jejuni and other Campylobacter spp. from canals in Bangkok Metropolitan Area by using the modified procedures. The 100-ml water sample is concentrated using 0.2 um- membrane filter and enriched in Doyle's medium overnight. Then the Doyle'd medium is subcultured by dropping on the 0.45 um-membrane filter on BBA, further identification will be followed. Finally, the pattern of biotypes and serotypes of the isolated C. jejuni will be studied thoroughly. The findings may clarify the mode of transmission for Campylobacter spp. as the waterborne diarrheal disease and may be the goal for the more effective control measure in the future.