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EXAMINATION OF TELEBRALIA SPP. AND TELESCOPIUM SP ., FROM THE DARWIN FORESHORES, FOR SALMONELLA AND E.COLI

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1.00 INTRODUCTION

Mangrove creepers belonging to the class Gastropoda were examined quantitatively for Escherichia coli, and qualitatively for Salmonella. The work was undertaken in conjunction with the Darwin Institute of Technology.

2.00 SAMPLE COLLECTION

Gastropods - Terebralia pelustris, Terebralia sulcata and Telescopium telescopium - were collected by Officers of the Darwin Institute of Technology from the mangroves of the Darwin Foreshores (see figure 1). Eight samples were collected on two dates (see table 1).

3.00 METHODOLOGY

The shells of the gastrodpods were immersed in alcohol and passed over a flame. All equipment used was disinfected.

The shell was cracked, and the animal removed and weighed. It was transferred to a blender and 150 ml of buffer solution added. This was blended until the mixture was homogenous.

3.1 Escherichia coli Enumeration

The 5 x 10 mL, 5 x 1 mL and 5 x 0.1 mL multiple tube method was used to determine the E.coli concentration. Aliquots of the 150 ml homogenous solution were innoculated into lactose broth and incubated at 44.5° C for 18 - 24 hours. Gas producing cultures were confirmed by innoculation into brilliant green bile broth and tryptophane broth. Gas production/indole production positive cultures were recorded as E.coli. From the MPN tables and the sample weight, the number of E.coli per gram wet weight was determined.

3.2 Qualitative Salmonella Determination

The remaining solution was made up to 200 ml 1% peptone broth, and incubated at 37° C for 18 - 24 hours. One millilitre of culture was innoculated into each of 10 ml Rappaports broth and 10 ml tetrathionate broth. After incubation at 37° C for 18 - 24 hours, the broth cultures were streaked onto each of hektoen enteric agar and brilliant green agar. Salmonella colonies were confirmed biochemically by innoculation into lysine iron agar and urea broth. Lysine decarboxylase positive/urease negative cultures were confirmed by agglutination tests using polyvalent O and polyvalent H sera. Positive cultures were serologically identified by the Institute of Medical and Veterinary Science, Adelaide.

4.00 RESULTS AND DISCUSSION

The E.coli and Salmonella data are presented in Table 2. An E.coli MPN of 4 per 100 mL was determined from one sample, all other samples yielded a MPN concentration of 0 per 100 mL. Salmonella was detected in one sample.

Salmonella lohbrugge was isolated from Telebralia palustris, using both enrichment broths and selective agars, This serotype has been isolated from surface waters of the Darwin environs, and is tentatively classified as indigenous (Reference 1). The serotype is of minor human epidemological importance. The serotype was not isolated in the Northern Territory during the National Surveilence Scheme for Salmonella data collection period 1 January 1982 to September 30 1983.

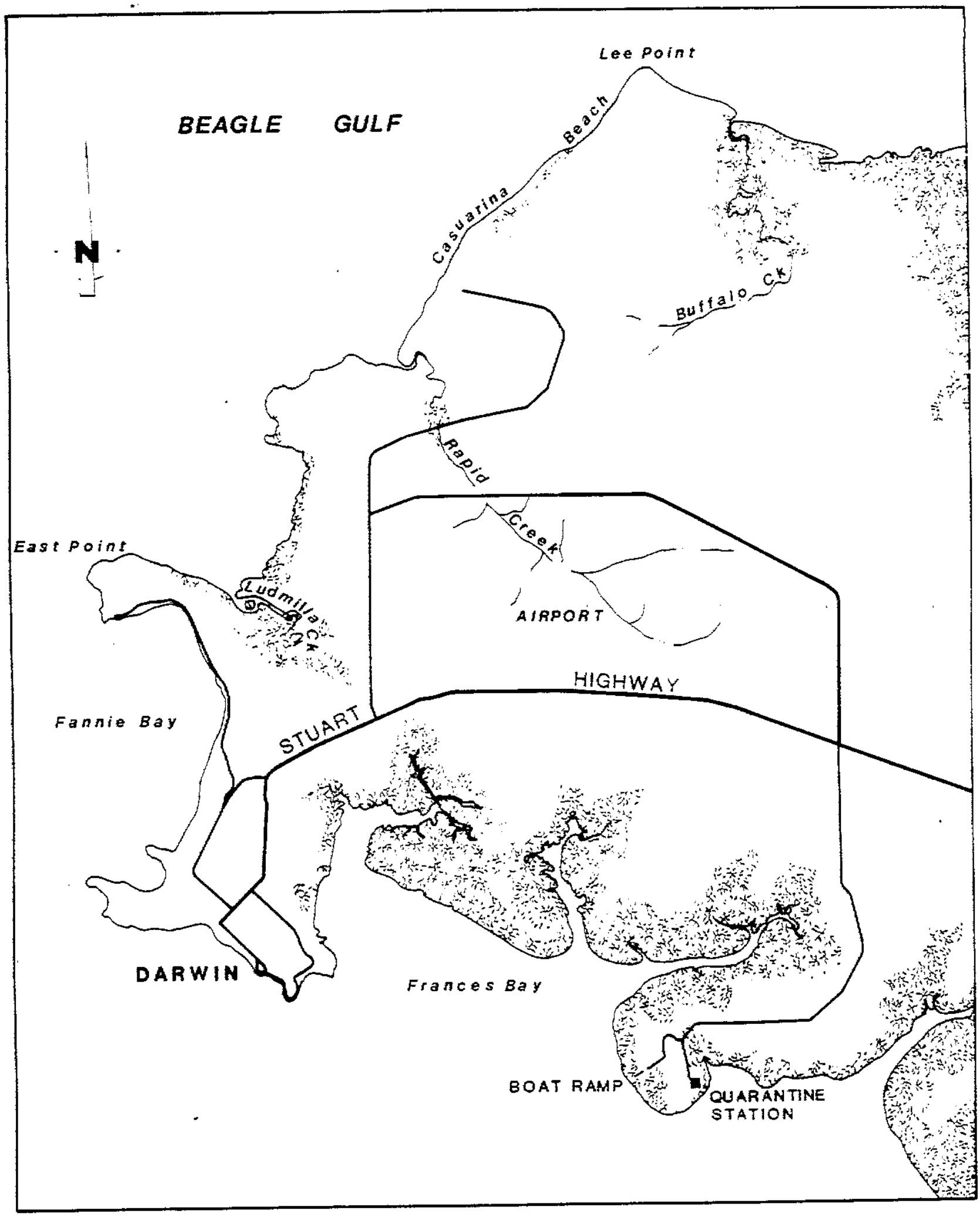
The gastropods examined are detrital feeders of mangrove sediments. The sediments comprise principally of silt, clay and organic matter. Bacteria interact with sediment particulates in two ways: (1) sorption of collodial materials onto the surface of bacteria. This can provide protection of bacteria from parasites. (ii) sorption of bacteria onto particulate surfaces.

The animals ingest not only organic matter, but also sediment particulates and associated bacteria. The isolation of Salmonella, and E.coli is of significance in terms of the potential of these animals to provide evidence of the bacteriological quality of the estuarine water.

The mangrove creepers are an Aboriginal food resource. The animals are roasted, which should destroy all pathogenic bacteria. The quality of other estuarine foods could be of concern, in particular the filter feeders (eg. mussels, oysters) which can concentrate micro-organisms and are usually eaten raw.

5.00 REFERENCES

1. TOWNSEND, S.A. The Occurrence of Salmonella in Surface Waters of Darwin and it's environs. Department of Mines and Energy (1985)



DARWIN FORESHORES

Fig. 1

TABLE 1

SAMPLE COLLECTION DATA

SAMPLE DATE	SAMPLE LOCATION	SAMPLE DETAIL	SAMPLE NUMBER
23.8.83	Ludmilla Creek	Terebralia sulcata	1
	Rapid Creek	2 x Telescopium telescopium	2,3
	Buffalo Creek	Telabralia palustris	4
	Quarantine Ramp	Telebralia palustris	5
3.11.83	Rapid Creek	Telebralia palustris	6
	Ludmilla Creek	2 x Telescopium telescopium	7,8

TABLE 2

E.COLI AND SALMONELLA DATA

SAMPLE NUMBER	WET WEIGHT (g)	MPN E.COLI PER GRAM (WET WEIGHT)	SALMONELLA PRESENCE	SEROTYPE
1	4.53	0	ND	
2	11.91	0	ND	
3	8.06	4	ND	
4	1.02	0	ND	
5	10.48	0	ND	
6	5.11	0	+	lohbrugge
7	3.07	0	ND	
8	3.36	0	ND	

ND = NOT DETECTED.