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ANIRUDDHA JHA
SUMIT HOMECHAUDHURI *

Department of Zoology,
University of Calcutta,
35 Ballygunge Circular Road,
Kolkata 700 019, India

*For correspondence
e-mail: sumithomec@yahoo.com

Parasite-induced vibriosis in *Chirocentrus dorab* off Parangipettai coastal waters

Aquatic microbes cause infection in fishes. The entry and establishment of pathogenic microbes are facilitated through the injuries caused by parasitic infestation. *Aeromonas punctata* was reported to have infected the fish secondarily at the site where the parasite *Argulus* sp. was attached¹. *Lernaea* sp. and isopod parasite have been reported to introduce the virus causing dermal tumours in fishes². The copepod parasite *Ergasilus* sp. was reported to be the etiological agent for a bacterial disease in fishes³. The trematode parasite *Gyrodactylus avalonia* was identified to carry pathogenic bacteria into fishes¹. The infection of isopod parasites in fishes is scanty and no such studies have been made in India. Hence, the present attempt was made to study the incidence of bacterial infection in the fish, *Chirocentrus dorab*, and the causative agent that facilitates the secondary infection by bacteria was identified.

In the routine observation of *C. dorab* fishery in the Parangipettai Fish Landing Centre, an interesting incidence of isopod parasitization was observed in several fishes. The isopod parasite was identified to be *Nerocila phaiopleura*. The incidence of parasitic attachment was maximum in the branchial and shoulder region of the parasitized fishes. At the site of parasitic attachment, skin lesion was observed in all the parasitized fishes. The lesioned sites were red in colour and devoid of scales. Microbiological study was made after removing 1 g of the lesioned skin from parasitized fish. The

tissues excised out from the parasitized (host) fish were separately homogenized with sterilized sea water and subjected to further microbiological testings.

One ml of the serially diluted samples was taken for estimation of total heterotrophic bacteria (THB), *Vibrio* and fungi using the plating technique. THB was enumerated using Zobell marine agar, *Vibrios* using thiosulphate citrate bile-salts sucrose agar (TCBS) and fungi using 2% malt extract agar (MEA). The total counts were expressed as colony forming unit/gram (CFU/g). Different colonies of *Vibrios* isolated were repeatedly streaked for purity and stored in nutrient agar slants under refrigeration. Identification of *Vibrios* was carried out by Parker and Smith method⁷.

In the parasitized fish, THB load was higher. The THB count in the branchial region was significantly ($P < 0.001$) higher than the shoulder region. The presence of

two species of *Vibrio* strain, *Vibrio parahaemolyticus* and *V. anguillarum* was noted. The total *Vibrio* count in the branchial region of the attached parasite was $12 \pm 0.4 \times 10^3$ CFU/g. The body surface where the parasite attached had a *Vibrio* count of $9.2 \pm 0.35 \times 10^3$ CFU/g (Table 1; Figures 1 and 2).

The attachment of the parasitic isopod *N. phaeopleura* on *C. dorab* paved the way for entry of pathogenic microbes into the attachment sites. The pathogenic microbes and parasite could damage the physiological and reproductive activities of the host fish^{4,5}. In the present study both THB and total *Vibrio* counts were higher in the host's branchial region than in the shoulder region. Thus a regional difference for the proliferation of microbes was observed. The higher *Vibrio* and THB counts in the branchial region could be due to the severity of lesion at this site, as was reported in the fish Creole

Table 1. Mean THB count and *Vibrio* count in the different regions of parasitized fish *Chirocentrus dorab* (total of 5 samples for each region)

Source	Branchial	Body surface
THB count (10^3 CFU/g)	32 ± 0.5	21 ± 1.2
SE	0.02	0.01
P	> 0.01	> 0.01
<i>Vibrio</i> count (10^3 CFU/g)	12 ± 0.4	9.2 ± 0.32
SE	0.01	0.03
P	> 0.001	> 0.001

SE, Standard error; P, Level of significance.
CFU/g, Colony forming unit/gram.



Figure 1. *Nerocila phaiopleura* on *Chirocentrus dorab*.



Figure 2. Lesions due to *N. phaiopleura* on *C. dorab*.

parasitized by *N. acumunata*⁶. Also the contamination of this area more frequently by the respiratory water current that carries bacteria along with food particles, could have enhanced bacterial invasion. The bacterial invasion in the branchial region reduces the respiratory area by clubbing and fusion of gill lamellae and affects respiration as well as excretion of nitrogenous wastes⁶.

Two species of *Vibrio* isolated from the parasitic lesions, *V. anguillarum* and *V. parahaemolyticus*, were reported to be potential fish pathogen by previous workers⁷⁻¹². Hence the *Vibrio* count at the parasitic lesion may affect the fish population as vibriosis is communicable. So far *V. parahaemolyticus* had been isolated mainly from the crustacean prawn and from cultivable marine fishes¹³⁻¹⁵.

The present study of the incidence of *V. parahaemolyticus* from *C. dorab* is a report from commercially important captured fishes in Indian waters.

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S. RAVICHANDRAN^{†,*}
A. J. A. RANJIT SINGH[‡]
N. VEERAPPAN[†]

[†]Centre of Advanced Study
in Marine Biology,
Annamalai University,
Parangipettai 608 502, India

[‡]Department of Biology,
Sriparamakalyani College,
Alwarkurichi 627 412, India

*For correspondence
e-mail: aucasmb@md4.vsnl.net.in