Research Communication

The Leech Batracobdelloides Tricarinata (Blanchard, 1897) (hirudinea: glossiphoniidae) as a possible reservoir of the rainbow trout pathogenic streptococcus species

R. R. Bragg(1), J. H. Oosthuizen(2) and Shirley M. Lordan(1)

Abstract


A Streptococcus species biochemically and serologically identical to the rainbow trout pathogenic Streptococcus species was isolated from the internal organs of the fish specific leech, Batracobdelloides tricarinata. These leeches were obtained from Roodeplaat Dam, near Pretoria, in which rainbow trout do not occur. This is the first isolation of this bacterium from an environmental source not related to rainbow trout and it is proposed that this leech is a possible reservoir of the rainbow trout pathogenic Streptococcus sp. in South Africa.

Introduction

Streptococcosis of rainbow trout was first diagnosed in South Africa in 1974 (Boomker, Imes, Cameron, Naudé & Schoonbee, 1979) and today it is probably the most serious disease of rainbow trout in South Africa (Bragg, Todd & Lordan, 1989a). Failure of antimicrobials to control a well established episode of streptococcosis (Bragg & Broere, 1986; Bragg, 1988; Bragg et al., 1989a) has led to the exploration of other avenues of control. One approach is to try and identify vectors or reservoirs in the environment and try to eradicate these or at least prevent their entry into production ponds.

Batracobdelloides tricarinata was fortuitously identified as a possible vector or reservoir of the rainbow trout pathogenic Streptococcus sp. This leech has been found to be highly specific for freshwater fishes and has been found to feed readily on the sharptooth catfish (Clarias gariepinus), Mozambique tilapia (Oreochromis mossambicus) and goldfish (Carassius auratus) (Oosthuizen, 1989). This is a preliminary report on investigations of B. tricarinata as a possible vector or reservoir of the rainbow trout pathogenic Streptococcus sp.

Materials and Methods

Samples of B. tricarinata were collected from Roodeplaat Dam, near Pretoria in sterile glass bottles. A total of 20 individuals were collected and divided into those which had fed recently and breeding (non-feeding) adults to ascertain if there were any differences in the microflora of fed and unfed individuals. A total of 14 fed and 6 unfed leeches were obtained. Ten fed and 4 unfed leeches were each homogenised separately in 2 ml sterile phosphate buffered saline (PBS). The homogenates were used to inoculate 14 bottles containing nutrient broth at a pH of 9.6 which had been supplemented with 160 μg/ml oxolinic acid (Bragg, Todd, Lordan & Combrink, 1989b). The bottles were all incubated at room temperature for 48 h and then plated onto tetrazolium agar and incubated for a further 48 h (Bragg et al., 1989b). All small red colonies on the tetrazolium agar were isolated onto blood tryptose agar (BTA) plates and serologically and biochemically identified (Bragg, 1988).

The remaining individuals were each placed into bottles containing nutrient broth at a pH of 9.6, which had been supplemented with 160 μg/ml oxolinic acid. These samples were processed according to the method described above.

Results

A Streptococcus sp. biochemically and serologically (Bragg, 1988) identical to the trout pathogenic species was isolated from all of the homogenised samples of fed and unfed leeches. No Streptococcus spp. could be isolated from the surface of the leeches.

Discussion

There is no record of this leech feeding on rainbow trout (Salmo gairdneri), but the fact that the leech readily feeds on at least three fish species and not on aquatic invertebrates indicates a wide host range amongst fish (Oosthuizen, 1989). The geographical distribution of B. tricarinata in Southern Africa indicates that the leech is very wide-spread in the Transvaal but is absent in the trout waters of Natal and the Western Cape. This distribution corresponds with the reported incidence of trout streptococcosis (Bragg, 1986; 1987, unpublished data).

The failure to isolate the Streptococcus sp. from the surface of the leeches indicated that the Streptococcus sp. is possibly part of the natural gut microflora of B. tricarinata. It is thought that leeches lost the capacity to produce digestive enzymes during their evolution and this deficiency is compensated for by enzymes produced by symbiotic gut microflora (Jennings & Van der Lande; 1967; Sawyer, 1986). It is possible that this Streptococcus sp. performs this function in B. tricarinata.

The isolation of this Streptococcus sp. from the internal organs of B. tricarinata may be significant in the epidemiology of streptococcosis. There is no possibility that infected trout contaminated the leeches due to the fact that trout do not occur in Roodeplaat Dam. This is the first isolation of this Streptococcus sp. from a site not associated with rainbow trout and it would thus appear that the rainbow trout pathogenic Streptococcus sp. is not an obligate pathogen of rainbow trout. A similar Streptococcus sp. was isolated from the mud and a dead
THE LEECH AS A POSSIBLE RESERVOIR OF THE RAINBOW TROUT PATHOGENIC STREPTOCOCCUS SP.

Fresh water crab on a site with a history of streptococcosis (Bragg et al., 1989a) but the significance of these isolations is questionable due to the fact that rainbow trout were stocked in this water source (Bragg et al., 1989a).

As the leech has not yet been recorded to feed on rainbow trout, this will have to be established whereafter experimental work will be required to prove that leeches, carrying this bacterium can produce streptococcosis in rainbow trout.

REFERENCES


