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ANTIBIOTIC SUSCEPTIBILITY OF WOUND INFECTION CAUSATIVE AGENTS OF *POTAMOTRYGON LEOPOLDI* (CASTEX & CASTELLO, 1970)

Skin ulcer microbiota of stingray *Potamotrygon leopoldi* was identified and its antibiotic susceptibility was detected. Isolated strains belonged to *Shewanella algae* and *Citrobacter freundii* and showed high resistance to 25 of 34 used antimicrobials.

Key words: stingray, wound infection, antibiotic susceptibility.

Introduction

Potamotrygon leopoldi is an endemic freshwater stingray restricted to the Xingu River Basin in Brazil. It is seldom taken for food but juveniles enter the ornamental fish trade due to the attractive colour pattern. The species faces persecution in some areas due to fear of sting injuries [2]. Although most cases are related to the riverside population in the natural environment of stingrays growing popularity of this fish as an aquarium inhabitant increases the risk of accidents at home. The local injury caused by these stingrays is due to mechanical penetration of the sting into the tissue and subsequent release of venom leading to the development of local edema, necrosis, intense local pain and cases of secondary infection [3].

To date, normal microbiota of *Potamotrygon leopoldi* has not been studied. Data about possible causative agents of infectious diseases of this species is also absent. However, any representative of stingray microbiota can cause severe tissue infection of human. In addition, there are no known means for treatment of any kind of infection in these animals themselves. Taking into account their high cost as ornamental fish information about effective antimicrobials can be very valuable for aquarists.

Objective

The objective of this study was to detect antibiotic susceptibility of two bacterial strains isolated from skin ulcer of *Potamotrygon leopoldi* female kept in aquarium.

Materials and methods

Sterile swabs were used for isolation of microorganisms from damaged stingray's skin. Petri plates with nutrient agar were then inoculated with obtained material and incubated overnight at 28 ℃ in the dark and during next 48 h in the light at room temperature. Isolated strains were identified by classical bacteriological methods and using API systems. Antibiotic susceptibility of cultures was detected by disk-diffusion method.

Results and discussion

Two different cultures of motile rod like Gram negative bacteria were isolated from skin ulcer on *Potamotrygon's* tail. Isolated strains were identified as *Shewanella* algae and *Citrobacter froundii* on the basis of their morphological, cultural, physiological and biochemical properties. Both species are rarely associated with human diseases. However, some strains of *C. freundii*, which is a part of normal gut microbiome, have been associated with opportunisitic nosocomial infections of blood, respiratory and urinary tract in immunocompromised patients [5]. Also, reports of *Shewanella* infections have been increasing [1, 4].

Taking into account mixed nature of skin infection we performed drug susceptibility test for isolated consortium of bacteria to estimate their mutual influence (table 1).

It was found that isolated microorganisms possessed high level resistance to 25 of 34 used antibiotics. Only levomycetin, levofloxacin, tetracycline, cefoperazone, ceftriaxone and cefixime were able to inhibit the growth of bacteria effectively.

The activity of meropenem, nalidixic acid and cefotaxime was estimated as moderate (table 1).

Conclusion

1. *Potamotrygon leopoldi* kept as an ornamental aquarium fish can be a potential origin of human infections caused by multi-resistant bacteria.

2. Cefalosporins, fluoroquinolones, tetracyclines and levomycetin can be considered potential chemotherapeutical means for treatment of skin ulcers of *Potamotrygon leopoldi* in aquarium conditions and also of human infections caused by contact with this species.

Table 1

Antibiotic sensitivity of isolated consortium of bacteria

№	Antibiotic	Result (growth inhibition zone. mm)
1	Azlocillin	R
2	Amoxycillin/clavulanate	R
3	Ampicillin	R
4	Ampicillin/sulbactam	R
5	Amphotericin B 40 μg	R
6	Amphotericin B 100 μg	R
7	Benzilpenicillin	R
8	Vancomycin	R
9	Carbenicillin	R
10	Clarithromycin	R
11	Clindamycin	R
12	Ketoconazole	R
13	Clotrimazole	R
14	Levomycetin	S (28)
15	Levofloxacin	S (16)
16	Lincomycin	R
17	Meropenem	RS (12)
18	Nalidixic acid	RS (10)
19	Nistatin	R
20	Oxacyllin	R
21	Penicillin	R
22	Rifampicin	R
23	Tetracycline	S (16)
24	Teicoplanin	R
25	Fluconazole	R
26	Ceftazidime	R
27	Cefotaxime	RS (11)
28	Cefoperazone	S (28)
29	Cefuroxime	R
30	Cefepime	R
31	Ceftriaxone	S (18)
32	Cefazoline	R
33	Cefixime	S (17)

Note: R – resistant, I – intermediate (moderately sensitive), S – sensitive

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