

# Nocardiosis in *Clarius batrachus* collected from the Bittan market of Bhopal

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**Abstract:** Nocardiosis is a systemic chronic granulomatous disease of fish caused by specie of bacterium Nocardia. Severe emaciation, inactivity and skin discoloration are the clinical signs of this disease. In advanced stages cachexia, ascites, dermal ulceration, focal necrotic areas with in skeletal muscles and pale areas in the swollen kidney, spleen, heart and liver may be observed. About 10 to 30 *Clarias batrachus* infected with Nocardiasis were morphologically and bacteriologically analyzed. Nocardia appeared filamentous, branched and beaded on Drossetts egg and Lowerstein-jensen media at 20-30°C temperature.

**Keywords:** Nocardiasis, *Clarias batrachus*, focal necrosis, cachexia, ascites, dermal ulceration.

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## I. INTRODUCTION

Nocardiosis is a disease of both saltwater and freshwater fish caused by actinomycetes of genus Nocardia. This bacterium was first identified by Valdez and Conroy in 1963. Same condition was also reported by Snieszko *et al.*

In 1964 in rainbow trout. Despite differences in acid fast staining reactions, colony morphology and growth temperature range.

## II. MATERIALS AND METHODS

Incidences of Nocardiasis were recorded from Oct-Feb 2007-2008 from Bittan fish market of Bhopal. A total of 30 fishes were collected and brought to the laboratory both live and dead. Samples were taken aseptically from liver, skin, kidney, gills, ulcers and lesions. These samples were inoculated on non selective agars i.e. nutrient agar, brain heart infusion agar, Trypticase soy agar and selective agars viz. Drossetts egg and Lowerstein-jensen media incubated at 20-30°C temperature. Development of colonies took place after 4-5 days as ridged, folded, irregular, pinkish white colonies. Identification were done by various biochemical tests viz. Gram's reaction, incubation temperature, acid fast, motility, growth at 10°C temperature, production of catalase, H<sub>2</sub>S production, indole, oxidase, nitrate reduction, production of acid from fructose, glucose and glycerol.



Fig. Showing *Clarias Batrachus* Suffering from Nocardiosis

### III. RESULTS

It was observed that *Nocardia* spp. has a rapid growth ranging from 3 to 7 days. Morphology varies from branched filamentous cell to a fragmented, irregularly shaped, pleomorphic or coccobacillary cell. They appear in coccoid to oval forms and as long as slender multicapsulate rods.

**Table 1.** Showing biochemical characterization of *Nocardia* species isolated from *Clarias batrachus*

S.no.	Characteristics	
1	Colony morphology	Chalky appearance
2	Gram reaction	+ve rods
3	Growth on nutrient agar	+ve
4	Drosette – egg medium	+ve
5	Motility	+ve
6	Acid fast test	+ve
7	Oxidative/Fermentative	O
8	Oxidase production	-ve
9	Catalase	+ve
10	Indole	- ve
11	H <sub>2</sub> S production	-ve
12	Urease production	- ve
13	Methyl red	- ve
14	Voges Proskauer reaction	-ve
15	Ornithine	- ve
16	Lysine	- ve
17	Arginine	- ve
18	Production of acid from glucose	
19	Lactose	-ve
20	Dextrose	+ve
21	Glucose	+ve
22	Maltose	-ve
23	Fructose	+ve
24	Sucrose	+ve
25	Xylose	-ve

**Table 2:** Showing presence of *Nocardia* sp. in following organs of *Clarias batrachus*.

Bacteria	Skin	Gills	Muscles	Intestine
<i>Nocardia</i> sp.	10.5 x10 <sup>3</sup> CFU/g	7.5 x10 <sup>3</sup> CFU/g	10.0x10 <sup>3</sup> CFU/g	7.5x10 <sup>3</sup> CFU/g

#### IV. DISCUSSION

**Nocardia sp.** was dominant on the skin ( $10.5 \times 10^3$  CFU/g), gills ( $7.5 \times 10^3$  CFU/g), muscles ( $10.0 \times 10^3$  CFU/g) and intestine ( $7.5 \times 10^3$  CFU/g) of *Clarias batrachus* suffering from Nocardiosis. These observations are in conformity with that of Snieszko *et al.* (1964), Kubota *et al.* (1968), Hettiarachchi and Cheong (1994), Calhoun (2001), Haley *et al.* (1967), Hsu *et al.* (1987) and Valdez and Conroy (1962).

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