SHARK SPOILAGE BACTERIA

BY

N. K. VELANKAR AND P. V. KAMASASTRI

Reprinted from "Current Science", August 1955, 24, 272-273.

Reprinted from "Curr. Sci.", August 1955, 24, 272-273

SHARK SPOILAGE BACTERIA*

WHILE the bacterial flora associated with spoilage of teleosts has been extensively studied, elasmobranch spoilage flora has received little attention. Wood,[2] who investigated the bacteriology of shark spoilage, found the spoilage flora differing significantly from that of teleosts. He found that in the sharks there was no succession in the bacterial genera during spoilage; there was also a marked difference in the ratio of genera and species associated with teleosts and elasmobranchs respectively. In shark spoilage enrichment of certain genera, particularly gram-positive types, occurs, this being different from teleost spoilage where gram-negative types predominate in the later stages.[1,3] In the light of these findings our observations on bacteria isolated from spoiling shark muscle appear to be of interest.

A number of bacterial strains were isolated from twelve shark samples (*Scoliodon* spp.) allowed to spoil at room temperature (27-30° C.) for 24 hours. With the exception of one (a *Micrococcus candidus* strain) all the isolates were gram-negative rods (Table I). None of the isolates produced any pigment and most of the strains required sea-water for satisfactory growth especially in liquid media. Gram-positive asporogenous rods of the *Corynbacterium* group which were found occurring abundantly during shark spoilage studies by Wood (162 out of 266 total isolates being Corynbacteria), were conspicuously absent in the flora isolated by us. Apparently enrichment of gram-positive types, if any, were present initially, had not occurred. Wood found Corynbacteria commonly occurring in estuarine muds in Australia, and since sharks are bottom feeders the presence of these bacteria in the shark muscle during spoilage is only to be expected. In a study of the bacterial flora of the inshore environment at Mandapam carried out by one of us,[4] Corynbacteria were not encountered. These observations incidentally stress the significance of the bacterial flora of the environment of the living fish as a source of the spoilage bacteria.

It is interesting to record here that in contrast with our observations on shark spoilage flora, in our studies on teleost spoilage occurring at room temperature we found aerobic sporeformers, *i.e.*, *Bacillus* as the dominant type.

The relatively high concentration of urea in elasmobranch muscle, about 2% in the case of shark, might exert a selective action on the development of the spoilage flora.

Central Marine Fisheries Research Station, Mandapam Camp,
N. K. VELANKAR.
P. V. KAMASASTRI.

June 27, 1955.

TABLE I

Types of bacteria isolated from spoiling shark muscle

Type	No. of strains	Description	Nitrate reduction	Gelatin liquefaction	B.C.P. Milk	Dextrose	Lactose	Hydrogen sulphide production	Ammonia from Urea
I	4	Gram-negative, motile, short rods; show bipolar staining	+	–	No change	Acid & gas	Acid only	–	+
II	1	do (Sometimes long chains present)	+	–	do	do	do	–	–
III	1	Gram-negative, actively motile, medium rods	+	+ (24 hrs.)	peptonised	–	–	++++ (24 hrs.)	+++
IV	1	Gram-negative, short rod & coccoid cells. Non-motile	+	+	Acid; curdled	Acid only	–	–	+
V	2	do	+	+	Alkaline; peptonised	do	–	+	+
VI	3	do	+	+	do	do	–	–	–
VII	6	do	+	+	No change	do	–	–	–
VIII	8	Gram-negative, short rods, in chains and singles. Motile	+	+	peptonised	do	–	–	–
IX	1	Spherical cells, in pairs and clusters. Gram-positive. Non-motile	Identified as *Micrococcus candidus*						

* Published with the permission of the Chief Research Officer, Central Marine Fisheries Research Station, Mandapam Camp.

1. Wood, E. J. F., *C. S. I. R.*, Australia, Pamphlet No. 100, 1940.
2. —, *Aust. J. Mar. Freshw. Res.*, 1950, 1, 129.
3. —, *Ibid.*, 1953, 4, 160.
4. Velankar, N. K., *Indian J. Fisheries*, 1955, 2, 96.