

FLORIDA STATE BOARD OF CONSERVATION

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**BLACK DISCOLORATION IN SHRIMP**

by

C. P. Idyll

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Because of repeated inquiries to the Marine Laboratory concerning the cause of black discoloration in shrimp, an investigation was made into its causes. The appearance of this type of discoloration is of concern to fishermen and dealers since it causes sales resistance. Prospective buyers tend to assume that the abnormal appearance of the shrimp may denote spoilage or an inferior quality product.

The dark color appears most often at the outer edge of the segments of the abdomen, or "tail," giving the shrimp a striped appearance when discoloration is severe. In unheaded shrimp the gill chambers, legs and other parts of the cephalothorax or "head" are also darkened. Unheaded shrimp tend to show more discoloration than those headed on the grounds.

The black discoloration is not a normal pigment. It is usually restricted to the exoskeleton, or shell, and to the membranes connecting the shell segments. Erosion of the exoskeleton is common, and in extreme cases breakdown of the underlying muscle has been observed. The damage is apparently not due to mechanical action.

In April, 1950, the first sample of discolored shrimp was sent to the Marine Laboratory from Key West. These were the pink grooved shrimp, *Penaeus duorarum*, the only species caught in the area. Other specimens have been received at various times since then.

Examination of slides prepared from the black regions on these shrimp revealed two types of bacteria.\* These may be normally present on shrimp, however, or may have been introduced by handling. No massive colonies of bacteria were apparent, as would be expected if the black spots were caused by bacterial action. It appears therefore that bacteria are not the cause of the condition.

Agar plate cultures were prepared in order to investigate the possibility of a fungus giving the cause. No fungus spores or mycelia showed on these cultures, so that it is improbable that these organisms are concerned in the discoloration. The plates developed two colonies of bacteria only.

It is possible that the color is due to a breakdown of the blood of the shrimp. A similar discoloration sometimes appears in lobsters, due to the change in color of the blood on exposure to air.

Freshly caught shrimp rarely, if ever, exhibit the discoloration. It is only after holding, in ice or frozen, that the black color appears on the shrimp. It appears that carelessly stored shrimp

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\* Bacterial examination was made by Mrs. L. B. Fly of the Department of Botany. Dr. Ernest Reynolds examined the shrimp for fungus.

show a much higher incidence of discoloration. Catches that are carefully washed before storage in the hold, and which are covered with plenty of ice are less affected than those not treated in this manner.

The black color does not appear to affect the quality of the shrimp as food. Discolored shrimp have been eaten, and have shown no alteration in flavor. Peeling the shrimp in preparation for cooking removes the color, since it affects only the shell in almost all instances.

It is therefore concluded that consumers need have no hesitation in using shrimp discolored in this manner. Producers are advised that, since the cause may be darkening of blood following exposure to air, the most likely method of prevention is to head and thoroughly wash the shrimp in clear seawater as soon after catching as possible.