



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

INTERNATIONAL JOURNAL  
OF CURRENT RESEARCH

International Journal of Current Research  
Vol. 15, Issue, 11, pp.26502-26504, November, 2023  
DOI: <https://doi.org/10.24941/ijcr.46264.11.2023>

## RESEARCH ARTICLE

### EFFECT OF CONTAINING BIOGENIC AMINES ON DEEPWATER SHRIMP- A REVIEW

\*Sweetline, C.

Department of Microbiology, New Prince Shri Bhavani Arts and Science College, Chennai- 600021,  
Tamil Nadu, India

#### ARTICLE INFO

##### Article History:

Received 20<sup>th</sup> August, 2023  
Received in revised form  
27<sup>th</sup> September, 2023  
Accepted 15<sup>th</sup> October, 2023  
Published online 28<sup>th</sup> November, 2023

##### Key words:

Shrimp, Fish,  
Amines and Seafood.

##### \*Corresponding author:

Sweetline

Copyright©2023, Sweetline. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Sweetline, C. 2023. "Effect of containing biogenic amines on deepwater shrimp- a review". *International Journal of Current Research*, 15, (11), 26502-26504.

#### ABSTRACT

Many animals from other orders include the word "shrimp" in their common name even though they are not true shrimps. The phrases "shrimp" and "prawn" are frequently used synonymously in daily speech or to refer to creatures based on size rather than species. According to science, true prawns belong to the suborder Dendrobranchiata, but true shrimps are species found in the infraorder Caridea in the suborder Pleocyemata. Both are members of the Decapoda order. The structure of the gills is the fundamental distinction between prawns and shrimps; shrimps have lamellar gills whereas prawns have branched gills. The main factor in fish rotting throughout its storage time is microorganisms. Despite several references to gilthead sea bream's quality and shelf life in the literature, no statistics are available.

## INTRODUCTION

The shrimps are found worldwide in freshwater, brackish water, and saltwater. They belong to the infra order Caridea in the order Decapoda. Currently, there are roughly 2000 described species in the order. Many animals from other orders include the word "shrimp" in their common name even though they are not true shrimps. The phrases "shrimp" and "prawn" are frequently used synonymously in daily speech or to refer to creatures based on size rather than species. According to science, true prawns belong to the suborder Dendrobranchiata, but true shrimps are species found in the infraorder Caridea in the suborder Pleocyemata. Both are members of the Decapoda order. The anatomy of the gills is the primary distinction between shrimps and prawns; shrimps have lamellar gills whereas prawns have branched gills (Biswas, 1996) Up to 80% of the nation's fish and seafood exports are still made up of prawns, but there is still a lot of unrealized potential because only 1.75 million of the projected 4.5 million tonnes of resources in the waters surrounding India are being used. 1.38 million tonnes per year are caught through inland fisheries. The second segment at the abdomen of prawns (caridea), which have two pairs of claws, overlaps the pair on either side. There was a noticeable caridean bend in the abdomen. About half of all crustaceans belong to the class Malacostraca. The primitive body plans of the individuals in this class, which consist of a 5 - 8 - 7, might be compared to prawns. They have a strong belly for swimming and a tiny carapace that covers their head and thorax. In order to preserve their small weight, they also have a thin exoskeleton. All members of the class share these universal traits (William, 2022).

Seafood often has low fat, cholesterol, and calorie content. They are also an abundant source of omega-3 fatty acids and polyunsaturated fats, which are thought to actively combat heart disease (Mopper *et al.*, 1994). Diets for weight loss or weight maintenance should include seafood. It has a lot of protein and is simple for the body to chew and digest. Since it is a wonderful source of so many vital nutrients, it is a delightful addition to any meal. But it's crucial to consider the seafood's quality while handling and processing it (Clifford *et al.*, 1991). Similar to other seafood, prawns is low in food energy but high in calcium, iodine, and protein. A shrimp-based meal is also a significant source of cholesterol, ranging from 122 mg to 251 mg per log of shrimp, depending on the method of preparation. Consuming shrimp, however, is regarded as healthy for the circulatory system because shrimp don't contain any appreciable amounts of saturated fat, so their high cholesterol content actually helps to improve the LDL to HDL cholesterol ratio and reduce triglycerides. Seafood products competed with those from other, technologically more developed nations in the Indian market and still do. Every time, the purchasers insisted on goods with superior physical and organoleptic qualities as well as sound microbiological traits. This implies the requirement for a quality control system to guarantee the consistency and wholesomeness of the quality of processed goods.

## REVIEW OF LITERATURE

Review of literature rings into light the ideas and postulates of various scholars, researchers, scientists and writers concerning the particular

study. In this chapter, the literature pertaining to sea food processing, their quality system, malacostraca and their characterization, nutritional composition of shrimp and their health aspects are reviewed and discussed under the following subdivision.

- Prevalence of malacostraca
- Common features of Malacostraca
- Nutritional importance of seafood and shrimp
- Processing of shrimp
- Contamination in seafood and its processing technology

#### **Prevalence of Malacostraca**

#### **The simple taxonomy of Malacostraca is**

- KINGDOM-Animalia
- PHYLUM-Arthropoda
- CLASS-Malacostraca
- SUBCLASS-Eumalacostraca
- ORDER-Decapoda
- SUB ORDER-Dendrobranchiata
- SUPER FAMILY-Penacoidea
- FAMILY-Penacidea
- GENUS-Penacus
- SPECIES-Penacus semisulcatus

**Common features of Malacostraca:** The shrimps have overlapping segments, however, in a different pattern, only the first two leg pairs are chelate, and they have a more complex larval form (Liston, 1992). That beside the eyes, Malacostraca have photosensitive vesicles associated with the central nervous system. Several types of shrimp are kept in home aquaria, some are purely ornamental, while others are useful in controlling algae and removing debris. According to Gilbert (Bremer, 1998; Doyle, 1997). Malacostraca are carnivores and there is ample reason to suspect that they are adaptive opportunists at all life stages

#### **Nutritional importance of seafood and shrimp:**

##### **Protein – Predominant free amino acids**

1.100mg/ 100g in tissues – octopine, praline, arginine.  
2.1g/100g in tissues – aspartate, leucine, alanine, lysine.

##### **Ballantyne and team members researched the nutritive composition of shrimp as follows**

Protein-17.7%  
Lipid-1.45% - Cholesterol  
Steroid hormones - 0.34 – 3.4%  
Carbohydrate-0.18%  
Ash-1.56%  
Moisture-79%

Nettleton (8) stated that seafood has captured headlines because of its unique health merits. The consumption of as little as one or two fish dishes per week may be of preventive value in relation to coronary heart disease.

##### **The lipid profile of shrimp is as follows,**

Phospholipid-49%  
Triglycerides -14.6%  
Free fatty acids-10%  
Esterified lipids-9.5%  
Glycolipids-27%  
Unknown-22%

##### **The vitamin content of shrimp is as follows, (Gilbert, 1976)**

Vit-5-30 IU/100g

Vit B12 -1.5 - 15  
Vit C-5 mg / 100g  
Thiamine-10 – 150  
Riboflavin -50 – 350  
Folic acid -10 – 40  
Niacin -1.5 – 4 mg/ 100g

##### **The average nutritional composition of shrimp is, (Nettleton, 1987)**

Moisture -81%  
Protein-13%  
Fat-1.5%  
Ash-1.6%

**Processing of shrimp:** For many applications in seafood processing plant, flake ice is preferred; it has the highest surface area volume ratio and thus melts and cools rapidly (Leo, 2007). That to prolong storage life, raw seafood must be processed in such a way as to preserve its natural freshness for as long as possible (Murray, 1982). With the changing socio economic trend there had been an apparent shift in the food habits, which resulted in the demand for highly processed seafoods (Olsen, 2000). That in Europe and Australia, it was common to boil small shrimps before marketing. They then might be retiled whole or peeled for canning or for freezing (Ranken, 1993). That preservation of seafood by chilling may only be suitable for a number of days or a week or two at the most, where as proper freezing and cold storage will enable the fish to be kept for 6 month or even upto a year or more. Freezing process as a process, which is carried out in an appropriate equipment in such a way that the range of temperature of maximum crystallization is passed quickly. That fish destined for the freezer may be dipped in a solution usually containing polyphosphate and sometimes other salts, these solutions help to retain moisture in the fish and reduce the amount of water lost when the fish is the wed. Both shrimp and prawns are versatile ingredients, and often used as an accompaniment to fried rice. Common method at preparation include baking, boiling and frying (Biswas, 1996).

**Contamination in sea foods:** That although the gram positive *Vibrio parahaemolyticus* is quite sensitive to freezing and thawing, it can survive in small numbers. The influence of ice or the bacteriological quality of the processed fishery products. In almost all the cases ice was traced to be a major source of contamination (16). The population of obligate anaerobes on external surfaces of marine species is usually negligibly small but in the intestine, where anaerobic conditions are normal, Clostridia may be found in significant numbers. Found that in addition to bacteria, yeasts and occasionally fungi are reported to occur on fish and shellfish however there is less information available on these micro organisms (Mopper, 1994). Marine mollusks, Bacillus, Micrococcus *Enterobacteriaceae* and *Vibrios* constitute a significant proportion of the, bacterial population.

Faecal Streptococci determined on the frozen seafood might give a more useful measure of sanitation of processing than *E.coli*, in view of their greater ability to survive freezing. Contamination by sewage or by human excreta is the greatest danger associated with drinking water. This water cause typhoid fever and dysentery. Slime forming bacteria in cooling water will decrease the efficiency of cooling (Clifford, 1991). According to Williams (Bremer, 1998) prevalent skin infections were often heavily laden with *Staphylococci* or *Streptococci*. Pandurango Rao and Gupta examined the presence of enteropathogenic *E.coli* and other coliforms in seafoods. Frazier (Doyle, 1997) reported that in general, freezing prevents the growth of most food-borne micro-organisms and refrigeration temperatures slow growth rates.

## **CONCLUSION**

Biogenic amines are used as a quality criterion in the selection of fish medals, used for commercial feeds, as their concentration in fish is an

indicator of spoilage. Fish meals from warm water species such as sanchovy and sardines generally have a higher concentration of histamine, while fish meals from cold water species like herring tend to display higher cadaverine concentrations. A linear negative correlation between cadaverine content in herring meals and the growth rate, feed efficiency ratio and final body weight of Atlantic halibut. Although they found no depressing effect on the feed intake, growth or feed conversion and no signs of acute toxicity or mortality occurred in 16 weeks of study, they observed stomach distension syndrome. Fish meal is not only used in animal diet but is also used in human foods known as fish protein concentrate. Although in humans if high quality raw reported, this type of meal can be a source of histamine poisoning in humans if high quality raw material and hygienic conditions are not applied during processing. Histamine poisoning with people handling fish meal containing high histamine. They suggested that the lowest permissible levels of histamine in fish meal and similar products should be set and legally adopted. It was reported that histamine is used as a quality criterion for fish meals manufactured principally from warm water species such as anchovy, mackerel and sardine. Therefore, the presence of histamine in fish meal is still a common problem.

## REFERENCES

- Bateman, Jr and DE.Mowdy, 1994. *Copper chelation assay for histamine in tuna. J Food Sci*, 3:517-518.
- Gilbert, R.J., G. Hobbs, CK. Murray, JG. Cruickshank and SEJ Young, 1980. Scombrototoxic fish poisoning: features of the first 50 incidents to be reported in Britain (1976-9). *Br. Med J*, 281:71-72.
- Nettleton and Joyce, 1987. *Seafood and health*, Van Nostrand Reinhold, New York, pp. 198-201.
- Leo,M.L. and Nolet, 2007. *Handbook of Meat, Poultry and Seafood quality*, pp. 103-110.
- Murray, CK,and G. Hobbs, 1982. Scombrototoxin and scombrototoxin-like poisoning from canned fish. *J Hyg*, 88:215-220.
- Olsen, S.J., L.C. MacKinon, JS. Goulding, NFL. Bean and L. Slutsker, 2000. Surveillance for foodborne disease outbreaks:United States, 1993-1997. *Center of Disease Control Morbidity and Mortality Weekly Report*. 49:1-51.
- Ranken, M.D and R.C. Kill, 1993. *Food Industries Manual - 23<sup>rd</sup> edition*, Micron laboratories, Luton, pp.537-539
- Biswas, K.P,1996. *A text book of Fish, Fisheries and Technology-2<sup>nd</sup> edition*, pp.85-100.
- William. C., Frazier, C . Dennis and Westhof, 2002. *Food microbiology-4<sup>th</sup> edition*, pp. 120-125
- Mopper, B and CJ Sciacchitano, 1994. Capillary zone electrophoretic determination of histamine in fish. *JAOAC Int*, 77:881-884.
- Clifford, MN., R. Walker, P. Ijomah, J. Wright, CK. Murray and R Hardy, 1991. Is there a role for amines other than histamines in the aetiology of scombrototoxicosis. *Food Addit Contam*, 8:641-651.
- Bremer, PJ., CM.Osborne, RA. Kemp, P. Van Vefhel and GC. Fletcher, 1998. Thermal death times of *Hafnia alvei* cells in a model suspension and in artificially contaminated hot-smoked kahawai (*Arripis trutta*). *J Food Prot*, 61:1047-1051.
- Doyle, MP., LR.Beuchat and TJ Montville, 1997. *Food Microbiology: Fundamentals and Frontiers*. ASM Press, Washington, DC. 872 p.
- Liston., 1992. *Institute of Food science and Technology. School of fisheries, University of Washington, USA*, pp. 93-95.
- Bremer, PJ., CM. Osborne, RA. Kemp, P. Van Vefhel and GC. Fletcher, 1998. Thermal death times of *Hafnia alvei* cells in a model suspension and in artificially contaminated hot-smoked kahawai (*Arripis trutta*). *J Food Prot*, 61:1047-1051.
- Doyle, MP., LR.Beuchat and TJ Montville, 1997. *Food Microbiology: Fundamentals and Frontiers*. ASM Press, Washington, DC. 872 p.

\*\*\*\*\*