

# Agricultural Application of Fish Amino Acids

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Organic inputs are much sought for sustainable agriculture due to reasons like protective effect on the soil fertility, promotion of plant health,

simply be used as a source of nitrogen. In addition, the peptides and amino acids may exert specific biofunctional role.



**Fish waste kept for fermentation**



**Terrace garden**

cost-effective crop management and enhanced productivity. Among the organic inputs, foliar inputs play a significant role in productivity. There is a growing interest in use of fish processing waste in the form of amino acids alone or in combination with other natural sources with specific functions. An attempt has been made in this article to briefly describe the research outputs recorded from various sources on variety of crops on the agricultural applications of fish amino acids.

## **Fish amino acid**

Fish amino acid is a product often prepared from fish discards or trash fishes through fermentation assisted by the addition of carbon sources like molasses, sugar, fruit waste etc. The product is light to dark brown in colour with typical sweetish smell devoid of fishy smell. The process takes 15-21 days for breaking the proteins better in to the simple components like smaller amino acids and very low molecular weight peptides. Fish amino acid can

## **Studies on Agricultural crops**

Though the production and application of fish amino acid for agricultural crops are practiced in various parts of the country, the scientific studies are limited. There is lot of scope to conduct the study on various crops in different agro climatic zones in India. Such studies are required in order to explore the benefits of using fish amino acids. Some of the studies related to fish amino acids and the outputs are listed in Table 1. A study on use of fish based fertilizer in comparison with commercial organic fertilizer on chilli has concluded that the fish fertilizer has the potential but did not perform better than the commercial one. Thus the study recommended enriching the fish amino acid with the high nutrients (Khir, 2019). The watermelon crop was applied with fish amino acid and herbal nutrients increased the plant growth, productivity, lycopene content etc. The high dose of fish amino acid

**Table 1: Effect of fish amino acid on agricultural crops** | general, the growth and yield is enhanced by the

S. No	Input	Fermentation period	Plant studied	Result	References
1	Fish waste, egg shell, molded white bread and molasses (4:1:1:4)	43 days	Chilli Plant (Capsicum annum)	Organic fish fertilizer has a good potential for plant growth.	Khair, 2019
2	Fish amino acid and Oriental Herbal Nutrients	30 days	Water melon (Citrullus lanatus)	Plant growth, production, lycopene content and soluble solids increased.	Gasana and Kim, 2020
3	Fish amino acid	-	Chinese Broccoli (Brassica oleracea var. alboglabra L.).	Enhanced the plant height, leaves number, branches, total leaf area and plant biomass	Amin (2021)
4	Amino fish AMI-16 with mycorrhizae and vermicompost	-	Sun flower (Oil seed crop)	Increased yield and its components.	Sarabi et al., 2022
5	Panchgavya @ 3%, and fish amino acid @ 0.5%, soil application of Farm Yard Manure @25 t/ha, Groundnut cake @ 100 kg/ha and Neem cake @ 200kg/ha recorded (25.55 t/ha)	-	Ash gourd	Higher fruit yield	Dhanushkodi and Nageswari; 2022.
6	Fish amino acid with FYM, Vermicompost and oil cake	-	African marigold (Tagetes erecta L.)	Yield and quality	Sivasankar et al., 2021
7	Fish amino acid fermented with bananas	-	GREEN CHILL	Yield increased (7.18 ton/ha)	Arani et al., 2023
8	Fish amino acid (1%)	10 days	Amaranthus	Enhanced the plant height, number of leaves per plant, fresh weight and dry weight of whole plant	Ramesh et al., 2020

found to negatively influence the soluble solid content but the lycopene content increased (Gasana and Kim 2020). Hence, in the application of fish amino acid one should be careful in the selection of application dose. The study on fish amino acid studied at different doses on the chinese broccoli concluded that 300 ml in 1 litre water and spraying resulted in enhanced the plant height, leaves number, branches, total leaf area and plant biomass (Amin 2021). In

application of fish amino acids. Research should focus on application of fish amino acid in combination with other nutrients and bioactive ingredients. As such as fish amino acid is abundant in nitrogen and phosphorous and also various types of amino acids. It is easily absorbable and stimulates the metabolic activity of microorganisms associated with the soil. Process modifications need to be explored.

In conventional practice, production of fish amino acid involves fermentation using molasses and jiggery. The process is time consuming and achieving the consistency in the end product quality is very difficult. Hence, the options like proteases assisted enzymatic hydrolysis, fermentation using specifically formulated microbial consortium, alternative carbon sources and their effect need to be explored.

### Fish amino acid – Market status

Due to growth witnessed in on line selling platforms, products like fish amino acid has a huge commercial and industrial potential in India. In general, the fish amino acid cost around Rupees 90 to 120/100 ml. The actual production cost is cheaper and the major cost incurred is towards the packaging material and carbon source used. Some of the popular brands which are selling fish amino acid are Abtec, Cleanom, My own garden, C-garden, Probio, Seed2plant, Keralagro, Amino Pearl, Sivalakshmi Organic farms, SAS enterprises, Aadaval, Bucket garden, Seamag etc. The competition in the market is growing day by day due to process simplicity, ease of manufacturing at any quantity.

### Conclusion

Fish and shellfish processing waste are rich in nutrients like proteins, lipids, and minerals. These valuable nutrients converted into their simpler molecules through fermentation. Particularly as fish based raw materials are rich in proteins, their conversion leads to the formation of amino acids. It serve as the source of nitrogen, in addition certain biological functions are also modulated in a beneficial way when it is up taken by the plants through various route including foliar applications. As an organic input in agricultural practices, fish amino acid can play a major role towards developing sustainable inputs and improved resource utilization.

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