Title A simple and rapid method for colorimetric determination of histamine in fish flesh

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**Abstract**

Histamine is a significant chemical hazard in fish. It is derived from the bacterial decarboxylation of amino acid histidine, that is present in large amounts in fish of *Scombridae* family and its presence is considered as a good indicator of temperature abuse and the state of good manufacturing practices adopted in the handling of such fish. A simple and rapid chemical method for determination of histamine in fish flesh is reported for use in seafood quality inspection laboratories. Good recoveries (>91%) were obtained for histamine at spiking levels ranging 1–60 mg/100 g. The overall precision (relative standard deviation, %) in the new assay ranged from 2.61 to 9.63. The interaction between the imidazole ring and *p*-phenyldiazonium sulfonate was made the basis of a quantitative colorimetric method for estimation of histamine. The results of the new assay showed a high correlation ($R^2$=0.999) with the assay of Hardy and Smith [J. Sci. Food Agric. 27 (1976) 595] in the recovery of histamine. The limit of detection was 1 mg/100 g for the new assay and was comparable with the existing methods. A concentration-based reference color scale is provided for the determination of defect and hazard action levels set by the regulatory agencies. Visual comparison of color intensity of test samples with standard concentrations in reference color scale for determining these levels without the aid of a spectrophotometer was an important practical application for rapidly estimating histamine in fresh fish fulfilling one of the HACCP requirements. The assay was simple requiring no laborious treatments, and may be suitable for routine analysis in monitoring of histamine in fish.