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Short communication

Histamine accumulation and histamine-forming bacteria in Indian anchovy (*Stolephorus indicus*)

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Abstract

Accumulation of histamine, trimethylamine (TMA), and total volatile base nitrogen (TVB-N), as well as microbial population incidence in Indian anchovy (*Stolephorus indicus*) during storage in ice and at 15 and 35 °C were investigated. Histamine was as low as 1.9 mg/100 g in 15 days at ice storage, but it increased to 19.0 mg/100 g after 32 h at 15 °C. Histamine rapidly increased to 25.4 mg/100 g when stored at 35 °C for 8 h. TVB-N and TMA began to sharply increase after 11 days in ice storage, but abruptly increased after 16 and 8 h of storage at 15 and 35 °C, respectively. A high number of *Enterobacteriaceae* (10^{10}–10^{11} cfu/g) was detected and shown to be the dominant group of microbial flora during spoilage of Indian anchovy at both 15 and 35 °C. A total of 153 bacterial strains were selected from the prescreening step using various selective media. Only 75.8% of these selected isolates showed a positive reaction in Niven's differential medium, and 27.6% of the positive isolates were true histamine formers when confirmed by the enzymatic method. Prolific histamine formers were identified as *Morganella morganii*, *Proteus vulgaris*, and *Enterobacter aerogenes*, and produced high histamine content of 104.1–203.0 mg/100 ml. Optimum growth and histamine production of selected strains of these three species was at 35 °C in histamine evaluation broth (HEB) containing 0.5% NaCl, pH 5. *E. aerogenes* produced the highest histamine of 500 mg/100 ml at the optimum condition. All studied strains did not produce histamine at ⩾10% NaCl.

Keywords: Histamine-forming bacteria; Anchovy; Histamine; *Stolephorus indicus*