

## **Determination of trans- and cis-urocanic acid in relation to histamine, putrescine, and cadaverine contents in tuna (*Auxis thazard*) at different storage temperatures**

### **Abstract**

Scombroid fish poisoning is usually associated with consumption of fish containing high levels of histamine. However, reports indicate that some cases have responded to antihistamine therapy while ingested histamine levels in these cases were low. Potentiation of histamine toxicity by some biogenic amines, and release of endogenous histamine by other compounds such as cis-urocanic acid (UCA) are some hypotheses that have been put forth to explain this anomaly. Very little is known about the effects of storage conditions on the production of both UCA isomers and biogenic amines in tuna. Thus, the production of trans- and cis-UCA, histamine, putrescine, and cadaverine in tuna during 15 d of storage at 0, 3, and 10 °C and 2 d storage at ambient temperature were monitored. The initial trans- and cis-UCA contents in fresh tuna were 2.90 and 1.47 mg/kg, respectively, whereas the levels of putrescine and cadaverine were less than 2 mg/kg, and histamine was not detected. The highest levels of trans- and cis-UCA were obtained during 15 d storage at 3 °C (23.74 and 21.79 mg/kg, respectively) while the highest concentrations of histamine (2796 mg/kg), putrescine (220.32 mg/kg) and cadaverine (1045.20 mg/kg) were obtained during storage at room temperature, 10 and 10 °C, respectively. Histamine content increased considerably during storage at 10 °C whereas trans- and cis-UCA contents changed slightly. The initial trans-UCA content decreased during storage at ambient temperature. Thus, unlike histamine, concentrations of trans- and cis-UCA did not result in elevated levels during storage of tuna.

**Keyword:** Cadaverine; Histamine; Putrescine; Scombroid fish poisoning; Tuna; Controlled-temperature storage; Urocanic acid