Abstract

Shrimps (Penaeid spp.) are economically important resources in the world with observed increasing demand in both domestic and export markets. However, shrimps are perishable products and their shelf life and wholesomeness during handling and storage are greatly influenced by both enzymatic and microbiological changes. Initial handling activities such as delayed icing, temperature variation during handling, mode of packaging and rough handling have been reported to be the major contributing factors to quality loss of the shrimps. In Kenya, shrimp fishing takes place in Malindi- Ungwana bay where both commercial and artisanal fishing actively takes place. However, artisanal fishing is mainly practiced in the nearshore and in salt ponds along the Bay. So far there is inadequate handling and storage equipment at disposal for use by artisanal shrimp fishers in this area. Shrimps are ferried with little or no icing to nearby centres for storage in iced insulated containers with no consideration of its effect on quality of the product. This potentially compromises the quality of shrimp both at catch and during storage. This study was therefore conducted to determine the effect of delayed icing on quality of Panaeid shrimps both at catch and during storage using ambient and vacuum packaging in Kurawa North coast Kenya. Sample collection involved six artisanal fishers using seine fishing nets. Samples collected were partly subjected to immediate icing after catch (control), others were iced at landing time (0-hr) while the rest were sub-sampled and iced at an interval of 2 hours (2-hr), 4 hours (4-hr) and 6
hours (6-hr) delayed icing after landing. Sub samples were stored in ice in laboratory for a period of 12 days under ambient (atmosphere) air and vacuum packaging conditions. Biochemical quality parameters (TVB-N, TMA-N, PV, p-AV) were used to monitor quality changes during storage period. TVB-N, TMA-N, PV and p-AV quality parameters for both samples stored under ambient air and vacuum packaging conditions increased significantly (p < 0.05) throughout the storage period. Within 12 days of storage under ambient air packaging TVB-N values for samples iced at point of catch (control) rose from 1.84 mg N/100g to 4.66 mg N/100g for day 0 and 12 respectively. The highest TVB-N values observed were from samples iced 6 hours (6-hr) after landing being 16.04 mg N/100g and 24.41mg N/100g for Day 0 and day 12 respectively. On the other hand, samples iced at catch and stored under vacuum packaging gave TVB-N values of between 1.84 mg N/100g and 3.46 mg N/100g for control and 6-hr delayed icing respectively. For TMA-N, 12 days storage period under ambient air packaging gave values of 2.30 mg N/100g and 4.66 mg N/100g being control and day 12 respectively. The highest values for TMA-N of 10.11 mg N/100g were observed on samples with the highest delayed icing period (6-hr) stored under ambient air packaging condition. PV control day 0 was lowest in value and the highest PV was the 6-hr day 12 with values being 4.02 meqO₂/kg and 30.26 meqO₂/kg respectively. Similar observation was seen on p-AV where the lowest values were 4.32 meqO₂/kg for control day 0 and 134.25 meqO₂/kg for 6-hr day 12 samples. Generally, control samples exhibited better shelf life than 0-hr samples, followed by 2, 4 and 6-hr samples. Lower values of TVB-N, TMA-N, PV and p-AV were observed in vacuum packaged samples compared to ambient (atmosphere) air packaged ones. Better performance was observed with vacuum packaging compared to ambient air packaging. Samples iced immediately after catch (control), followed by 0 and 2 hours had better shelf life than those iced at 4 and 6 hours after landing. It was concluded that delayed icing of shrimp during the initial handling compromises the quality and limits the shelf life period of shrimps significantly during storage.

Keywords: Shrimps, artisanal, packaging, quality, storage, Kurawa