Abstract
VIII. ABSTRACT

In the present study, our aim was to extract and evaluate phenolic compounds with antioxidant and antimicrobial activities from grape (GSE) and papaya seeds (PSE) using \textit{in-vitro} models \textit{viz.}, total phenolic (TPC) and flavonoid content (TFC), DPPH and ABTS scavenging activity, metal chelation, ferric reducing power, linoleic acid model and antimicrobial activity by disc diffusion method. The linoleic acid model showed that the addition of GSE and PSE to the reaction mixture inhibited peroxidation by 81.2 and 65.04 \% at 500 mg/L and 1000 mg/L respectively. The GSE contained 4 times higher phenolic and 6 times higher flavonoid content compared to PSE. GSE showed higher antimicrobial activity on gram+ve strains compared to PSE. A batch of whole mackerel and steaks were dip treated with GSE, PSE and butylated hydroxytoluene (BHT as reference) at 500, 1000 and 200 mg/L respectively with a control and stored separately in iced and frozen conditions to study the shelf life characteristics periodically. The treatment with GSE and PSE during ice storage was found to be more effective in steaks compared to whole mackerel and shelf life of control, PSE, GSE and BHT were found to be 9, 12, 15 and 15 d respectively for whole mackerel. All the treatment groups of steaks were in acceptable condition even after 15 d of ice storage. The combination of GSE and PSE with frozen storage of whole mackerel and steaks were found to extend the shelf life when compared to control. The shelf life of control groups were observed to be 120 d, whereas GSE, PSE treated whole mackerel and steaks were found to be in acceptable condition even after 180 d of frozen storage. In the present investigation, it is evident that, the effect of GSE at 500 mg/L can be compared with the legal limits of BHT and found to have very good antioxidant and antimicrobial properties than PSE. Therefore GSE can be suggested as the most promising natural preservative in fish processing industry.