Healthy food being the essence of maintaining good health of human being, tendencies and practices of food contamination or adulteration are noticed to persist in the society in spite of control measures being taken to restrict them. Toddy is one among the established natural alcoholic drinks produced and consumed throughout Asia particularly in India, Sri Lanka and Bangladesh. It is the fermented sap obtained from various palm trees and is considered as one of the safest nutritious drinks available. Kerala is known for its highest liquor consumption in India, where working class resort to toddy as their regular drink.

Due to increase in consumer demand, the shortage of coconut or palm tree, shortage of tappers since the new generation is unwilling to accept this as a job, it has often been diluted and adulterated with intoxicating drugs to get the same degree of intoxication. The adulteration of toddy primarily involves mixing cheap country arrack primarily meant for industrial purpose and chemicals like diazepam, phenobarbitone, and chloral hydrate to give high intoxication, sedation and muscle relaxing effects to the consumers. These drugs are generally considered to be dangerous when consumed along with alcohol.

Considering all these facts, a time dependent study was conducted as the first part, by analyzing the changes in physical and chemical parameters of natural toddy collected from different districts in the state of Kerala, from the time of collection up to 48 hrs and also analyzed the major constituents of adulterated toddy. The alcohol percentage was analyzed from the time of collection at an interval of 6 hrs. Odour was noted at various dilutions at the same intervals. Samples of shop toddy were collected from licensed shops in various districts of the state of Kerala from where adulterations were reported frequently. The adulterated toddy samples were further analyzed for various physical and chemical parameters. The physical and chemical properties of natural toddy and adulterated toddy viz, turbidity, odour, percentage transmission of supernatant, pH, alcohol content, ascorbic acid, phosphorous, potassium, sodium, total acidity, ash content and alkalinity of water
soluble ash were studied. The study revealed that in natural toddy samples turbidity, ascorbic acid, phosphorous, potassium, sodium and ash content were higher than adulterated samples and percentage transmission of supernatant and alcohol contents were lower than adulterated samples. As second part, the toxicological effects of common adulterants of toddy such as diazepam, phenobarbitone and chloral hydrate were ascertained in experimental animals by administering the above adulterants alone and co-administered with toddy by following the parameters such as liver marker enzymes, lipid peroxidation products and also the enzymic and nonenzymic antioxidant status. The levels of AST, ALT, ALP, GGT, ADH, ALDH, LDH were increased and cholinesterase activity, total protein and albumin levels were decreased in co-administered groups. TBARS and CD contents showed significantly increased concentration and GSH and Catalase showed a decline and GST showed an increase in co-administered groups. Finally the study pertaining to the damaging effects of these adulterants on cultured hepatoma cell lines were also conducted.

**Key words**

Toddy, Diazepam, Phenobarbitone, Chloral hydrate