

## A B S T R A C T

A comparative study of different methods of amperometric titration of the sulphhydryl group is described. The factors varied included: (1) the microelectrode, (2) the titrant, (3) pH and (4) voltage. A new rotating hanging mercury drop electrode was developed, and a method employing it was successfully applied to coconut toddy to determine both RSH and RSSR content. RSH content in fresh toddy lay between 1.4 and 1.9mM, while RSSR content was negligible. On autoclaving and aging RSH content declines and RSSR content increases. Fermentation frequently results in the conversion of RSH to RSSR and  $H_2S$ .

Studies show that the mechanism of  $H_2S$  formation involves two steps. (1) hydrolysis of protein to release RSH and (2) conversion of RSH to  $H_2S$  (and RSSR); the former probably accomplished by the enzyme cysteine desulphhydrase. This theory is supported by evidence from (1) RSH and RSSR content, (2) fermentation with cysteine in a synthetic medium, (3) studies with different strains of yeasts and (4) studies with cell-free extracts. On the basis of this theory the inability of some yeast strains to produce  $H_2S$  may be due to one or both of the following: (1) inability to hydrolyse the proteins of toddy and (2) deficiency of the enzyme cysteine desulphhydrase.

Sweet toddy was found to contain small amounts of sulphide; sulphide content being determined by an electrochemical micro-method of assay.

The  $H_2S$  problem in toddy was solved in the laboratory in two ways (1) by use of a non- $H_2S$  producing strain of yeast, (2) by addition of small amounts of  $NH_4^+$  into toddy. On a commercial scale these solutions could theoretically be applied in bulk formation as well as in the pot during collection. These studies showed that the best solution would be to add the  $NH_4^+$  into the pot; here a 25% increase in yield of alcohol could be obtained, in addition to suppressing  $H_2S$  formation. Application of this method could result in a net gain of Rs. 4.5 million per annum to the industry.