ABSTRACT

The present investigation was designed to explore the possibility of using Mahuda flowers as an energy yielding dietary component. The safety and feasibility of Mahuda flowers as a dietary component, was investigated in an animal model, using vulnerable groups of rats.

The Mahuda flowers obtained from Chhotaudepur District, Gujarat, were analysed for their nutritive composition. The chemical analysis of Mahuda flowers revealed that they contain 72% of sugar and therefore could be utilized as a major food energy source in the supplementary feeding programmes, if found suitable for human consumption.

The flowers were pressure cooked for 10 or 20 minutes and were airdried to make them safe for consumption. They were fed at 25% or 50% level as a food energy source to replace either half or full amount of dietary sago carbohydrate. The effects of feeding Mahuda flowers were explored on growth and bio-chemical status of weanling rats. It was observed that the diet containing 25% or 50% Mahuda flowers was nutritionally inferior to the sago-bengalgram diet. Regardless of cooking time and at both levels, feeding of Mahuda flowers adversely affected food intake, growth rate, organ weights and biochemical status of the weanling rats. However, the degree of adverse effects was related to the levels of the Mahuda flowers in the diet. The growthrate of rats fed diet containing 25% of Mahuda flower was higher than those fed 50% of Mahuda flower diet. Also, the effects on growth and biochemical status were less deleterious when the cooking time was increased from 10 to 20 minutes. The

values for food intake, body weight and organ weight of rats fed diet containing 30 minutes cooked Mahuda flower at 25% level, were more close to the control values. It appeared from these data that it would not be unsafe to consume if necessary 25g of Mahuda flower cooked for 30 minutes per 100g diet during the growth period.

The impact of feeding 25g of pressure cooked Mahuda flowers as the source of energy was explored, on the nutritional status of pregnant rats, lactating dams and their offsprings. During the period of pregnancy, the rats fed Mahuda flowers diet either throughout the gestation or during the first half of the gestation period, gained 19 to 21% less weight than those fed sago-bengalgram diet. Also, litter size was decreased by 11 to 18% in the former groups as compared to that of the latter group. Histopathologically, abnormal changes in placenta of the rats fed Mahuda flower diet were noted. During the period of lactation, the dams fed Mahuda diet for entire gestation and lactation periods or only during the period of gestation, gained less weight than those fed Mahuda diet only during the lactation period or fed sago-bengalgram diet in the periods of gestation and lactation. However, the birth weight of pups was not affected by feeding of Mahuda diet to pregnant rats. But, the pups weaned at 21 days of age, nursed by the dams fed on Mahuda diet at an, stage, during the pregnancy or lactation periods, exhibited growth arrest. Also, enlargement of kidneys, heart and intestines was observed. These results suggest that during the period of pregnancy and lactation, it would not be safe to consume Mahuda flowers to contribute about 10% (25g Mahuda flowers/100g diet) of the total carbohydrate in the diet. But if the flowers are to be consumed because of food scarcity, their consumption should be avoided during first half of the gestation period.

Based on thin layer chromatography technique, it was observed that Mahuda flowers used in the study, contained 2.56% crude isolate saponin which had acrid smell and foam forming activity. The Rf value of Mahuda flower saponin ranged between 0.56% to 0.65%. The alcoholic and water extracts of Mahuda flowers containing varied concentration of crude saponin, generated irritation on the smooth muscles of the gastro-intestinal tract. The process of steaming did not detoxify the saponin content or any other anti-nutritional factors present in the flowers. It is essential that the processes is/are devised which would remove the Mahuda flower saponin or any other toxicant present therein, selectively or modify it to make the flowers harmless so that the flowers can be utilised as food energy source.