

ABSTRACT

The use of herbal medicines in diabetes treatment is still a reality in Third World Countries. The annatto is one of the plants widely used as an oral hypoglycaemic. Preliminary findings on the annatto, by a study group at the University of the West Indies showed, however, that anaesthetized dogs fed the crude extract of this annatto exhibited signs of hyperglycaemia. This unexpected result prompted further investigation.

Studies commenced in 1985 to determine which component(s) from the crude extract was responsible for the observed hyperglycaemia. The chloroform eluent of the annatto seeds was separated by a chromatography sequence and recrystallizations, yielding a single bioactive component.

Analysis by GC-mass spectrophotometry showed this component to be 99.4% pure, having a molecular weight of 394.2 and fitting the molecular formula $C_{25}H_{30}O_4$. Further analysis by infrared (IR) spectrophotometry and proton nuclear magnetic resonance (NMR) supported the suggested molecular formula. Corroborative evidence was provided by ^{13}C -NMR, confirming the structure of the hyperglycaemic agent as being that of transbixin.

When this transbixin was fed to anaesthetized dogs in the amount of 0.6 g/Kg body weight, the dogs exhibited

persistent hyperglycaemia. Additionally, electron microscopy revealed that they suffered severe damage to liver, kidney and pancreatic tissues to an extent that suggested that transbixin was not just hyperglycaemic, but also diabetogenic and toxic.

Annatto pigments have, however, been listed by the FAO/WHO as being safe for human consumption and is widely used as colouring for butter, cheese, soups and other foods. The findings of this study indicate that another look will have to be taken at the annatto extracts as food additives, since transbixin is a major constituent. Further, the millions of poor in developing countries who continue to use annatto as a treatment for diabetes and other systemic ailments will need to be re-educated as to the possible implications of its continued use.