

Effect of dietary baobab oil on the hepatic Δ -9 desaturase in the rat.

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Refined baobab seed oil is consumed by the Malagasy population (inhabitants of Madagascar and the adjacent islands). The oil contains cyclopropenoic acids (sterculic and malvalic acids) assumed to have a deleterious effect on health.

The purpose of this work was to study the influence of diet containing fresh baobab seed oil on the *in vitro* conversion of stearic acid (18:0) into oleic acid (18:1 n-9) by Δ 9 desaturation in rat liver microsomes, in comparison with heated baobab oil- or control oil-containing diet or with a fat-free diet.

Weanling male rats were divided into 4 groups of $n = 4$ animals for 4 wk and fed a fat-free diet (FF) or a diet with 10% fat weight consisting of fresh baobab seed oil (BO) or heated baobab oil (HBO) or a mixture of palm and sunflower oils (MO). Heat treatment at 220 °C for 8 h (Grandgirard *et al*, 1984) induced high decomposition of cyclopropenoic acids.

At the end of the 4-wk diet period, the rats were killed and the liver microsomes isolated. Desaturate assay conditions were essentially as described previously (Blond *et al*, 1990), except

that 4 concentrations of ¹⁴C 18:0 levels were used for each assay. The fatty acid composition of liver microsome lipids was also studied.

Greater Δ 9 desaturase activity was found in the FF group. The HBO diet did not modify the activity of the enzyme when compared with the MO dietary group. However, an inhibition was observed for the BO diet with the higher concentrations of substrate. The changes in the relative mono-unsaturated content in liver microsome lipids was not parallel to the modification in desaturase activity. The 2 baobab groups showed a lower 20:4n-6/18:n-6 ratio (index of the conversion of 18:2n-6 to 20:4n-6), compared to the MO group. This did not seem to be related to the 18:2n-6 dietary content since MO, BO and HBO diets had similar levels of the essential fatty acid.

The effect of dietary cyclopropenoic acids on Δ 9 desaturation complete previous data on the inhibition of this reaction by dietary sterculate (Pande and Mead, 1970). Our results additionally suggest an inhibition of the Δ 6 and/or Δ 5 desaturases. The exact mechanism by which cyclopropenoic acids or other components of baobab seed oil can affect desaturase activity requires further investigation.

References

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