

Effect of feeding sandalwood seed oil on growth and SGOT activity in mice

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The edible seed kernel of West Australian sandalwood (*Santalum spicatum*) has been an important part of the traditional Aboriginal Australian diet and has been used crushed as a dermal application to treat skin lesions. The distinctive feature of the fixed oil, which accounts for about 50% seed content, is the presence of ximenynic acid (XMY, 30-35%, trans-11-octadecen-9-ynoic acid). Acetylenic fatty acids may act as enzyme inhibitors in fatty acid metabolism (1). This study was designed to assess the effects of the seed oil on growth rates of and serum glutamate oxaloacetate transaminase (SGOT) activity in mice.

Six week old ARC strain female mice were randomly divided into three groups each of 15 mice, fed semi-synthetic diets containing 5% fat standard lab chow (SLC), 15% canola oil (CO), and 15% sandalwood seed oil (SWO) for eight weeks. In each group, mice were ear marked, and individual body weights recorded weekly. Blood (max 0.3 mL) was collected using a Pasteur pipette from the retro orbital venous plexus in weeks 0, 4 and 8 SGOT testing used 20 μ L of diluted serum (1 to 10, in 0.9% NaCl).

Week	Body weight (g)			SGOT (IU/L)		
	SLC	CO	SWO	SLC	CO	SWO
0	25.67 \pm 1.74	27.32 \pm 2.06	26.46 \pm 2.79	33.94 \pm 5.45	31.85 \pm 6.86	39.58 \pm 8.07
2	26.42 \pm 2.02	28.90 \pm 2.90	27.11 \pm 2.20			
4	28.23 \pm 2.25	30.98 \pm 3.79	28.21 \pm 2.85	39.78 \pm 7.30	45.25 \pm 6.11	61.90 \pm 7.74
6	28.39 \pm 2.89	31.90 \pm 4.17	28.17 \pm 2.69			
8	29.72 \pm 2.60	32.68 \pm 4.89	29.49 \pm 3.11	38.31 \pm 5.88	62.70 \pm 10.33	54.46 \pm 13.55

Marked diet-related effects were noted ($P < 0.05$). While mice fed on the SLC diet displayed a 15.8% weight increase over the eight week period, those fed on the CO diet showed an increase of 19.6%, and those fed a SWO diet gained weight to the lesser extent of 11.5%. Examination of the SGOT levels, which are normally 23.2 - 48.4 IU/L, was used as an indicator of possible dietary liver damage. The SGOT levels of SLC diet-fed mice increased about 12.9% over the eight week test period, remaining within normal range (NR), whereas the CO diet caused a marked increase of 96.9%, and the SWO diet an increase of 37.6% over the same period, both being greater than the NR. Mice fed the SWO diet all showed loss of snout whiskers, but no fur, at the third week of feeding. Histological examination of snout and liver sections of mice from SWO, CO and SLC groups showed no pathological differences in these organs.

We conclude that while the ingestion of a diet rich in sandalwood seed oil (SWO) by mice has produced some change in SGOT levels, these are less than those found with a CO diet. The most significant effect of SWO ingestion was an apparent reduction in body weight gain, which may suggest an effect by XMY as a growth retardant. We have no explanation for whisker loss.

1. Downing DT, Barve JA, Gunstone FD, Jacobsberg FR, Jie MLK. Structural requirements of acetylenic fatty acids for inhibition of soybean lipoxigenase and prostaglandin synthetase. *Biochim Biophys Acta* 1972;280:343-7.