

## Anti-Obesity Activity of *Garcinia xanthochymus*: Biochemical Characterization and In vivo Studies in High Fat Diet-Rat Model

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**Abstract :** Overweight and obesity is a serious medical problem, increasing in prevalence, and affecting millions worldwide. Investigators have been trying from decades to articulate the burden of obesity and related risk factors. To answer this problem, we suggest a new therapeutic anti-obesity compounds from *Garcinia xanthochymus* fruit. However, there is little published scientific information on non-hydroxycitric acid *Garcinia* species. Our findings include biochemical characterization of the fruit; in vivo toxicity and bio-efficacy study of *G. xanthochymus* in high fat diet wistar rat model. We observed that *Garcinia* pericarp is a rich source of organic acids, polyphenols, mono- (40.63%) and poly-unsaturated fatty acids (16.45%; omega-3: 10.02%). Toxicological studies have showed that *Garcinia* is safe and had no observed adverse effect level up to 400 mg/kg/day. Body weight and food intake was significantly ( $P < 0.05$ ) reduced in oral gavage treated rats (sonicated *Garcinia* powder) in 13 weeks. Subcutaneous fat was significantly ( $P < 0.05$ ) reduced in *Garcinia* treated rats. Hepatocytes significantly ( $p < 0.05$ ) overexpressed sterol regulatory element binding protein 2, liver X receptor-  $\alpha$ , liver X receptor-  $\beta$ , lipoprotein lipase and monoacylglycerol lipase. Fatty acid binding protein 1 and peroxisome proliferator activated receptor-  $\alpha$  were down regulated as assessed by real time qPCR. Currently our research is focused on the adipocyte obesity related gene expressions, effect of *Garcinia* on 3T3-adipocyte cell lines and high fat diet induced mice model. This in vivo pre-clinical data suggests that *G. xanthochymus* may have clinical utility for the treatment of obesity. However, further studies are required to establish its potency.

**Keywords :** *Garcinia xanthochymus*, anti-obesity, high fat diet, real time qPCR

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