

**UNIVERSITI TEKNOLOGI MARA**

**THE EFFECTS OF *Zingiber zerumbet*  
RHIZOME ETHANOLIC EXTRACT  
ON SEXUAL BEHAVIOUR, SPERM  
PARAMETERS, TESTOSTERONE  
AND TESTES HISTOLOGY  
IN HFD-INDUCED OBESE RATS**

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## ABSTRACT

Obesity is a worldwide health problem that may impose infertility risk in males. This study was conducted to determine the effects of *Zingiber zerumbet* rhizome ethanolic extract (ZZREE) on sexual behaviour, sperm parameters, testosterone, and testes histology in high fat diet (HFD)-induced obese rats. Twenty male Sprague Dawley rats were fed with HFD containing 50% normal rat chow pellet, 20% pure ghee, 20% full cream milk powder, 6% corn starch and 4% corn oil for 6 weeks to induce obesity. In addition, a group of normal rats (n=5) was treated with 1% bwt saline and served as normal control. Obese rats were randomly divided into four groups of 5 rats each. Group 2 was treated with 1% bwt of saline and served as a negative control. Groups 3, 4, and 5 were orally treated with ZZREE (200, 300, 400 mg/kg respectively) once daily for six weeks. Body weight and the length of rats were taken on a weekly basis to monitor body weight changes and to measure the Lee's Index (index of obesity). Upon completion of the treatments, sexual behaviours of male rats were observed. Then, all males were sacrificed for sperm analysis, testosterone and testes histology analyses. Index of obesity was decreased in obese rats treated with ZZREE (200 and 300 mg/kg) but not statistically significant compared to the negative control group. ZZREE 200 and ZZREE 300 showed significant improvement ( $p<0.05$ ) in intromission latency (IL) compared to the negative control group. Sperm count, sperm motility and the percentage of sperm with normal morphology were increased significantly ( $p<0.05$ ) in obese rats treated with ZZREE, compared to obese rats treated with saline. ZZREE at all concentrations also significantly increased ( $p<0.05$ ) the testosterone levels of HFD-induced obese rats. In addition, the Johnsen's scores ZZREE at all concentrations were significantly higher ( $p<0.05$ ) compared to the negative control which indicate an improvement in spermatogenesis. Despite a significant decrement ( $p<0.05$ ) in the diameter of lumens, ZZREE-treated obese rats showed a significant increment ( $p<0.05$ ) in the width of spermatid-sperm layers compared to the negative control group. Therefore, it can be concluded that ZZREE is not effective in combating obesity. However, ZZREE showed positive effects in improving sexual behavior, sperm quality, testosterone and testis histological structures in HFD-induced obese rats. A further study is suggested to elucidate the mechanism involved.

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