

Obesity, a multifactorial disorder, has become a worldwide epidemic. The objective of this study was to evaluate the antihyperlipidemic effect of sericin and probiotics (*Lactobacillus Acidophilus*) on serum profile and histology of selected organs (liver and kidney) in high fat diet induced obese mice and characterization of sericin protein. This experiment was conducted of 9 groups; Negative control, Positive Control, Low Sericin (LSer), Medium Sericin (MSer), High Sericin (HSer), Low probiotic (LP), High Probiotic (HP), Combination of Sericin and Probiotic (Ser+P) and Preventive (Pre) group. The mice groups were administered orally with different doses of sericin and probiotic for consecutive 28 days. Weekly body weight was measured. Mice were dissected on day 30 to collect blood serum and selected organs for histology. Biochemical assay of Liver Function Test (LFT), Renal Function Test (RFT) and histological study of liver and kidney were performed for the determination of protective role of different treatments. The LFT showed the effective results of bilirubin, AST and ALT after treatment with sericin and probiotics when compared with PC. RFT also showed the controllable range of urea and creatinine after treatment. Hence, sericin has potential to recover elevated obesity, Hematological parameters and degenerative changes in liver and kidney. Probiotics also have beneficial results but sericin and probiotic combination showed highly effective results in obese mice. So, it can be used as a supporting option in the diseases treatment.