

# **Evaluation of the possible apitherapeutic value of bee venom and bee propolis on L-arginine-induced acute pancreatitis and lung injury in albino rats**

## **Abstract:**

**Introduction:** Acute pancreatitis (AP) is a disease that results in inflammation of the pancreatic tissue. The most characteristic features of this disease are activation of digestive enzymes such as amylase and lipase with subsequent release of pro-inflammatory cytokines. It may be complicated with multiorgan failure. Pulmonary complications are considered the most frequent and most serious complications. Apitherapy is a type of natural medicine that uses honey bee products like bee venom and bee propolis for treating various diseases.

The aim of the study: To elucidate the apitherapeutic value of bee venom and bee propolis on L-arginine-induced acute pancreatitis and its associated lung injury complication in adult male albino rats via biological study.

**Materials and methods:** This study was performed on 70 adult male albino rats. Rats were randomly divided into seven groups: Group I :Control group (CG), Group II :Acute pancreatitis group (AP) in which pancreatitis was induced by two intraperitoneal (i.p.) injections of 2g/kg L-arginine, 1 h apart, Group III :Bee venom (250µg/kg subcutaneous (s.c.) injection) + L-arginine treated group (BVL), Group IV: Bee propolis (300mg/kg intramuscular (i.m.) injection) + L-arginine treated group (BPL), Group V: Combined therapy group (CT), Group VI: Bee venom only treated group(BV) and Group VII: Bee propolis only treated group (BP). The diagnostic markers, including serum lipase and amylase, GGT, glucose, CRP, tissue total antioxidants and RT-PCR analysis of matrix metalloproteinase-9 (MMP-9), were measured. Histological (using hematoxylin & eosin stain) and immunohistochemical (using NF-κB immunostain) techniques were done. The morphometric study was performed for area % and optical density of

immunoexpression of NF- $\kappa$ B in pancreatic and lung tissues. All performed measurements were followed by statistical analysis.

**Results:** Acute pancreatitis group revealed a significant increase in amylase and lipase serum levels, increase in MMP-9 expression and a decrease in the total antioxidants tissue content. Histopathological results demonstrated widening of the connective tissue septa of the pancreas with degeneration of pancreatic acini in AP group while, the lungs showed thickened interalveolar septa with inflammatory cellular infiltration. A significant increase in immunoreactivity of NF- $\kappa$ B in pancreatic and lung tissues was also observed. The pretreated groups showed a significant improvement of these biochemical and histological changes.

**Conclusions:** There was a significant role of pretreatment with bee venom and bee propolis in ameliorating biochemical and histopathological changes in AP group