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# Evaluating the effect of *Zingiber officinale* in heart failure and investigating the bioactive compound responsible for protective effect through molecular modeling studies

**Neeraj Agrawal**
Kashi Institute of Pharmacy, India

Heart failure (HF) is a leading major health problem with increased morbidity and mortality worldwide. The present study evaluates the effect of *Zingiber officinale* root extract (ZORE) in isoproterenol (ISO) induced heart failure in rats. Our study indicated the significant increase in plasma nitric oxide (NO) levels, C-reactive protein (CRP), homocysteine, apolipoprotein B (apo-B) and cardiac tissue lipid peroxidation in ISO treated rats with a concomitant decrease in plasma apolipoprotein A1 (apo-A), lipase activity and cardiac tissue troponin levels when compared with controls. However, pretreatment of ISO administered rats with ZORE (150 mg/kg b.wt/day for 45 days) markedly brought the observed alterations toward near normal level indicating its protective role against heart failure. Further, the interaction of phytocompound, 6-Shogaol with peroxisome proliferated activated receptor (PPAR) was determined using docking analyses and molecular dynamics simulation studies. Molecular docking analysis indicated that PPAR receptor showed strong hydrogen bond interactions with 6-Shogaol. In conclusion, our results suggest that ZORE is a strong protective agent against ISO-induced heart failure and 6-Shogaol is responsible for this protective action which is confirmed by molecular docking and molecular dynamics studies.

## Biography

Neeraj Agrawal completed his masters at JSS College of Pharmacy. Currently he is working as faculty in the Department of Pharmaceutical Sciences, Kashi Institute of Pharmacy, India, and he is a Managing Director at SMS group of Institutions.

neeraj_pharm@rediffmail.com

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