

Antinociceptive Effect of *Terminalia bellirica* in Diabetic Peripheral Neuropathy: a Comparison with Fluoxetine, Imipramine and Quercetin

Ganji Srinivas RAO ^{1*}, Mahboubeh RAZAVI ², Hamed KARIMIAN ², Nanjundan Prem KUMAR ¹,
Deepak Kumar KHAJURIA ¹, Pradeep SRINIVAS ¹, & Devkar Satish SAHEBRAO ¹

¹ Department of Pharmacology, Krupanidhi College of Pharmacy, Bangalore, India

² Department of Pharmacy, Faculty of medicine, University of Malaya, Kuala Lumpur, Malaysia

SUMMARY. The present study was undertaken to evaluate the possible antinociceptive effect of *Terminalia bellirica* fruit aqueous extract in animal models of diabetic neuropathic pain. Diabetes was induced by streptozotocin (50 mg/kg i.p.). *T. bellirica* (70 mg/kg), fluoxetine (14.5 mg/kg), imipramine (10.5 mg/kg) and quercetin (10 mg/kg) were administered orally for 21 consecutive days, starting after 4th week in streptozotocin induced diabetic rats. Hot plate test, tail immersion test and formalin test were used to assess the antinociceptive activity. For assessment of the role of opioid receptors in antinociception of *T. bellirica*, naloxone (2 mg/kg, i.p.) as opioid receptor antagonist was injected prior to its administration. Thiobarbituric acid reactive species (TBARS), catalase and superoxide dismutase were also estimated to evaluate oxidative stress. Diabetes induced axonal degeneration was assessed histopathologically. *T. bellirica* attenuated hyperalgesia in streptozotocin induced diabetic rats. Furthermore, *T. bellirica* significantly decreased TBARS and restored the activity of SOD and catalase towards normal. Histopathological examination of sciatic nerve also confirms the protective nature of *T. bellirica*. Antinociceptive activity of *T. bellirica* was reversed by prior administration of naloxone, and, was comparable with standard treatments like fluoxetine, imipramine and quercetin. The antidepressant and anti-oxidant activity of *T. bellirica* may be responsible for its antinociceptive action in diabetic neuropathy.

KEY WORDS: Diabetic neuropathy, Fluoxetine, Imipramine, Naloxone, *Terminalia bellirica*.

* Author to whom correspondence should be addressed: E-mail: gsrao2014@gmail.com