BJP

Bangladesh Journal of Pharmacology

Research Article

A Journal of the Bangladesh Pharmacological Society (BDPS)
Journal homepage: www.banglajol.info
Abstracted/indexed in Academic Search Complete, Asia Journals Online, Bangladesh Journals Online, Biological Abstracts, BIOSIS Previews, CAB Abstracts, Current Abstracts, EMBASE/Excerpta Medica, Google Scholar, HINARI (WHO), International Pharmaceutical Abstracts, Open J-gate, Science Citation Index Expanded, SCOPUS and Social Sciences Citation Index;
Bangladesh J Pharmacol 2016; 11: 634-645
ISSN: 1991-0088

Anti-depressant activity of *Nyctanthes arbor-tristis* in mice

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Article Info

Received: 4 February 2016
Accepted: 28 April 2016
Available Online: 19 June 2016

DOI: 10.3329/bjp.v11i3.26682

Cite this article:
Gupta S, Kashyap P, Asad M, Chattopadhyaya I, Dahiya R. Anti-depressant activity of *Nyctanthes arbor-tristis* in mice. Bangladesh J Pharmacol. 2016; 11: 634-45.

Abstract

The present study assesses the protective effect of *Nyctanthes arbor-tristis* (*Nyctaginaceae*) extracts and in combination with fluoxetine on stress-induced depression in mice. Leaves were extracted using different solvents (petroleum ether, chloroform and hydroethanol) and administered orally for 14 days. These extracts showed significant improvement in the mobility percentage but among these, hydroethanol extract showed better protective effect from day 1 to 14 in both forced swimming and tail suspension test model. Hydroethanol (100 mg/kg) and chloroform (100 mg/kg) extracts with fluoxetine showed synergistic effect when compared with fluoxetine treated group (10 mg/kg) alone at day 7 and 14. Among monoamine levels only hydroethanol extract (400 mg/kg) restored the 5-HT level near to level of fluoxetine-treated group. Hydroethanol extracts with two higher doses showed significant decrease in glucose and triglycerides levels. Clinically, it may useful as anti-depressant drug.

Introduction

Depression is a common stress related mood disorders that can be precipitated at any time of life. However, it becomes a severe abnormal condition occur in behavior such as abnormalities in mood, development of neuro-vegetative functions, cognition and psychomotor activity (Moinuddin et al., 2012).

The exact pathomechanism behind this depression is still remains obscure, but the evidences suggest that a decline in the levels of neurotransmitter in the brain may leads to depression. Among the monoamines, decreased level of 5-hydroxytrptamine (5-HT) is report to play an important responsibility in the progress of depression (Gupta et al., 2011).

Traditional medicines as an extract form derived from plants have been widely used for the treatment of depression and other related ailments (Dubey et al., 2004; Aslam and Sultana, 2015). *Nyctanthes arbor-tristis* Linn (*Nyctaginaceae*) is one of the plants used extensively in the Ayurvedic system of medicine (Saxena et al., 1984; Rathee and Hassarajani, 2007). It is a night flowering sad tree commonly known as 'Harsinghar', 'Prajakta' or 'Night Jasmine'. Whole plant as well as the plant parts of *N. arbor-tristis* are richest source of phytosterols, phenolics, tannins, flavonoids, glycosides and saponins (Singh et al., 1995).

Several crude extracts of different plant part of *N. arbor-tristis* have been used to treat various diseases (Rathod et al., 2010). This plant is known to possess numerous pharmacological effects on the central nervous system activity (Das et al., 2008). Water-soluble portion of the ethanol extracts of flower, bark, seed and leaf have CNS depressant activity (Das et al., 2008).

Till now, no study has been reported to show behavioral parameters using anti-depressant mice model. The present investigation was undertaken to assess the anti-depressant potential of different extracts of *N. arbor-tristis* in mice using force swimming and tail suspension test model.

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