

Involvement of opioid receptors in Boesenbergia pandurata's essential oil (BPEO)-induced antinociceptive activity in animal model of nociception

ABSTRACT

Boesenbergia pandurata is a folklore remedy for relieving stomach, abdominal, joint, and muscular pain. Previous study from our research group has shown that Boesenbergia pandurata's essential oil (BPEO) possesses antinociceptive activity against chemical and thermal models of pain. The present study was conducted to evaluate participation of opioid receptors in BPEO-induced antinociceptive activity. The involvement of opioid receptors was assessed using acetic acid-induced abdominal writhing test. The acetic acid-induced writhing test was conducted by administering the non-selective opioid receptor antagonists (naloxone) 15 minutes before administration of BPEO orally, and selective opioid receptor antagonists (beta-funaltrexamine, norbinaltorphimine, and naltrindole) 1 day before BPEO administration. 0.6% acetic acid was later injected intraperitoneally and 5 minutes after the injection mice were observed for writhing response in 30 minutes time span. It was demonstrated that oral administration of BPEO 300 mg/kg produced 82.19% inhibition of nociception induced by 0.6% acetic acid injection. Opioid receptor antagonists administration solely did not modify acetic acid-induced nociceptive behavior. However, administration of naloxone (non-selective opioid antagonist) significantly increases the nociceptive response of animals receiving BPEO in the acetic acid-induced writhing test. Furthermore, administration of beta-funaltrexamine (mu opioid receptor antagonist) and norbinaltorphimine (kappa opioid receptor antagonist) significantly reserved antinociceptive activity induced by BPEO. Together, these results suggested participation of opioid receptors in inducing antinociceptive activity in animal model. In conclusion, BPEO may exert its antinociceptive activity through activation of mu opioid receptor, as well as kappa opioid receptor.

Keyword: Boesenbergia pandurata; Essential oil; Antinociceptive; Opioid receptor