Characterization and antinociceptive activity (in vivo) of kempferol-3,4′-di-O-α-L-rhamnopyranoside isolated from Dryopteris cycadina

Abstract
Compound 1, isolated from Dryopteris cycadina, was characterized as kempferol-3,4′-di-O-α-L-rhamnopyranoside on the basis of ^{1}H and ^{13}C NMR spectroscopic techniques. On the basis of preliminary screening data for this compound, its antinociceptive activity in different animal models was evaluated. Compound 1 displayed dose-dependent antinociceptive effects with maximum activity of 46.12 % at 10 mg/kg i.p. against acetic acid-induced writhing. In addition, it also showed dose-dependent blockade of noxious stimulation in both phases of formalin test with 40.78 and 43.44 % in the first and second phases at 10 mg/kg i.p., respectively. However, the injection of naloxone did not block the antinociceptive effect of compound 1 and thus ruled out the opioidergic involvement. It is, therefore, concluded with confidence that compound 1, isolated from D. cycadina, provoked strong antinociceptive activity and could be a lead analgesic drug candidate. Moreover, the mechanism of antinociceptive action by different flavonoids has also been investigated; results revealed that the bioactivity of compound 1 analogs should be discussed not only on the basis of flavonoids/biotarget interaction, but also on the basis of the catalytic activity of their bimetallic complexes.