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Analgesic and anti-inflammatory actions of 1,8-cineole and 1,4-cineole.

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1,4-cineol and 1,8-cineole are natural compounds found in essential oils of odorant plants. 1,8-cineole is a major constituent of some essential oils. The main difference between 1,4- and 1,8-cineole is the organization of chemical ring system but not the position of oxygen. There are plenty of research reports on 1,8-cineole compared to 1,4-cineole. Both compounds are classified as monoterpenes and 1,8-cineole is gaining importance as being a ligand for transient receptor potential (TRP) ion channels.

The aim of this study was to evaluate 1,8-cineol and 1,4-cineole comparatively for analgesic and antiinflammatory actions.

Commercially obtained 1,8-cineole and 1,4-cineole dissolved in DMSO were used as test compounds (10, 50 and 100 mg.kg-1 i.p.) for in vivo tail-clip and tail-immersion analgesia tests for analgesia and formaline-induced inflammation. A bulldog clamp for tail-clip tests and constantly heated water (52,5^{o}C) for tail-immersion was used on albino Balb/c mice (25-36 g)(n=7) (1, 2).

Tests were conducted 30 min after the application of test compounds and cut-off time was 15 seconds.

Morphine sulphate (10 mg.kg^{-1} s.c.) was used for standard analgesic drug, naloxone HCl (10^{-6} M) and ruthenium red (10^{-5} M) were used for standard opioid and TRP channels antagonists.

Percent analgesic values of the data were calculated using the formula given below and statistically evaluated using one way variance analysis followed by Tukey HSD test for multiple comparison test. $p < 0.05$ was considered as statistically significant.

% analgesia = {(postdrug latency)-(predrug latency)/(cutoff time)-(predrug latency)} x 100

Paw edema were induced by injection of 20microL % 1 formaline into right paw and equal volume of %0.9 NaCl into the left paw of Balb/c mice for the formaline induced paw edema tests (n=7). Data were obtained using plethysmometer at 0 and 45 minutes and statistically evaluated by the following formula and statistically evaluated using one way analysis of variance followed by Tukey HSD test for multiple comparison (3).

% paw volume = [(right paw volume – left paw volume) / left paw volume)] x 100

All procedures in this study conformed to the animal welfare guidelines of the European Community and were approved by the local ethical committee.

Both compounds were observed to exhibit anti-inflammatory actions but only 1,8-cineole exhibited antinociceptive activity at 100 $mg.kg^{-1}$. Both of the compounds exhibited anti-inflammatory actons at 100$mg.kg^{-1}$ but only 1,4-cineole was active at 50 $mg.kg^{-1}$. It was concluded that 1,4-cineole has more anti-inflammatory activity compared to 1,8-cineole but only 1,8-cineole has antinociceptive actions.

Activities of both compounds were antagonized by ruthenium red suggesting the role of TRP cation channels for the observed activities. Since new ligands are required for the TRP investigations, 1,8- and 1,4-cineole deserves further investigations.

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