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Protective effect of safranal on pentylenetetrazol-induced seizures in the rat: Involvement of GABAergic and opioids systems

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Abstract

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The aim of the present study was to evaluate the effects of safranal, an active constituent of *Crocus sativus* L. stigmas, on seizures induced by pentylenetetrazol. Intracerebroventricular (i.c.v.) microinjection of safranal (4.84, 9.68 and 24.2 μ mol) had no effects on tonic and clonic phases as well as mortality upon seizures induced by PTZ (90 mg/kg body wt., i.p.). Peripheral administration of safranal (72.75, 145.5 and 291 mg/kg body wt., i.p.), however, induced a dose-dependent decrease in the incidence of both minimal clonic seizures (MCS) (145.5 mg/kg body wt., $p < 0.01$) and generalized tonic-clonic seizures (GTCS) (145.5 mg/kg body wt., $p < 0.001$) following PTZ administration. Safranal also increased MCS and GTCS latency, significantly. Percent of protection against GTCS was 30%, 100% and 100% and mortality protection percent was 40%, 100% and 100% for the mentioned doses, respectively. Pretreatment with flumazenil (5 nmol, i.c.v.) and naloxone (5.5 nmol, i.c.v. and 2 mg/kg body wt., i.p.), 15 min prior to safranal administration (145.5 mg/kg body wt., i.p.), abolished the protective effect of safranal on MCS. Flumazenil also decreased the effect of safranal on incidence as well as latency of GTCS, significantly. These effects were not, however, significant for naloxone (5.5 nmol, i.c.v. and 2 mg/kg body wt., i.p.). Results of this study demonstrated that safranal could exert anticonvulsant activity in the PTZ model and this effect may be mediated, at least partly, through GABA_A-benzodiazepine receptor complex. © 2006 Elsevier GmbH. All rights reserved.

Reaxys Database Information

Author keywords

Crocus sativus L.; Flumazenil; Naloxone; Pentylenetetrazol; Safranal; Seizure

Indexed Keywords

EMTREE drug terms: 4 aminobutyric acid A receptor; benzodiazepine receptor; *Crocus sativus* extract; diazepam; flumazenil; morphine; naloxone; pentetrazole; safranal; unclassified drug

EMTREE medical terms: animal experiment; animal model; anticonvulsant activity; article; dose response; drug antagonism; drug mechanism; drug structure; grand mal seizure; latent period; male; mortality; nonhuman; priority journal; rat; tonic clonic seizure

MeSH: Animals; Anticonvulsants; Cerebral Ventricles; *Crocus*; Cyclohexenes; Dose-Response Relationship; Drug; Epilepsy; Injections; Injections, Intraperitoneal; Male; Pentylenetetrazole; Phytotherapy; Plant Extracts; Rats; Rats, Wistar; Terpenes
Medline is the source for the MeSH terms of this document.Species Index: *Crocus sativus*; *Rattus*Chemicals and CAS Registry Numbers: diazepam, 439-14-5; flumazenil, 78755-81-4; morphine, 52-26-6, 57-27-2; naloxone, 357-08-4, 465-65-6; pentetrazole, 54-95-5; Anticonvulsants; Cyclohexenes; Pentylenetetrazole, 54-95-5; Plant Extracts; Terpenes; safranal, 116-26-7
Manufacturers: Drug manufacturer: Tolid Daru, Iran; Fluka; Hoffmann La Roche; Sigma.

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