

جستجو

anticonvulsant

تعداد: 1

تمامی موارد

Tajmah Mombeini - Alcea aucheri: evaluation of its anticonvulsant effect in pentylenetetrazole and maximal electroshock seizures in mice



South marshmallow (Malvaceae) flower extract has anticonvulsant activity in mice

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Introduction

We have already shown in an earlier study that both of single and repeated dose treatment with the aqueous extract of flower of South marshmallow has anxiolytic and, a dose-dependent sedative effects in rats. Our preliminary phytochemical analysis showed the presence of phenolic compounds, polysaccharides, and flavonoids in the extract (1). It is well known that the flavonoids have a selective affinity for central benzodiazepine receptors and some of them possess a pharmacological profile compatible with a partial agonist action (2). On the other hand, GABA_A-ergic drugs are the mainstay of treatments to suppress seizures. They are primary or secondary targets of many of the available anticonvulsant drugs (3). Therefore, this study was designed to investigate the possible anticonvulsant effect of aqueous extract of flowers of South marshmallow in mice.

Methods

Seizures were induced in male adult mice by administration of Pentylentetrazol (PTZ) or Maximal Electroshock (MES). Mice were randomly subjected to receive saline, aqueous extract of flower of *Alcea aucheri* (EFA) (at 8.75, 17.5, 35, 70 and 175 mg.kg⁻¹), or diazepam intraperitoneally (i.p.) 15 or 30 min before intravenous PTZ injection (i.e. PTZ-15, PTZ-30). In another experiment, mice were treated (i.p.) with saline, EFA (8.75, 17.5, 35, 70, 175 and 350 mg.kg⁻¹), or phenytoin 15 or 30 min before the MES test (i.e. MES-15, MES-30). Diazepam and phenytoin were used as reference drugs.

Results

Our findings showed that the extract increased the PTZ seizure threshold (Figure 1). In the MES test, EFA increased the latency to onset of seizure at both time points, decreased seizure duration, protected mice against and reduced the mortality rate (Figure 2, Table 1).

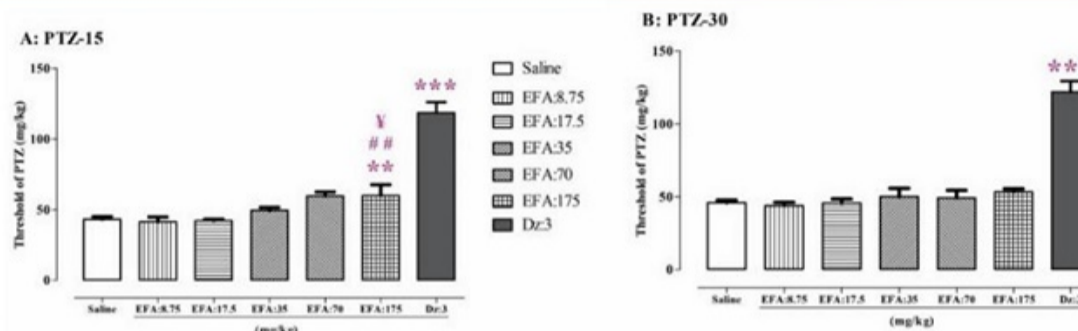


Figure 1. Effect of the aqueous extract of flowers of *A. aucheri* (EFA) on the pentylentetrazole-induced seizure threshold in mice. Data are expressed as Mean \pm SEM and were analyzed by one-way ANOVA followed by the Student-Newman-Keuls post hoc test; **P<0.01 and ***P<0.0001 compared with the saline control group; ¥P<0.05; ##P<0.01 compared with the EFA group (8.75 and 17.5 mg.kg⁻¹, respectively); Dz: Diazepam; PTZ: Pentylentetrazole.

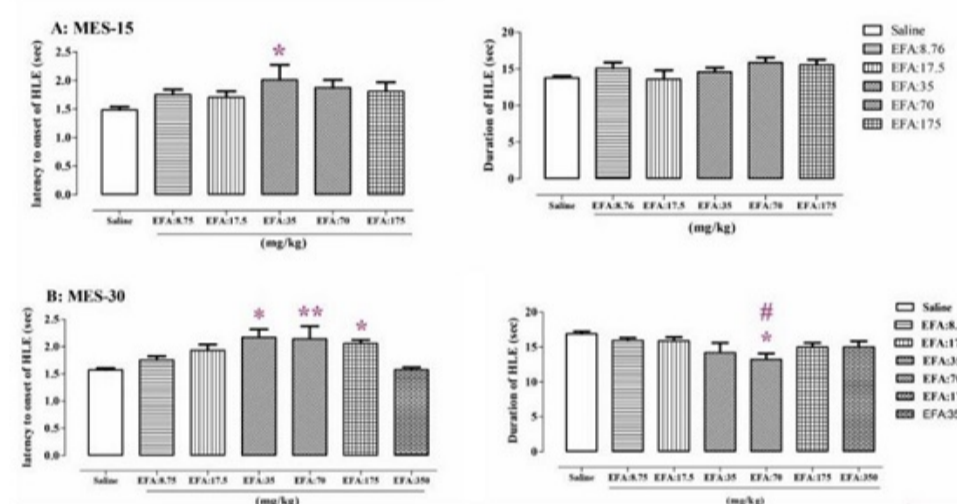


Figure 2. Effect of the aqueous extract of flowers of *A. aucheri* (EFA) on maximal electroshock-induced seizure test in mice. Data are expressed as Mean \pm SEM and were analyzed by one-way ANOVA followed by the Student-Newman-Keuls post hoc test; *P<0.05 compared with saline group; **P<0.01 compared with saline group; #P<0.05 compared with EFA at 8.75 mg.kg⁻¹; HLE: Hind limb extension.

Table 1. Effect of the aqueous extract of flower of *A. aucheri* (EFA) on protection against maximal electroshock (MES)-induced seizure.

Control/Treatment (mg/kg)	MES-15*		MES-30*	
	Seizure protection (%)	Mortality (%)	Seizure protection (%)	Mortality (%)
Saline	0	38.46	0	41.66
EFA: 8.75	0	0*	8.33	8.33*
EFA: 17.5	0	0*	30	0*
EFA: 35	0	0*	30	0*
EFA: 70	0	0*	10	0*
EFA: 175	0	0*	0	0*
EFA: 350	-	-	60*	0*
PHN: 25	100*	0*	100*	0*

Saline, EFA or phenytoin (PHN) were administered intraperitoneally 15 or 30 min before seizure induction (i.e. MES-15, MES-30). The Chi-squared test was used for statistical analysis. aN=6-12; bN=10-12. ¥p<0.05, *p<0.0001, compared with saline group. PHN: phenytoin

Discussion

Conclusion: This is the first report on the anticonvulsant activity of a plant from the genus *Alcea*. The present study revealed anticonvulsant effect of South marshmallow against pentylentetrazole- and maximal electroshock-induced seizure models in mice.

Keywords: South marshmallow, Pentylentetrazole, Maximal electroshock, Seizure

References

- Mombeini, T., Gholami-Pourbadie, H., Kamalinejad, M., Mazloumi, S., & Delipour, A. R. (2017). Anxiolytic-like and sedative effects of *Alcea Aucheri* (Boiss.) Alef. flower extract in the laboratory rat. *Iranian Journal of Pharmaceutical Research*, 16(4), 1495-508.
- Medina, J. H., Viola, H., Wolfman, C., Marder, M., Wasowski, C., & Calvo, D., et al. (1997). Neuroactive flavonoids: New ligands for the benzodiazepine receptors. *Phytomedicine*, 5(3), 235-43.
- Galanopoulou A.S. (2008). GABA_A Receptors in Normal Development and Seizures: Friends or Foes?. *Current Neuropharmacology*, 6, 1-20.