BENEFICIAL EFFECTS OF ESSENTIAL OIL FROM *Pterodon emarginatus* SEEDS IN EXPERIMENTAL AUTOIMMUNE ENCEPHALOMYELITIS

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Introduction: Multiple sclerosis (MS) is a severe chronic T cell-mediated autoimmune inflammatory disease of the central nervous system (CNS). Nowadays, the existing therapy is only partially effective and is associated with undesirable side effects. The use of medicinal plants is ingrowing in the search for novel immunomodulatory compounds. *Pterodon emarginatus* is utilized in popular medicine for the treatment of inflammatory disorders. Essential oil (EO) obtained from *P. emarginatus* seeds is composed of volatile terpenes and phenylpropanoids, mainly, β-elemene and β-caryophyllene sesquiterpenes. However there are no reports about the effects and mechanisms of EO in experimental autoimmune encephalomyelitis (EAE), an established model of MS.

Aim: Here we report the effects and the underlying mechanisms of action of EO from *P. emarginatus* seeds in EAE.

Methods: The EO (50 and 100mg/kg) was administered during induction phase of EAE (day 0 to day 25 post immunization – p.i.). *In vivo* and *ex vivo* immunological responses were evaluated by ELISA, immunohistochemistry, immunofluorescence and flow cytometry. Results: We provide evidence that EO from *P. emarginatus* seeds significantly attenuates neurological signs and development of EAE. Furthermore, EO treatment inhibited neuroinflammation, demyelination and neuronal death, as well as, blocked oxidative damage induced by microglial activation in the CNS during EAE development. *In vitro*, EO consistently inhibited the T cell mediated immune response including the production of Th1 cytokines and up-regulated Treg response. Conclusions: Our findings showed that oral administration of EO consistently reduces and limits the severity and development of EAE. Therefore, EO might represent a potential molecule of interest for MS therapy development.

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