Advances on the Pharmacological use of Teucrium spp. (Germanders)

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Commentary on

Teucrium species, as known Germanders, have been successfully applied for homeostasis glucose and insulin level, pain and spasm relief and treatment of inflammatory disorders, for long years. The most phytochemical analysis of Teucrium species confirmed this genus is rich source of neo-clerodanes diterpenoids, considered as chemotaxonomic markers, followed by flavonoid and aromatic compounds (Shtukmaster et al., 2010).

The paper by Hasani-Ranjbar et al. (2010a) that is a systematic collection of information about traditional uses, accomplished pharmacological animal investigations and clinical trials that have been carried out on Teucrium spp. show promising hope for Teucrium spp. in many diseases. As reported by Hasani-Ranjbar et al. (2010b), the most valuable pharmacological effects of Teucrium species, include antidiabetic, antispasmodic, anti-inflammatory, anti-oxidant and antinecrotic while anti-hyperlipidemic and hepatoprotective properties of Teucrium remain questionable. According to Hasani-Ranjbar et al. (2010a), hepatotoxicity is the most significant side effect caused by furano neoclerodane diterpenoids, mainly tectorin A that are found in T. viscida, T. chamaedrys, T. polium and T. capitatum. Two mechanisms are thought to be involved in hepatitis including transformation of furano ring into toxic reactive epoxides by cytochrome P4503A and secondary immune reactions (Poon et al., 2008). Despite of some case reports about hepatitis after consumption of some Teucrium species, two recent studies (in vivo and in vitro) indicated hepatoprotective action of T. polium. The mechanism of protection is perhaps caused by increasing intracellular glutathione that inactivates toxic epoxides along with increasing other hepatic antioxidant enzymes and decreasing inflammatory factors (Shtukmaster et al., 2010; Amini et al., 2010). Also, Shtukmaster et al. (2010) showed that at low concentrations (0.01-0.25 mg mL⁻¹), an aqueous extract of T. polium, had no effect on cellular integrity while at higher concentrations (0.75-1 mg mL⁻¹) the extract was toxic to HepG2 cells because it inhibited mitochondrial respiration and increased cellular LDH efflux. At concentrations of 0.375 and 0.5 mg mL⁻¹, the extract significantly increased the intracellular glutathione. These findings show that maximal nontoxic concentration of T. polium extract of is between 0.25 and 0.5 mg mL⁻¹. Probably, the flavonoid fraction is responsible for anti-oxidant and hepatoprotective effects of this plant. There is evidence that an increase in the ratio of flavonoid/dipentecord level is affected by different extractions obtained from different locations or season of plant collection (Sghai et al., 2011).

According to the reported data about beneficial and side effects of Teucrium, it is concluded that Teucrium have a low therapeutic index like cardiac glycosides. Since, some species of Teucrium used in some weight loss supplements in combination with other herbal medicines, these products should undergo the safety tests before releasing into market (Herrera and Druguer, 2008). Interestingly, a new study confirmed anti-colitis effect of Teucrium that needs to be followed up in clinic (Abdolghaffari et al., 2010). For minimizing any possible danger of Teucrium supplements, future research should focus on certification of active component, safe and therapeutic doses, pharmacokinetics and side effects especially in long-term administration. Herbal medicines similar to Teucrium species have been successfully entered clinic in the recent years (Hasani-Ranjbar et al., 2010b; Mottaz and Abdollahi, 2010). In the next step, more clinical trials with accurate methodology using standardized products and dosages would be helpful to observe the potential of Teucrium against diabetes, inflammation, ulcer, liver disease and cancers.

REFERENCES


