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Antispasmodic activity of aqueous extract from the Mediterranean brown seaweed, *Dictyopteris membranacea*, on the rat isolated duodenum

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The role of marine organisms, especially seaweed in drug discovery has been greatly enhanced the last few years. The aim of this study was to investigate the effect of aqueous extract from the Mediterranean brown seaweed, *Dictyopteris membranacea*, on the rat isolated duodenum contraction. The aqueous extract was obtained by maceration of marine seaweed in distilled water followed by lyophilization of the filtrates. The final concentrations of the lyophilized extract, ranged from 0.5 to 2.5 mg/ml, were made up daily in the physiological solution. All solutions of spasmogenic substances (acetylcholine and barium chloride) and of the reference antispasmodic drug (alverine) were made up daily from stock solutions. Wistar rats were killed by cervical dislocation and duodenum of 1.5 cm length were removed, cleaned and placed in 20 ml organ bath containing Tyrode solution and maintained at 37°C and constantly oxygenated with 95% O₂ + 5% CO₂. Intestinal responses were recorded using myograph transducer and physiograph (MKIII, Narco Biosystems, USA). The antispasmodic activity of different concentrations of the aqueous extract was tested against two spasmogenic substances acetylcholine (Ach) and barium chloride (BaCl₂). The test substances of aqueous extract from *Dictyopteris membranacea*, were added to the bath in volume of 1 ml two minutes before the spasmogenic substances. In the first part of the experiments, cumulative dose-response curves of Acetylcholine and BaCl₂ were obtained. Dose response curve were repeated after addition of different concentrations of the aqueous extract or of the reference drug, alverine. We established that the aqueous extracts exhibited a significant inhibition of the contractile response induced by acetylcholine or by BaCl₂. Indeed, contractions induced by acetylcholine were reduced by 45% (p<0.05) and 60% (p<0.01) when the aqueous extract was used at 1.25 mg/ml and 2.5 mg/ml respectively. And, contractions induced by BaCl₂ were reduced by 40% (p<0.05) and 72% (p<0.01) respectively in presence of the aqueous extract at concentration 0.5 mg/ml and 1 mg/ml.

In addition to its several biological and pharmacological activities (anti-inflammatory, anti-proliferative, antibacterial and antifungal), The present study revealed that this brown seaweed, *Dictyopteris membranacea*, exhibited a significant antispasmodic activity in the tested in vitro model. It is well known that the aqueous extract of brown seaweed contains polar constituents (polyphenols and sulfated polysaccharides), so further studies must be conducted in order to clarify which constituent of this extract is responsible for this antispasmodic activity.

References: Ben Aoun et al, 2010; El Gamal et al, 2010; Borgi et al, 2009; Tuney et al, 2006; Hayase et al, 1993; Kosovel et al, 1991;