Antioxidant and vasorelaxant properties of Ricinodendron heudelotii aqueous extract and its possible mechanism

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Background: Ricinodendron heudelotii is a plant of the Euphorbaceae family, used in traditional medicine to treat numerous diseases, including high blood pressure. The aim of this study is to evaluate the antioxidant and vasorelaxing effects of the aqueous extract of the stem bark of R. heudelotii. Methods: The pharmacological studies were carried out using the aqueous extract obtained by infusion. The antioxidant capacity of R. heudelotii was made by tests with DPPH (1,1-diphenyl-1-picryl-hydrazyl), ABTS (2,2'-azino-bis (3éthylbenz-thiazoline-6-sulfonic acid), iron reducing capacity (FRAP) and inhibition of nitric oxide (NO) release. In vitro, the vasorelaxing effects of the extract of R. heudelotii on the NO and prostacyclin (PGI2) pathways as well as its involvement on various potassium channels were determined on intact or naked fragments of rat aorta pre-contracted with phenylephrine (10-6 M) or KCl (60 mM). Results: The aqueous extract of R. heudelotii exhibited a remarkable DPPH (EC50: 1.68 µg/ml) and ABTS (EC50: 106.30 µg/ml) and nitric oxide (53.71% inhibition at 1000 µg/ml) radical scavenging activities as well as reducing power. The nitric oxide inhibitor L-NAME and prostacyclin inhibitor indomethacin significantly attenuated the vasodilatory effect of R. heudelotii. Tetraethylammonium could not inhibit the vasodilatory effect of the extract, unlike glibenclamide and barium chloride. Conclusion: R. heudelotii extract possesses antioxidant property and vasorelaxing effect linked to the endothelium related factors, and this relaxation was partially mediated mainly through the inhibition of Kir and KATP channels. Impact of the study: Is to valorise our biodiversity and supply some scientific basis for medicinal plant pharmacology and possibly to contribute to the development of new medicinal products from plants and other natural resources.

Keywords: Ricinodendron heudelotii, antioxidant, vasorelaxant.