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Antihypertensive activity and standardization of the bioactive fraction of hyphaenethebaica growing in Egypt

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Background: Hyphaene thebaica herb is well known in Egypt for its antihypertensive activity. However a standardized herbal extract of Hyphaene thebaica has never been prepared in a pharmaceutical dosage form.

Methods: A biologically guided fractionation was carried out *in-vitro* for the 50% and 70% ethanol extracts of Hyphaene thebaica herb using the Angiotensin Converting Enzyme (ACE) inhibition assay and renin inhibition assay. A validated reversed phase HPLC method was developed for the standardization of the active fractions.

Results: The ethyl acetate fraction of the 70% ethanol extract contained higher percentages of the three compounds chlorogenic acid, quercetin and apigenin (1.940%, 2.994% and 0.612%, respectively) relative to the ethyl acetate fraction of the 50% ethanol extract (1.384%, 0.342% and 0.070%, respectively). Also by comparing all fractions, the butanol fraction of the 70% ethanol extract showed the highest ACE inhibition activity (IC₅₀= 0.001436) and the highest renin inhibition activity (%inhibition= 93.69% at concentration 0.5 mg/ml). A standard calibration curve for the three compounds was established at a concentration range of 0.1-50 µg/ml and it showed good linearity with a correlation coefficient (R²) of (1, 1 and 0.999, respectively). A high degree of precision (relative standard deviation values <5%) was achieved. The limits of detection for the three compounds were 0.428, 0.368 and 0.849 respectively. While the limits of quantification for the three compounds were 1.29, 1.11 and 2.57 respectively.

Conclusion: Current results showed that the butanol fraction of the 70% ethanol extract revealed the highest antihypertensive activity through an ACE inhibition mechanism and renin inhibition mechanism. In addition, recorded observations concerning linearity of the used bioactive markers offer a support for the possible utility of the tested extracts as potent standardized antihypertensive drugs.

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