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Research article

Qualitative and quantitative assessment of cryptolepis-based herbal formulations within the Accra and Kumasi metropolis in Ghana

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Key words: malaria, herbal formulations, *Cryptolepis sanguinolenta*, cryptolepine, HPLC.

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Abstract

Cryptolepis sanguinolenta of the family Asclepiadaceae contains the antimalarial alkaloid cryptolepine. Proliferation of *Cryptolepis*-based formulations in Ghana calls for pharmacovigilance to improve malaria treatment outcomes. The objective of this study is to qualitatively and quantitatively assess Cryptolepis-based formulations on the Ghanaian market. Fourteen registered brands of *Cryptolepis*-based aqueous formulations were purchased from pharmacies and herbal shops within the Accra and Kumasi metropolis of Ghana. The brands were coded A to N. Phytochemical, packaging and labeling assessments were performed. Microbial contaminations were assessed using the pour plate method. The cryptolepine content in each sample was determined using reverse phase HPLC and was compared using one way ANOVA followed by Bonferroni *post hoc* multiple comparison test. Samples were screened for possible antimalarial adulterants such as artemether, lumefantrine, artesunate and amodiaquine. None of the brands met the standard packaging and labeling requirements. Brands B, G and M passed the microbial contamination limit test whilst the rest failed. Glycosides, tannins, saponins, and sterols in addition to the alkaloids were detected. Cryptolepine was present in all brands except E and F. Batch 1 of brand M had the highest cryptolepine content (0.324 ± 0.043 mg/ml). There were significant ($P \leq 0.05$) variations in the cryptolepine content of the different batches of brands B, I, M and N. Artemether, lumefantrine and amodiaquine were not detected. Eleven of the fourteen brands gave positive test for artesunate. All the brands were defective in one or more of the basic requirements of pharmaceutical formulations. Eleven brands may have been adulterated with artesunate.