

Chemical analysis, antioxidant and antiplasmodial activity of Annonaceae essential oils from Cameroon

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Malaria causes enormous medical, economic, and emotional burden in the world. New and improved treatments for malaria are needed. Plants used in traditional medicines may offer a promising source of antimalarial lead compounds. In this study twenty essential oils were extracted by hydrodistillation from the fruits, leaves, stem bark, seeds, roots and woods of fifteen Cameroonian Annonaceae species (*Xylopi aethiopica*, *Xylopi parviflora*, *Xylopi quintasii*, *Xylopi staudtii*, *Xylopi phloiodora*, *Monodora brevipes*, *Monodora myristica*, *Uvaria angolensis*, *Uvariadendron calophyllum*, *Polyalthia suaveolens*, *Hexalobus crispiflorus*, *Annona senegalensis*, *Pachypodanthium confine*, *Cananga odorata* and *Enantia chlorantha*). Their chemical analysis was conducted using gas chromatography coupled with mass spectrometry. The antioxidant properties were evaluated using standard methods and the antiplasmodial activity against the W2 strain of *Plasmodium falciparum* was tested in culture. The yields of essential oils extraction ranged from 0.02% to 4.2%. Chemical analysis revealed a predominant terpenic composition, with a majority of sesquiterpenoids in most of the cases (>87%), and various structures with diverse functions. From the evaluation of antioxidant activity, four essential oils from the stem bark of *Uvariadendron calophyllum*, *Pachypodanthium confine*, *Enantia chlorantha* and *Xylopi staudtii* showed prominent scavenging activity with respective IC₅₀ of 3 mg/ml, 4 mg/ml, 4.7 mg/ml and 4.9 mg/ml. Among the antiplasmodial extracts, two from the stem bark of *Xylopi staudtii* and *Enantia chlorantha* were found to be of interest, taking into account their respective radical scavenging activities. The results achieved indicate that essential oils may offer a promising alternative for the development of new antimalarials.

Preformulation study of natural bioflavonoid: Hesperidine, promising antioxidant for pharmaceutical formulations

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Hesperidin is abundantly found in citrus fruits (family *Rutaceae*). Hesperidin holds potential in treating age-related macular degeneration, cataract and diabetic retinopathy. Additionally, it has been demonstrated that hesperidin can decrease blood cell and platelet aggregation, believed to be beneficial in cases of capillary permeability and fragility. The overall goal of this study was therefore to determine the influence of several factors on the stability of hesperidin in solution to obtain information that would facilitate the subsequent development of topical and ophthalmic formulations. Our first objective was to determine the influence of pH, temperature, and ionic strength on the aqueous stability of hesperidin. A second objective was to determine the stability of hesperidin in various solvents in the presence and absence of different antioxidants. A simple and rapid stability indicating high-performance liquid chromatography assay for hesperidin was developed. Stability studies were performed in 0.05 M aqueous buffers at pH 3, 5, 7, and 9 at 4, 25, and 50°C. The effect of ionic strength on hesperidin stability was evaluated in 0.05 M acetate buffer, pH 5, adjusted to the desired ionic strength with sodium chloride. An accelerated stability study of hesperidin was performed at 50°C in the organic solvents glycerine and transcitol P in the presence of antioxidants. The degradation of hesperidin increased rapidly as temperature and solution pH were increased. Ionic strength increases also caused an accelerated degradation. The addition of 0.1% concentrations of several antioxidants in combination with EDTA caused variable effects on hesperidin stability.

Keywords: Hesperidin, High-performance liquid chromatography, Stability, Antioxidant

Biography

Mukesh Sharma completed his B.Pharm from RUHS Jaipur in 2009 and earned M.Pharm in Pharmaceutics & Pharm.Technology from L. M. College of Pharmacy, Ahmedabad, India, in 2012. Currently pursuing Ph.D. in Pharmaceutics from Shah-Schulman Center for Surface Science & Nanotechnology, Nadiad, Gujarat, India. He has 1 publication to his account. He has 1 year of research experience.