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Short Note on Phytochemical, antioxidant and anticholinesterase profiles of *Musanga cecropioïdes*

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Abstract

This study is devoted to *Musanga cecropioides* (Urticaceae), a tropical plant whose leaves and root bark are used in traditional medicine in the treatment of various pathologies. The objective of this work was to study qualitative and quantitative composition of phenolic compounds in extracts of the leaves (McF) and root bark (McR) *Musanga cecropioides* and to evaluate their antioxidant and anticholinesterase properties. Phytochemical screening using TLC showed that the extracts contain, along with phenolic compounds such as coumarins, flavonoids and tannins, other bioactive phytocompounds namely sterols, terpenes and alkaloids. Quantitative analysis of phenolic phytoconstituents by spectrophotometry showed that contents of total flavonoids and polyphenols in leaves (7.753% and 119.389 mg EAG / g, respectively) are higher than those in the root bark (1.41% and 105.944 mg EAG / g, respectively). The antioxidant activity of total and selective extracts evaluated by FRAP and DPPH methods was found to be significant compared to vitamin C. All the extracts of *Musanga cecropioides* showed good anticholinesterase activity with percentages of inhibition of the Acetylcholinesterase (AChE) ranging from 51.952 to 63.589%.

Keywords:
***Musanga cecropioids*, Chemical composition, Antioxidant, Anticholinesterase activities.**

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Introduction

The Urticaceae family, with more than 2000 species of morphological diversity, is distributed in tropical and temperate regions, with the majority of general and species in tropical Asia. They are herbaceous plants, usually deciduous and sometimes creepers shrubs. The *Musanga cecropioïdes* (Urticaceae) species, widespread in the tropical forests of Africa from Guinea to the Congo Basin [1], is a plant used in traditional medicine in West and Central Africa for the treatment of pathologies such as constipation, rheumatism, cough, schizophrenia, lung infections, leprosy, high blood pressure and malaria [1,2]. Numerous scientific studies have shown that extracts from the various organs of *M. cecropioides* exhibit hypotensive, hypoglycemic, antidiabetic, antidiarrhoeal and antibacterial properties [3-6]. In Côte d'Ivoire, according to information gathered from ethnobotanical surveys, the root bark of *M. cecropioides* are used to treat mental illnesses. In view of this virtue of *M. cecropioides*, we took an interest in it, and this, by considering studying chemical composition of its organs and their inhibitory activity of Acetylcholinesterase (AChE). Phytocompounds such as alkaloids, terpenoids, cardiac glycosides, saponins and coumarins have a beneficial effect on the central nervous system by increasing the activation of cholinergic neurons and stimulating cognitive functions such as Acetylcholinesterase inhibitors (AChE) [6,7]. This makes it possible to consider them promising in the prevention of neurodegenerative diseases of the Alzheimer type. Indeed, cholinergic deficiency is a hallmark of Alzheimer's Disease (AD), which is associated with the selective death of cholinergic neurons in the initial stages of the disease. We know that the brain is more sensitive to damage caused by free radicals than other tissues. The effectiveness of antioxidant system in the brain gradually decreases with aging, and in the brains of patients with AD, this decrease occurs even more strongly. All of this determines the advisability of using natural antioxidants in the prevention and treatment of AD.

Musanga cecropioids

Plant material

The plant material consists of the leaves and root bark of *M. cecropioides* (Cecropiaceae) collected in Zokolilié (Lakota, south-western Côte d'Ivoire), and identified at the National Floristic Center (CNF) of Abidjan under the No. 17543. After cleaning with water and drying in a ventilated room for 15 days, the organs were pulverized using an electric grinder and kept in tightly closed glass jars.

Preparation of extracts

20 g of powder macerated in 150 ml of MeOH (80% v/v) for 24 hours. The operation is repeated three times. After reduction by simple distillation, 2/3 of the filtrate is kept in an oven at 50 ˚C for 24 hours to obtain the total hydromethanolic extracts of the leaves (McF) and of the roots (McR). A selective liquid / liquid extraction of 1/3 of the filtrate was carried out with solvents of increasing polarity to obtain the extracts with hexan (McF^{I} McR^{I}), chloroform (McF^{II} McR^{II}), ethyl acetate (McF^{III} McR^{III}) and n-butanol (McF^{IV} McR^{IV})).

Qualitative analysis by TLC

The phytochemical screening was carried out on chromatoplates (aluminum support, silica gel 60 F254, thickness 0.2 mm; Merck) according to the identification methods taken from the literature. The different developing agents used are: n-C^6H14 / AcOEt, 6: 1.5 (v/v) for the hexane extracts; CHCl3 / AcOEt / n-C6H14, 5: 5: 2.5 (v/v/v) and CHCl3 / AcOEt / n-C6H14, 5: 5: 7.5 (v/v/v) for the chloroform extracts; (CHCl3 / AcOEt / CH3COOH, 4: 5: 2 (v/v/v) ethyl acetate extracts and MeOH / CH3COOH, 4: 0.5 (v/v) n-butanol extracts.

Depending on type of secondary metabolites to be revealed, specific reagents used are Liebermann-Bürchard reagent for sterols and terpenes; sulfuric vanillin; Godin's reagent for sterols, terpenes and flavonoids, 5% (v/v) methanolic KOH for coumarins; AlCl3 for flavonoids; Dragendor'ff's reagent for alkaloids; 2% (v/v) FeCl3 for tannins and phenolic compounds.

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