CENTRE D'ETUDE ET DE RECHERCHE MEDECINS D'AFRIQUE
www.medecins-afrique.org
Research, Training & Scientific Resources for the Socio-Medical Development of Africa

Ref : CERMA2009E2

Toxicological and therapeutic efficacy assessment of *C. siamea* antimalarial Congolese traditional preparation and antiplasmodial *in vitro* activity of its isolated fractions and compounds

G.F. Nsonde Ntandou [a,b,c], M. Ndounga [a], J.T. Banzouzi [b,d], B. Mbatchi [a,b], R.D.G. Elion-Itou [a], A.W. Etou-Ossibi [a], S. Ramos [d], F. Benoit-Vical [e,f,g], A.A. Abena [a] and J.M. Ouamba [h]

a Laboratoire de Biochimie et Pharmacologie, Faculté des Sciences de la Santé, Université Marien NGOUABI, Brazzaville, B.P. 69, Congo
b Centre d'Etude et de Recherche Médecins d'Afrique (CERMA), B.P. 45, Brazzaville, Congo
c Laboratoire de Pharmacologie, Centre d'Etudes sur les Ressources Végétales (CERVE), B.P. 1249, Brazzaville, Congo
d Institut de Chimie des Substances Naturelles (ICSN-CNRS), 1 Avenue de la Terrasse-Bat 27, 91198 Gif-sur-Yvette Cedex, France
e Service de Parasitologie-Mycologie, Centre Hospitalier Universitaire de Rangueil, Université de Toulouse et Faculté de Médecine de Rangueil, Université de Toulouse III, UPS, TSA 50032, 31059 Toulouse Cedex 9, France
f CNRS, LCC (Laboratoire de Chimie de Coordination) UPR8241, 205, route de Narbonne, F-31077 Toulouse, France
g Université de Toulouse III, UPS, LCC, 118, route de Narbonne, F-31077 Toulouse, France
h Unité de Chimie du Végétal et de la Vie, Faculté des Sciences, Université Marien Ngouabi, Brazzaville, B.P. 69, Congo

5th MIM Pan-African Malaria Conference, 2-6 November 2009, Nairobi, Kenya

Abstract

The active antimalarial drugs nowadays certainly could become inactive in the future. It is necessary to develop new drugs, to associate to those already existing in order to minimize the speed of appearance of resistances, or to replace the drugs which are becoming ineffective against *Plasmodium falciparum*. Developing drugs from natural products may reduce the risk of toxicity and maintain its therapeutic effectiveness, when the drug is used clinically. To contribute to the safety of 80% of Africans without access to modern health care, we have studied the toxicity, established the antimalarial propriety of *Cassia siamea*, an African antimalarial traditional medicinal plant and determined their potential as sources of new antimalarial drugs. Water, ethanolic, dichloromethane and petroleum ether *C. siamea* stem bark extracts were assessed for acute and subchronic toxicities on Wistar rats (n = 5), and for cytotoxicity on KB (human epidermoid carcinoma) and Vero (African green monkey kidney) cells. Therapeutic efficacy of traditional extract was conducted in patients suffering from P. Falciparum uncomplicated malaria, who normally and freely use this traditional treatment in south of Brazzaville-Congo. In vitro study was conducted on human erythrocytes infected by FcM29-Cameroon, a chloroquine-resistant strain of P. falciparum. The chemical following techniques were used: reaction tube for chemical screening, flash chromatography, preparative HPLC, CCM preparative, precipitation and crystallization for the fractionation and isolation. The structures of some compounds were assigned from spectroscopic evidence and comparison with published data. Petroleum ether and dichloromethane extracts LD50 were 1250 and 1300 mg/kg, respectively. These extracts are not cytotoxic particularly the water and ethanol extracts. There is no difference on the biochemical parameters between the traditional extract and control: glucose (87.2±3.31–220±4.99 mg/dl); AST (4.6±0.67–9.6±0.57 UI/dl); ALT (6.2±0.42–12.6±0.84 UI/dl); creatinin (3.16±0.40–3.9± 0.38 UI/dl); Ht (31.2±1.08–33.6±0.48%). 85% treatment success with a significant reduction of parasitemia from the third day were observed with the extract traditional, which seems the standard drug (quinine). 38 fractions and 29 molecules in vitro, six fractions isolated IC50 (0.4–2_g/ml) and two molecules not yet identified IC50 (0.3–1.2_g/ml) exhibited most antiplasmodial activity. Following molecules: lupeol, betuline, betuline acid, stigmasterol, ursolic acid, oleanolic acid, emodin and barakol, already known about this plant have not shown a major antiplasmodial effect IC50 (>25_g/ml). *C. siamea* is a medicinal plant that can provide new tolerated antimalarials molecules. It is essential to study the interaction of these pharmacological active compounds with chloroquine.