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Komunikasi Pendek/*Short Communication*

In vitro Antiplasmodial Activity and Cytotoxicity of Ten Plants Used as Traditional Medicine in Malaysia

(Aktiviti Antiplasmodium dan Sitotoksisiti Secara *In vitro* Sepuluh Tumbuhan yang Biasa Digunakan dalam Rawatan Tradisional di Malaysia)

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ABSTRACT

Dichloromethane and methanolic extracts of each plant were tested for their antiplasmodial activity on chloroquine-resistant strain of Plasmodium falciparum (FCB strain), based on lactate dehydrogenase activity. Cytotoxicity was assessed with the MTT test on MRC-5 human diploid embryonic lung cells. Most extracts of ten selected plants used in Malay traditional medicine in Malaysia had activity in vitro. This supports continued investigations of traditional medicine in the search for new antimalarial agent. The compounds responsible for the observed antiplasmodial effects are under investigation.

Keywords: Plasmodium falciparum, Plant, Antiplasmodial activity, Cytotoxicity, Malaysia.

ABSTRAK

Ekstrak diklorometana dan metanol setiap pokok telah diuji aktiviti antiplasmodium terhadap Strain Plasmodium falciparum yang rintang klorokuin (Strain FCB) berdasarkan aktiviti dehydrogenas laktat. Sitotoksisiti diukur melalui ujuan MTT pada sel paru-paru embrionik diploid manusia MRC-5. Kebanyakan ekstrak sepuluh tumbuhan yang digunakan dalam perubatan tradisional Melayu mempunyai aktiviti secara in vitro. Ini menyokong penelitian berterusan perubatan tradisional dalam pencarian agen antimalaria baru. Sebatian yang memperlihatkan kesan antiplasmodium, sedang dalam penyelidikan.

Kata kunci: Plasmodium falciparum, Tumbuhan, Aktiviti antiplasmodium, Sitotoksisiti, Malaysia

Despite decades of intense research, malaria remains a deadly worldwide disease. Drug-resistance to limited available antimalarials, in part, has contributed to the persistence of this infectious disease. Likewise, the use of antimalarials such as artemisinin, though effective in global malaria control programs, is hampered by high cost and limited supply (World Health Organization 2008). Therefore, identification of an antimalarial drug that is easy to isolate and produce, is inexpensive, and demonstrates little toxicity across a diverse population represents the ideal agent needed for global malaria control programs and eradication of this deadly disease. These compounds have exhibited promising antimalarial activities *in vitro* and *in vivo* (Wan Omar et al. 2007). However, limitations such as toxicity, low bioavailability and/or poor solubility have probably restricted the scope of use for several plant products in humans. (Lee et al. 2009; Rajakumar & Shivana 2009). Plants provide novel leads, which can be developed into safe drugs by synthetic strategies as exemplified by artemether and quinoline class of antimalarials (Kaur et al. 2009). In this direction, semi synthetic approaches to newer and modified antimalarials have provided useful insights into their applicability in antimalarial drug discovery. As part of a project to identify new compounds active on malarial parasites, we tested the in vitro antiplasmodial activity of ten plants traditionally used to treat malaria and fever in Malaysia. The ethanobotanical information of the ten selected plants obtained from Malay traditional healers (bomoh) are indicated in Table 1. The protocol of traditional preparation and of use of each tested plant were obtained from notices of these traditional healers.

The plant materials were extracted first with dichloromethane and then with methanol. The amount of solvent was at least 10 times the volume of plant material. Filtrates were prepared and evaporated to dryness under reduced pressure with a rotary evaporator (Rotavapor®) at 30°C.

Plasmodium falciparum strain FCB (chloroquine-resistant) was grown under standard conditions as previously described (Trager & Jensen 1976). The parasites were synchronized by repeated 5% sorbitol treatment. The plant extracts were dissolved in 100 L of DMSO at an initial concentration of 200 mg/ml and then serially diluted with culture medium before being added to synchronous parasite cultures. The concentration range was 500–0.05 g/ml. Two hundred microliters of synchronized trophozoite suspension