In vitro antiplasmodial activity, macronutrients and trace metals in the medicinal plants: Phyllanthus spp. and Alpinia conchigera Griff.

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Abstract. An antiplasmodial screening of Phyllanthus debilis and Phyllanthus urinaria was carried out. The medicinal plants were extracted and evaluated for in vitro antiplasmodial activity against D10 (chloroquine-sensitive, CQS) and Gombak A (chloroquine-resistant, CQR) strains of Plasmodium falciparum. The methanolic crude from the soxhlet extraction were active against both strains however, P. urinaria (IC₅₀ 8.9 µg/ml with CQR strain) exhibited better anti-malarial activity compared to P. debilis (IC₅₀ 12.2 µg/ml with CQR strain). Furthermore, the methanolic crude of P. urinaria obtained by the cold extraction has good anti-malarial activity towards CQS (IC₅₀ 4.1 µg/ml). The concentration of macronutrients (calcium and magnesium) and trace metals (copper, manganese, iron and zinc) from three Phyllanthus species i.e. P. debilis Kleim ex Wild, Phyllanthus niruri L. P. urinaria L. and Alpinia conchigera Griff. were determined using microwave digestion method and analyzed by Flame Atomic Absorption Spectroscopy. Standard Reference Material 1547 (peach leaves) was used to validate the method throughout this study. The recovery values were in the range of 80% to 120% which were in very good agreement with the certified values. The three Phyllanthus species and leaves of A. conchigera showed the highest concentration of calcium compared to other metals and macronutrients studied. The significant presence of all the important macronutrients and trace metals which are essential for human health and well-being substantiate their use medicinally in traditional practices.

INTRODUCTION

Active compounds of the plants are metabolic products of plant cells and a number of trace elements play an important role in the metabolism (Rajurkar & Damane, 1997). In the past decade, studies have shown that medicinal plants are consumed worldwide for the treatment of several diseases such as diabetes (Ebrahim et al., 2012), high blood pressure (Subramanian et al., 2012) and hepatitis B (Ong & Nordiana, 1999). In addition, medicinal plants are important raw materials in pharmaceutical industries i.e. for the production of phytopharmaceuticals (Ajasa et al., 2004). Recently, medicinal plants play vital role in traditional medicine and are widely consumed as home remedies. Most herbal medicines have low side effects compared to the synthetic drugs and as well as the cost is cheaper than the conventional drugs (Ajasa et al., 2004). Rai et al. (2001, 2005) have studied macronutrients and trace element content in Phyllanthus spp. species and in Alpinia species, as well as heavy metal accumulation in A. galanga. The macronutrients and trace metal concentration in Phyllanthus niruri have been reported by