

Preliminary phytochemical screening of the medicinal Plant *Adenanthera pavonina* and its morphological variation

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Abstract

Adenanthera pavonina L. (vernacular: Madatiya) is a medicinal plant, belongs to family Fabaceae. It is widely used for the treatments of many diseases in various therapeutic systems including Ayurveda. The medicinal uses and the distribution of the species were studied using a structured questionnaire survey considering 100 sample population. Morphological characters were analyzed using the specimens collected from their natural habitats to infer the phenetic relationships and has shown no variations with respect to their habitat differences. Qualitative phytochemical analysis was done to identify the chemical compounds present in the stem bark extracts of different solvents such as hexane, chloroform, methanol and water. Phytochemical screening of stem barks of the different samples confirms the presence of phytochemicals; alkaloids, flavonoids, glycosides, tannins, steroids, and saponins in the extracts of the methanolic, chloroform and water. This study draws attention to the need of further analysis of the active principles of the species in order to understand their mode of action in different diseases.

Introduction

Adenanthera pavonina, belongs to family Fabaceae, is earlier reported as endemic to India. However, the tree has been introduced throughout the humid tropics. Therefore, it has become naturalized in Malaysia, Western and Eastern Africa and most island nations of both Pacific and the Caribbean [1]. It is also introduced in the American countries. Currently *A. pavonina* is cultivated in all the tropics. There are two *Adenanthera* species available in Sri Lanka known as *A. pavonina* (vernacular: Madatiya) and *A. bicolor* (vernacular: Mas mora). The latter is endemic species and found in wet, South East area of Sri Lanka specifically in Sinharaja forest reserve. In Sri Lanka *A. pavonina* is commonly found in low country up to 1300m altitude. This species is cultivated and was reported in Kandy, Kalutara, Ratnapura, Badulla, Gampaha and Colombo districts [2].

The entire plant of *A. pavonina* is used for its timber value, medicinal properties, an ornamental garden plant and shady

tree. This tree is useful for nitrogen fixation therefore often cultivated for forage. Seeds are used as beads in necklaces and also used as a measuring unit in weighing ingredients in medicinal preparations [3].

From ancient time, plants are known as rich source of effective and safe medicines. Herbal medicines have been main source of primary health care in many nations. About 80% of world population is still dependent on traditional medicines [4]. In traditional societies, nutrition and health care are strongly interconnected and many plants have been consumed both as food and for medicinal purposes [5]. Medicinal plants are natural sources of compounds that can be used against many diseases today. Plants and plant based medicaments are the basis of many of the modern pharmaceuticals use for various ailments.

Phytochemicals are naturally occurring secondary metabolites produced in plants that help to provide their characteristic odor, flavor, smell and texture of plants. Apart from that phytochemicals are used to control diseases including cancer and cardiovascular diseases and to inhibit pathogenic microorganisms [6,7]. These phytochemicals work with nutrients and fibers to form an integrated part of defense system against various diseases and stress conditions (8). The most important bioactive constituents present in plants are alkaloids, tannins, flavonoids, steroids, terpenoids, carbohydrate and phenolic compounds [9].

In terms of medicinal uses, the seeds of *A. pavonina* have been found to be effective in treating cardiovascular diseases in pregnancy. The ground seeds are used to treat boils and inflammatory reactions. Decoction of leaves is used to treat gout and rheumatism [10]. Methanol extract of seeds has been evaluated for pharmacological effects in animal models, and the study demonstrated the anti-inflammatory and analgesic effect [11]. In Sri Lanka *A. pavonina* is mentioned in herbal formulations practiced among traditional ayurvedic practitioners, and in different drug preparations in ayurveda pharmacopeia. Different parts: bark, leaves, seeds and roots of the tree are used for

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