Editorial

The Potential Medicinal Uses of *Cassia tora* Linn Leaf and Seed Extracts

The annual herbaceous undershrub *Cassia tora* Linn (Family Leguminosae), which is also known as sicklepod, has a widespread occurrence in tropical countries [1]. Over two centuries ago, its economic use in the manufacture of dyes was described in *The Philosophical Magazine* (May 1808); in Bangalore, its seeds were used as components of what were locally called the niligaru class of dyes, the name being derived from nila for indigo. With the recent move towards searching for eco-friendly natural dyes, the viability of using *Cassia tora* L. seed extract, which is particularly rich in emodin (4,5,7-trihydroxy-2-methyl anthraquinone), rhein (1,8-dihydroxy anthraquinone-3-carboxylic acid) and chrysophanol (1,8-dihydroxy-3-methyl anthraquionone), as a natural dye for cotton and silk is again under investigation [2].

*Cassia tora* Linn has been the subject of published scientific studies for well over a century. For example, in the nineteenth century, the leaves (and leaflets) of living *Cassia tora* plants were the subject of innovative botanical physiological studies by Macfarlane, of the University of Pennsylvania, on the reaction of higher plants to different coloured lights. Macfarlane published the results of these experiments on paraheliotropism in 1895 in *Botanisches Centralblatt* (Bd. 61) in an article entitled “The Sensitive Movements of some Flowering Plants under Colored Screens” [3]. *Cassia tora* has been used in traditional Chinese medicine [4] and in indigenous Indian medicine, the plant being known as Chakvat, Chakunda and Charota in Hindi [5, 6].

In recent decades, extracts from the leaves of *Cassia tora* Linn (Family Leguminosae) have been found to have potentially beneficial antioxidant and antigenotoxic actions, the degree of such actions (or even prooxidant activity) depending, at least in part, on whether or not they are roasted, and, if so, the temperature of such roasting [7, 8]. Depending on the nature of the chemical extraction used, the leaves of this plant have been shown to contain a number of active phytochemical constituents, including reducing sugars, tannin, flavonoids, sterols, saponin, and anthraquinone [1].

*In vitro* studies on murine liver and brain preparations have confirmed that leaf extracts are likely to be active against diseases mediated by free radicals [9, 10]. Murine experiments have also demonstrated that one extract, ononitol monohydrate (a class of glycoside) has potent hepatoprotective actions [11]. Leaf extracts may also protect against mosquito bites [12], ultraviolet-B-induced psoriasis [13], and cataaract [14], as well as offering a treatment option for cataracts and certain other ophthalmological conditions [15, 16]. It has recently been suggested that leaf extracts should be further investigated for potential therapeutic roles in Alzheimer’s disease, owing to their anti-amloidogenic and muscarinic actions [17].

It is not only the leaves of this plant that have been found to have medicinal properties. Other parts of the plant, including, in particular, its seeds, also appear to have potentially beneficial therapeutic uses. In 1965, Tewari and colleagues reported that the fatty acid composition of *Cassia tora* seed oil is approximately 40% oleic acid, 36% linoleic acid, 10% lignoceric acid, 8% stearic acid and 7% palmitic acid [18]. Seed extracts have been reported to have anti-cancer, anti-diabetic, anti-inflammatory, anti-fungal and anti-bacterial properties [19, 20]. They may also possess mosquito larvicidal activity [21]. Intriguingly, given the current worldwide problem of obesity, it is of great interest that seed extracts have been reported not only to alleviate high-fat diet-induced non-alcoholic fatty liver [22], but also to reduce the storage of lipid itself in white adipose tissue, through the activation of the enzyme AMP (adenosine monophosphate)-activated protein kinase (AMPK) [23].

In light of the many potentially beneficial actions of *Cassia tora* leaf extracts, it is clearly highly important that the safety of *Cassia tora* supplementation be studied. The paper by Kambalachen and colleagues in this issue of *Reviews on Recent Clinical Trials* addresses this directly and is highly recommended [24]. They have carried out a randomized, double-blind, placebo-controlled crossover study in 60 healthy humans, lasting 24 weeks for each treatment phase. This well designed important study showed that *Cassia tora* supplementation was well tolerated and did not cause adverse changes in the measured safety indices. These results should give researchers and clinicians the confidence further to explore the potential beneficial therapeutic actions of this most remarkable plant.

REFERENCES


---

Basant K. Puri  
Department of Medicine, Imperial College London, Hammersmith Hospital, London W12 0HS, England, UK  
E-mail: basant.puri@imperial.ac.uk