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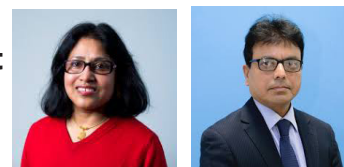
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Guest Editorial

'Gandho badali' (*Paederia foetida* L.): Horrendous smell, but tremendous medicinal value

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'Gandho badali' (*Paederia foetida* L.) (Fig. 1), a well-known medicinal plant from the family Rubiaceae with a fetid smell, is indigenous to Bangladesh, but also native to several other South- and Far-Eastern Asian countries like Bhutan, Cambodia, China, India, Indonesia, Japan, Laos, Malaysia, Nepal, South Korea, Taiwan and Vietnam (Chanda et al., 2015; Global Invasive Species Database, 2021). In addition to the Bengali name 'Gandho badali', this perennial climber is also commonly known as 'Gandhobadulia', 'Kings tonic', 'Skunkvine', 'Stinkvine' an 'Chinese fever vine'.

for the treatment of arthritis, diarrhoea and spasms, and recommended as a diaphoretic, diuretic, emetic, expectorant and stomachic agent (Chauhan et al., 2010). Some ethnopharmacological applications also include its use for the treatment asthma, diabetes, gout, piles, and seminal weakness. It is one of the main components of the commercially available Ayurvedic preparations 'Balarista' and 'Dasmularishta'. Aside from its medicinal uses, *P. foetida* leaves are used in cooking, especially in Bangladesh and India.

Traditional uses of this plant as a remedy for stomach



Fig. 1. 'Gandho badali' plant.

This plant has long been used in traditional medicine, particularly in Bangladesh and India, for the treatment of various human diseases (Chauhan et al., 2010; Chanda et al., 2015). While the whole plant is used for the treatment of dysentery, the Garo tribe in Bangladesh considers the leaves of *P. foetida* as a good remedy for stomach ailments including diarrhoea and stomach ulcers. Fruits of this plant are used to treat toothache. In the Ayurvedic medicine, this plant has been indicated

ailments have prompted extensive *in vitro* and *in vivo* pharmacological studies (Chauhan et al., 2010; Soni et al., 2013; Wang et al., 2014; Chanda et al., 2015; Patel, 2017; Chung et al., 2021; Li et al., 2021) over the years revealing its effectiveness against various medical conditions, e.g., rheumatism, diarrhoea and dysentery, and its pharmacological properties including antihyperglycemic, anti-inflammatory, antimelanogenic, antioxidant, antitussive cancer-chemopreventive and

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hepatoprotective activities. This plant has also been shown to be effective in enhancing sexual vigour and as a tonic. The potential of this plant is not only confined to its medicinal and food values, but also is evident from its plausible applications in cosmetic products, particularly as an antiwrinkle agent (Chung et al., 2021; Ha et al., 2021).

Phytochemical investigations on this plant established the presence of alkaloids, anthraquinones, coumarins, iridoids, lignans, phenolics, steroids and terpenoids (Wang et al., 2014; Ramadhan et al., 2021). Aizarin, asperuloside, campesterol, 1,3-dihydroxy-2-methoxyanthraquinone, digiferrol, ellagic acid, epifriedelinol, friedelin, lupeol, morindaparvin A, paederoside, paederosidic acid, sitosterol, stigmasterol and ursolic acid are the major secondary metabolites found in various parts of *P. foetida* (Soni et al., 2013; Ramadhan et al., 2021). Many of these compounds isolated from *P. foetida* are bioactive, and have been shown to possess several bioactivities, for example, anthraquinones isolated from this plant possess anthelmintic, antidiarrhoeal, antihyperglycemic, antihyperlipidemic, anti-inflammatory, antioxidant, antimicrobial and antitussive properties (Ramadhan et al., 2021; Trung et al., 2021). Although the strong unpleasant smell is mainly due to the presence of several simple sulphur compounds (the major one being dimethyl sulphide), a sulphur containing glycoside, paederoside (Fig. 2), has also been implicated to its bad smell.

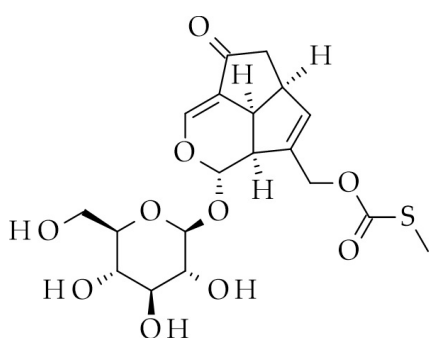


Fig. 2. Structure of paederoside.

In recent years, the focus has shifted to more mechanistic studies, trying to understand how the extract and purified compounds from *P. foetida* exert their pharmacological actions. For instance, Chung et al. (2021) studied the antimelanogenic property of the extract of this plant on murine melanoma cells and have shown that this effect is produced via MAPK (mitogen activate protein kinase) signaling-mediated MITF (microphthalmia-associated transcription factor) downregulation. Similarly, Pradhan et al. (2019) demonstrated that this plant could induce anticancer activity by interfering with chromatin modification enzymes and changing pro-inflammatory cytokine gene expression in prostate cancer cells. Pharmacological studies performed on *P. foetida* to date have provided some scientific evidence in support of its uses in the traditional medicine for the treatment of certain human ailments, and some of the possible mechanisms of action have also been demonstrated. However, there is no or little information available on

any well-designed, randomised and double-blinded clinical studies with this plant. Even though this plant is used in some commercially available Ayurvedic preparations, the need for extensive clinical studies to promote this plant or its components as a modern drug formulation cannot be overruled.

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