



Pithecellobium Jiringa: A Traditional Medicinal Herb

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Abstract

Pithecellobium jiringa (Jack) Prain is a traditional medicinal plant belonging to the family Leguminosae originated from the Southeast Asia. *P. jiringa* is locally known as “jering”, as well as “djengkol” in Indonesia. This plant is a kind of raw vegetable which is normally consumed with rice. *P. jiringa* is traditionally used to induce urination in which the seeds are crushed and mixed with water before drinking. Old folk has also been using its pounded leaves and bark for chest pains, skin ailments, gum pains and toothache. In the present day, *P. jiringa* is also being used in the production of organic pesticide as a replacement for synthetic pesticide; since the plant contains djenkolic acid that are able to kill and inhibit pests. In addition, the presence of the acid has also been suggested to cause tearing of renal tissue due to their formation of needle-like crystals. Methanolic extract of *P. jiringa* was found to inhibit the EBV activation by 30% which underlining *P. jiringa* in restraining cancer cells. *P. jiringa* was reported to cause djenkolism or poisoning of jering following intake of its beans and was shown to be a likely cause of acute anuric renal failure.

Background

Pithecellobium jiringa (Jack) Prain is a traditional medicinal plant belonging to the family Leguminosae originated from the Southeast Asia. In Malaysia, *P. jiringa* is locally known as “jering”, in Indonesia “djengkol”, in Cambodia “krakos” and in Thailand “niang-yai”. The plant usually stands up to 25 m in height with a smooth, grey coloured bark. Its beans which hang from the branches of the tree as coiled pods contains 3 to 9 beans per pod [1,2]. While the beans possess a large round shape with reddish brown in colour, the outer shell has an attractive purplish brown hue. The beans may measure up to 3.5cm in diameter and 2.0cm in thickness [3]. *P. jiringa*'s beans are typically taken together with rice as a side dish either as raw vegetable, roasted, fried or boiled [1,2]. There are also some people who like to consume the boiled beans of *P. jiringa* which are then mixed with some grind coconut.

Pharmacological properties of *P. jiringa*

P. jiringa is traditionally used to induce urination in which the seeds are crushed and mixed with water before drinking. Old folk has also been using its crushed leaves and bark for chest pains, skin ailments, gum pains and toothache. In treating wounds and cuts, the young leaves are being burned and its ashes are applied onto the injured area. Back in a few decades ago, the old folk used to colour their silk and other garments by using the colour of the pods. In the present day, *P. jiringa* is also being used as one of the raw material in the production of organic pesticide in order to replace the synthetic pesticide. *P. jiringa* is being added with a few more plants and urine. The selection of *P. jiringa* and the other plants in preparing the pesticide is due to the fact that each plants has the ability to kill and inhibit the growth of pests in a cultivation area. In this case, *P. jiringa* contains djenkolic acid which is a type of amino acid and sulphur that are able to kill and inhibit pests [4]. The acid has been suggested to form needle-like crystals in the urine after ingestion and have the ability to cut renal tissue which may lead to bleeding and obstruction in kidney [5].

P. jiringa was reported to possess high amount of dietary fibre and also non-cellulosic polysaccharides and this may contribute to greater consumption of the beans to the related particular group of people [6]. The beans of *P. jiringa* was screened for in vitro anti-tumor promoting activity using the inhibition test of Epstein-Barr virus (EBV) activation in Raji cells which was induced by 12-O-hexadecanoylphorbol-13-acetate. Significantly, methanolic extract of *P. jiringa* was found to inhibit the EBV activation by 30% or more at a concentration of 200mg/mL. This results highlighted the potential of *P. jiringa* in inhibiting and targeting cancer cells, as most cancer preventive agents used nowadays are derived from edible vegetables or fruits [7].

In addition to having high amount of dietary fibre and non-cellulosic polysaccharides, *Pithecellobium* spp. have been shown to own some significant biological activities; the presence of saponin in *P. racemosum* displayed toxicity towards ovaries cancer cell line of A2780 and M109 lung cancer cells. Besides having proteins, dietary fibre and unsaturated fatty acids,

legume seeds such *Pithecellobium* spp. have been stated to also contain the protease inhibitors such as the Bowman-Birk (MW 8-9 kDa) and Kunitz (MW 21 kDa). As such, the inhibitory activity of seeds of some *Pithecellobium* spp. reported are, for example the trypsin inhibitory activity in *P. keyense* was found to be higher than the same activity described for soybean [8]. Many previous studies on *P. jiringa* were done on investigating cases of djenkolism or poisoning of jering. Djenkolism is described by health practitioners as the patients suffer severe vomiting, diarrhea or constipation, intense colic, dysuria, macroscopic hematuria and oliguria that may progress to anuria. Since *P. jiringa* is a nitrogen-containing compounds, then djenkolism is also often been associated with the abnormally high level of the compounds that leads to azotemia. In addition, patients may also show symptoms of fever. While the urine is normally accompanied by a strong smell of sulphur, the breath is also of no exception [3].

A case study done on djenkolism following intake of *P. jiringa*'s beans by Wong et al., (2007) has highlighted djenkolism as a cause of acute anuric renal failure. The patients had shown characteristics of djenkolism within 48 hours of ingestion of the beans and presence of needle-like crystals in the urine leading to thick urine sludge formation. The method of treatment by hydration and alkalization of the urine in order to raise the solubility of the djenkolic acid was opted; whereby most patients recovered with no residual renal impairment and death is rare [9]. Kidney stones may also result from high concentrations of metabolites of *P. jiringa* [10].

Djenkolism often occurs in males as compared to females (9:1 ratio) and the acute renal failure that follows has appeared to be independent of the manner in which the *P. jiringa*'s beans are prepared; boiled, fried or even roasted beans [3]. Since *P. jiringa* is one of favoured traditional delicacy in this region; it is important to highlight to the general population regarding the probable health effects the beans may imposed on them and take suitable measures in their consumption.

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