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Role of *Peganum harmala* and its Chemical Constituents for Medicinal Usage †

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Abstract: The present review details the traditional use, phytochemistry, biological activity of its compounds, alkaloids, in particular, toxicity, medicinal uses of *Peganum harmala*, drawbacks associated with it, and the research areas which need to be focused got facilitating the development of effective therapeutic drugs from the phytochemicals of this species. Information regarding available studies on *Peganum harmala* was collected using journal websites using search engines such as Google Scholar, Baidu Scholar, Elsevier, ACS, PubMed, and Web of Science, along with local books, Ph.D. thesis, and MSc dissertation of students. *Peganum harmala* has been used as a traditional medicine in various parts of the world and is mentioned even in Indian ancient literature such as Rig Veda as "Soma Plant". It comprises varied metabolites, including alkaloids, flavonoids, essential oils, steroids, carbohydrates, and fatty acids. Several studies conducted on this plant have reported a wide range of pharmacological activities of *Peganum* alkaloids such as monoamine oxidase inhibitory activities, anticancer, antidiabetic, antimicrobial, antileishmanial, vasorelaxant, anti-platelet, antioxidant, and anti-inflammatory. However, toxicity has also been known to be associated with *Peganum* based on previous in vitro, animal model studies, and case reports which have shown its toxic effect. Numerous experimental pieces of evidence attribute to the thepharmacological efficacy of *Peganum harmala* and its alkaloids on cancer, diabetes, hypertension, Leishmaniasis, Mycobacterium tuberculosis, and other diseases. Most of the biological activities of *Peganum harmala* are accredited to the alkaloids present in it. However, data regarding the mode of action, pharmacokinetics, toxicology of this plant and its alkaloids are still limited. This lacuna identified emphasizes the need for more studies in this aspect before it can be incorporated into therapeutic use.

Keywords: *Peganum harmala*; harmine; harmalol; β-Carboline alkaloids; Quinazoline alkaloids

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Conflicts of Interest

The authors declare no conflict of interest.