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Emmenagogue and Abortificient Effect of *Peganum harmala*

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ABSTRACT

Peganum harmala, commonly called "Syrian rue," is native to countries around the Mediterranean sea and western United States. Known for its sedative effects when consumed by farm animals, its seeds have stimulant and hallucinogenic effects at low doses (3-4 g when eaten) in humans. *P. harmala* has been used traditionally as an effective emmenagogue and abortificient agent in the Middle East, India, and North Africa. It has also been shown that abortion happens frequently among animals that digest this plant in a dry year. Quinazoline alkaloids (e.g., vasicine and vasicinone) within *P. harmala* have been attributed to the abortificient effect of this plant. Throughout the northern and north western of india they *peganum harmala* usage is for aphrodisiac and emmenagogue and abortifacient.

INTRODUCTION

This compound is slightly soluble in water, alcohol and ether, quite soluble in hot alcohol and dilute acids. Over a wide range of doses there is a reduction in blood pressure due to a pronounced weakening of the heart muscle. Wild Syrian rue (*Peganum harmala* L. family Zygophyllaceae) is well-known in Iran and various parts of this plant including, its seeds, bark, and root have been used as folk medicine. Recent years of research has demonstrated different pharmacological and therapeutic effects of *P. harmala* and its active alkaloids, especially harmine and harmaline. Analytical studies on the chemical composition of the plant show that the most important constituents of this plant are beta-carboline alkaloids such as harmalol, harmaline, and harmine. Harmine is the most studied among these naturally occurring alkaloids. In addition to *P. harmala* (Syrian rue), these beta-carbolines are present in many other plants such as *Banisteria caapi* and are used for the treatment of different diseases. Syrian rue can grow up to 1m, but in the wild rarely gets above 0.3m in height. It has narrow leaves that are usually 5 cm long when fully grown and produces many single white flowers.

Harmal (*Peganum harmala* L. family Zygophyllaceae) is a perennial, glabrous plant which grows spontaneously in semi-arid conditions , steppe areas and sandy soils, native to eastern Mediterranean region , It is a shrub, 0.3-0.8 m tall with short creeping roots, white flowers and round seed capsules carrying more than 50 seeds. The plant is well-known in Iran and is widely distributed and used as a medicinal plant in Central Asia, North Africa and Middle East. It has also been introduced in America and Australia. Dried capsules – mixed with other ingredients – are burnt as a charm against “the evil eye” among Iranians. This plant is known as “Espand” in Iran, “Harmel” in North Africa and “African rue,” “Mexican rue” or “Turkish rue” in the United States.Various parts of *P. harmala* including its seeds, fruits, root, and bark, have been used as folk medicine for a long time in Iran and other countries.

Taking 3-4 grams of Syrian rue seeds can cause hallucinations and stimulant effects.Syrian rue is LIKELY UNSAFE when taken by mouth in high doses. Serious side effects affecting the nervous system, heart, liver, and kidneys, as well as death, have been reported in people who consumed high amounts of Syrian rue seeds.

Since ancient times, *P. harmala* has been used by traditional healers to make various preparations in the treatment of cancers and tumors in some parts of the world .For example, it has been so common in traditional medicine of Morocco to use powdered seeds of *P.*

harmala to treat skin and subcutaneous tumors. The seed extract of *P. harmala* is the main component of a very common ethnobotanical preparation used against different cancers and neoplasms in Iran, namely Spinal-Z.

The seeds of Syrian rue are of most interest, as they contain the harmala alkaloids harmine and harmaline – highly psychoactive alkaloids that are sometimes used to potentiate other plants, although it is reported that harmala alkaloids are psychoactive by themselves. They also act as reversible MAO inhibitors (RIMAs).

In the past the *peganum harmala* have been used in the Middle East as uplifting. The Greek physician Dioscoride (1-2 AD) and Galen (1-2) and their counterpart Abu Ali Sina (6-7) have been prescribed as parasitic repellents and accelerate the flow of menstrual flow. As Iranian old scientist Mohammad Hasan Aghili Khorasani Shirazi wrote in his book that, the maximum consumption for *peganum harmala* is a quarter of a teaspoon and shoud be swallowed with water. For 40 days, or maximum 80 days to cause abortion, consumption more than this will cause poisoning because it contains poison.

As per as a research on Pharmacological Effects of *Peganum harmala* Seeds Extract on isolated Rat Uterus ,the study shows that The effects of hydroalcoholic extract of *Peganum harmala* seeds (EPS) on spontaneous rhythmic contractions of isolated rat uterine was investigated in this study. EPS was tested on the isolated uterus and endometrium free (i.e. stripped myometrium) preparations. EPS was found to exhibit significant spontaneous contractions of the uterus and stripped myometrium relative to the solvent control.

After recording the pattern of uterus tissue spontaneous motility, in order to determine mechanism of EPS pharmacological effects, atropine, indomethacin, or prazocin was added into the organ baths. Pretreatment with atropine (70 nM) in both the whole uterus and in the stripped myometrium preparations had no effects on the response to cumulative dosage of EPS. Calcium-free solution decreased the uterus contractions. In calcium dose-response curves, EPS in some concentrations produced uterotonic effect in calcium-free solution in the presence of KCl. This finding showed that EPS may increase calcium influx through voltage-dependant calcium channels.

These findings indicate that the high concentration of KCl depolarized the membrane and increased calcium influx through voltage-dependant calcium channels and EPS in some concentrations facilitated this action. The extracellular (external) calcium is necessary for the uterotonic effect of EPS. In conclusion, the results of this study suggests that EPS-induced contractions of uterus are not dependent on prostaglandins, muscarinic and alpha receptors. These contractions are related to external calcium.

CONCLUSION

My purpose in preparing this paper was to show the traditional usage and previously confirmed pharmacological effects of *P. harmala* as one of the most well-known medicinal plants in Iran and to illustrate it's potential to be used as a novel source for the development of new drugs based on the most recent associated studies. As it is evident from this study, *P. harmala* has a wide range of pharmacological effects including cardiovascular, nervous system, gastrointestinal, antimicrobial, antidiabetic, osteogenic, immunomodulatory, emmenagogue, and antitumor activity among many other effects. Beta-carboline alkaloids contained in *P. harmala* are the most important contents of the plant responsible for most of its pharmacological effects. Since there have been many reports of intoxications following ingestion of specific amounts of *P. harmala* seeds, care should be taken by scientists and clinicians regarding usage of this plant for therapeutic purposes until adequate studies confirm the safety and quality of the plant. Finally, based on this information, this review provides the evidence for other researchers to introduce *P. harmala* as a safe and effective therapeutic source in the future.

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