



Adiantum Capillus Veneris L.: From Iranian Traditional Medicine to Modern Phytotherapy

Nastaran Ebadi¹, Fatemeh Farjadmand¹, Mozghan Mehri¹, Fahimeh Mohajerani¹,
Azadeh Raies-Dana¹, Zahra Shahpiri¹, Roja Rahimi¹

¹ Department of Traditional Pharmacy, School of Traditional Medicine, Tehran University of Medical Sciences, Tehran, Iran

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Abstract

Adiantum Capillus veneris L. from the family Polypodiaceae, is one of the medicinal herbs used in Iranian traditional medicine (ITM). It has been identified as “Parsiavashan” in Iranian traditional medicine and commonly known as “Maidenhair fern” in English. Triterpenoids and flavonoids are the major compounds identified in Maidenhair fern. It has been used in Iranian traditional medicine for treating respiratory tract diseases, irregular menstruation, flatulence, jaundice, splenomegaly and scrofula. It has been topically used in skin and hair disorders, too. The pharmacological activities reported from this plant are anti-inflammatory, antinociceptive, antimicrobial, antidiabetic, diuretic and antioxidant. However, there is not direct relationship between pharmacological activities of this plant in Iranian traditional medicine and modern phytotherapy; the anti-inflammatory and antimicrobial properties of this plant could make it useful for respiratory tract disorders. Anyway, it is recommended to design experimental and clinical studies on pharmacological activities and indications of *Adiantum capillus veneris* mentioned in Iranian traditional medicine literatures.

Keywords: *Adiantum Capillus veneris*; Iranian traditional medicine; Parsiavashan; Maidenhair fern; Phytotherapy

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1. INTRODUCTION

Adiantum Capillus veneris L. is a medicinal plant from the family Polypodiaceae with a subcosmopolitan worldwide distribution. It is commonly known as “Maidenhair fern” in English, “Shar-al-jabar” and “Kozbore-al-ber” in Arabic and “Parsiavashan” in Persian [1].

It is known as a useful herb with various

medicinal indications in Iranian traditional medicine (ITM). In this study, we reviewed different medicinal aspects attributed to this plant in ITM and compared it with those mentioned in modern phytotherapy.

2. METHODS

Reliable ITM literatures [2], [3], [4], [5], [6], [7], [8], [9], [10], electronic databases

Corresponding Author: Roja Rahimi
Email: rahimi_r@tums.ac.ir

including PubMed and Google Scholar and phytotherapy reference books were searched to find valuable subjects about this plant.

3. RESULTS

3.1. Botanical description

Parsiavashan has been described in ITM as an herb with black firm liny scions in red. Its leaf looks like Coriander and the size of its scions is about one span. It has no stem, flower and fruit [2], [4], [6], [7], [9], [11]. It has almost no specific flavor. It has just a very subtle pungent taste that cannot be felt [7].

In modern phytotherapy, it is identified as perennial, rhizome creeping, clothed with narrow black scales, with leaves broadly oblong, bi- or tripinnatifid, thin, stipes blackish-brown, shining, ultimate segments borne on capillary stalks, cuneiform ovate, asymmetric, entire on the sides, palmately dissected at apex, fertile lobes terminating in transverse linear-oblong sori, sterile lobes crenate or crenate-dentate, rock fissures, near oozing water, near waterfalls, on the banks of mountain streams, in caves, and spreading most readily over calcareous formations, often on tuffs [12].

3.2. Distribution

It grows in north, east, west and western south of Iran, also in Europe, Asia, and North America [1].

3.3. Medicinal parts

Aerial parts in ITM [2] and whole plants (aerial parts plus rhizomes) in modern phytotherapy are used for medicinal purposes [13].

3.4. Temperament

The nature of this herb is temperate willing to hotness and dryness [2], [7], [9], [14].

3.5. Chemical constituents

Chromatographic fractionation of the alcoholic extract of the dried fronds of *Adiantum capillus veneris* (Adiantaceae) yielded seven compounds: four triterpenoidal compounds belonging to adiantane and filicane groups and identified as isoadiantone, isoadiantol-B, 3-methoxy-4-hydroxyfilicane, 3,4-dihydroxyfilicane, and three flavonoids

identified as quercetin, quercetin-3-O-glucoside and quercetin-3-O-rutinoside (rutin) [15]. The ethanolic extract of its fronds contains two new triterpenoids characterized as 30-normethyl fernen-22-one (capillirone, 1) and hopan-3 β -ol (capillirol B, 2) [16].

Nineteen triterpenoids have been isolated from the crude hexane extract of plant [17]. The plant also contains sterols including beta-sitosterol, stigmasterol and campesterol [18].

3.6. Pharmacologic activities and indications

The most important indication of *Adiantum capillus veneris* in ITM is for respiratory tract diseases such as productive cough, dyspnea, allergic asthma, and tuberculosis [2], [3], [6], [7]. It has been also used for regulating menstruation and treating flatulence, jaundice, splenomegaly and scrofula [2], [3], [6], [7], [19].

It has been topically used in ITM for skin and hair disorders such as shanker, chronic ulcer, impetigo, hair fall, alopecia and ichthyosis [2], [6], [7], [15].

Current pharmacological investigations showed anti-inflammatory and anti-nociceptive properties of the plant and the possible role of 30-normethyl fernen-22-one (capillirone, 1) and 4- α -hydroxyfilicane-3-one in these activities [15]. *Adiantum Capillus veneris* detoxified the arsenic stress through induction of anti-oxidant defense system [20].

The extract of the *Adiantum Capillus veneris* as well as pure compounds isolated from it, has been demonstrated to possess multiple pharmacological activities including antiviral, insect-molting hormone, and antimicrobial activities [19], [21], [22].

In addition, total flavonoids from *Adiantum Capillus veneris* L showed high scavenging activity on hydroxyl radicals [23].

El-Tantawy et al. demonstrated the antidiabetic and diuretic effects of the alcohol and aqueous extracts of *Adiantum Capillus veneris* as well as the isolated mucilage [11].

3.7. Adverse events

According to ITM, *Adiantum capillus veneris* is harmful for spleen and this adverse event could be reduced by mastic (oleogum resin of *Pistacia lentiscus*) and also sweet violet (flower of *Viola*

odorata) [2], [3], [6]. No adverse events reported for this plant in modern phytotherapy.

4. DISCUSSION

Chemical studies on *Adiantum Capillus veneris* have revealed that terpenoids and flavonoids are the major chemical constituents. The major indications of this plant in ITM are for respiratory tract and hepatic diseases, regulating menstruation, and skin and hair disorders. The biological activities reported from this plant are anti-inflammatory, antinociceptive, antimicrobial, antidiabetic, diuretic and antioxidant.

However, there is not direct relationship between pharmacological activities of this plant in ITM and modern phytotherapy; the anti-inflammatory and antimicrobial properties of this plant could make it useful for respiratory tract diseases. Anyway, it is recommended to design experimental and clinical studies on pharmacological activities and indications of *Adiantum capillus veneris* mentioned in ITM literatures.

5. CONFLICT OF INTERESTS

Authors have no conflict of interests.

6. ACKNOWLEDGMENTS

None

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