

## Protective Effect of *Pistacia Atlantica* Against Renal Disorders

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<b>Letter to Editor</b>	<b>Received:</b> 03.06.2022	<b>Accepted:</b> 16.06.2022	<b>Doi:</b> 10.22123/PHJ.2024.381200.1144
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### Abstract

Kidney disorders are common in patients referred to clinics. Nowadays, finding treatment solutions for patients with kidney disorders is one of the concerns of clinicians. On the other hand, natural products can be used as therapeutic agents to attenuate renal diseases. As a natural plant, *Pistacia Atlantica* has many components with antioxidant effects. It seems that it may be helpful in the treatment of renal disorders. However, other research is needed to show its beneficial effects against various renal damages.

### Keywords:

*Pistacia Atlantica*, Protective effect, Renal disorders, Oxidative stress

The kidneys eliminate the waste products and regulate the water and electrolyte balance. They play a key role in the metabolism and excretion of drugs and harmful substances, as well as in maintaining body homeostasis. Therefore, kidney damage can be very harmful. It occurs for various reasons, such as chemotherapy, shock, infection, surgery, and the use of antibiotics [1-3]. If kidney damage has occurred recently, i.e. within a few hours, days, or weeks, and the kidney recovers with treatment, this condition is called acute kidney injury. However, in chronic kidney injury, the kidneys gradually fail over several months or years. In this case, the kidney tissue cannot be repaired and the disease is usually irreversible [1-3].

Today, finding therapeutic strategies in patients with renal disorders is one of the concerns of clinical urologists [4]. In this regard, it has been shown that natural resources can be useful as therapeutic agents for the prevention and attenuation of renal disorders [5, 6].

*Pistacia Atlantica*, as a natural plant (from the *Anacardiaceae* family), is one of the wild pistachio species with a strong antioxidant effect due to its phenolic compounds (phenolic acids, flavonoids, and tannins) [7]. It grows on the Mediterranean coast, Turkey, Iran, Central and Western Asian countries, and Africa. In Iran, it grows in a considerable amount in the regions of Kurdistan and Fars. It should be noted that today due to the value of *Pistacia Atlantica*, its protection has become a priority [7].

There is a large amount of unsaturated fatty acids in this pistachio. Its unsaturated fatty acids include oleic acid, linoleic acid, palmitic acid, stearic acid, and palmitoleic acid [8]. In this regard, Toul et al. have reported that *Pistacia Atlantica* has many tocopherol compounds and high beta-carotene, causing a

high antioxidant effect [9]. In addition, Rigane et al. show that several compounds, including steroids, terpenoids, anthocyanins, tannins, phytosterols, coumarins, proteins, amino acids, flavonoids, and carbohydrates, exist in *Pistacia Atlantica* [10].

On the other hand, Mahjoub et al. have reported that the main compounds of *Pistacia Atlantica* pharmacologically include  $\alpha$ -pinene, terpineol, myrcene, and sabinene [11]. Moreover, it has been shown that *Pistacia Atlantica* has a nephroprotective effect against gentamicin-induced renal injury. It seems that the renoprotective impacts of *Pistacia Atlantica* are related to its anti-inflammatory and antioxidant (by increasing the activity of superoxide dismutase and catalase) activities [12]. Incidentally, it has been shown that *Pistacia Atlantica* extract may attenuate the oxidative/antioxidant balance in the kidney tissues by decreasing lipid peroxidation in the cadmium-induced renal injury model [13]. Also, the presence of natural phenolic and flavonoid compounds in *Pistacia Atlantica* may provide effective protection against oxidative stress in the body [14, 15].

In conclusion, *Pistacia Atlantica* has potent antioxidant effects due to its compounds, such as gallic acid, quercetin, and luteolin. Thus, it can reduce oxidative stress in kidney tissue. Also, *Pistacia Atlantica* seems useful for removing renal stones and washing the urinary tract due to its diuretic properties. However, different experimental and clinical studies are needed to prove the beneficial effects of its compounds against various renal disorders.

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