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# A Review of Medicinal Plants in the Management of Cardiac Arrhythmia: Natural Agents for Heart Health and Their Mechanisms of Action

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**A B S T R A C T**

**Objective**: Cardiac arrhythmia is a medical diagnosis based on an irregular heart rhythm. In patients with cardiac arrhythmia, there is a disruption in the electrical conduction between the sinoatrial node and the atrioventricular node. Arrhythmia, or irregular heartbeat, refers to issues with the heart's speed or rhythm. The heartbeat can be too fast, too slow, or irregular. The use of medicinal plants as a natural and complementary approach to managing and preventing cardiac arrhythmias has attracted the attention of many researchers and health professionals. The purpose of this study is to identify medicinal plants used in the management and treatment of cardiac arrhythmias and to explore their potential mechanisms of action.

**Methods**: In this review study, articles were searched using key terms such as "medicinal plants," "Iran," "arrhythmia," and "traditional medicine." Databases such as Google Scholar, SID, Magiran, PubMed, Scopus, as well as traditional medicine texts, were used for the search.

**Results**: Medicinal plants such as yarrow (*Achillea millefolium*), pear (*Pyrus communis*), grape (*Vitis vinifera*), spinach (*Spinacia oleracea*), beet (*Beta vulgaris*), almond (*Prunus dulcis*), sesame (*Sesamum indicum*), pumpkin (*Cucurbita pepo*), valerian (*Valeriana officinalis*), cinnamon (*Cinnamomum*), hawthorn (*Crataegus*), sidr (*Ziziphus spina-christi*), lavender (*Lavandula*), garlic (*Allium sativum*), and lemon balm (*Melissa officinalis*) are among the most important medicinal plants traditionally used in Iran to manage cardiac arrhythmias.

**Conclusion**: Studies suggest that the medicinal plants used in traditional Iranian medicine, due to their antioxidant, anti-inflammatory, and cardioprotective properties, can serve as a complementary approach in managing cardiac arrhythmias. Using these plants, particularly in the early stages of arrhythmia and under medical supervision, may help regulate heart rhythm and promote heart health. Further clinical research is necessary to confirm and better understand the mechanisms of action of these plants.

**Keywords**: Heart, Cardiovascular disease, Arrhythmia, Medicinal plants, Treatment

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## Introduction

Cardiac disease, has high incidence of death in all countries [1]. Cardiac arrhythmia refers to disturbances in the natural rhythm of the heart, where the heartbeat may become faster, slower, or irregular [2]. These disturbances are caused by issues in the heart's electrical conduction system, including the sinoatrial node and the atrioventricular node, which lead to abnormal changes in the heart rate and rhythm [3]. Cardiac arrhythmias can lead to severe health complications, and in extreme cases, they may result in heart failure or cardiac arrest. Therefore, the treatment and management of arrhythmias are of paramount importance [4].

An increase in heart rate during physical activity and a decrease in heart rate during rest or sleep is a natural response [4]. Additionally, experiencing occasional palpitations is generally not abnormal and is often of no concern. However, frequent irregular rhythms may indicate an issue with the heart's ability to pump blood sufficiently throughout the body. This condition may lead to symptoms such as dizziness, fainting, or other physiological problems



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[5]. Various types of cardiac arrhythmias can be managed and treated using medications or specialized procedures to regulate the irregular heart rhythm. Failure to treat these disorders can lead to damage to the heart, brain, or other vital organs and, in some cases, may result in more serious outcomes such as death [6].

Cardiac arrhythmia is a disorder of the natural heart rhythm that can cause a range of symptoms including irregular heartbeats, anxiety, chest pain, and difficulty breathing [6]. In some cases, the disorder is detected without any obvious symptoms. To diagnose arrhythmia, the physician relies on the medical history, physical examination, and tests such as electrocardiography (ECG) and blood tests [7]. Holter monitoring and cardiac imaging are also employed for a more accurate evaluation [8].

Arrhythmia triggers are specific factors that can cause or worsen arrhythmias in individuals who are at high risk [8]. These triggers typically include conditions that put pressure on the heart's activity, such as changes in blood sugar levels, caffeine or drug consumption, dehydration, and electrolyte disturbances like potassium or magnesium deficiency. Additionally, emotional stress, intense physical activity, and conditions such as vomiting or coughing can exacerbate arrhythmias. To prevent these triggers, consultation with a physician is crucial [9].

Several measures are available for preventing cardiac arrhythmia, especially for those at high risk of developing the condition [10]. The first step is avoiding arrhythmia triggers and treating underlying diseases that may lead to this problem [11]. Furthermore, lifestyle modifications such as choosing heart-healthy foods, engaging in regular physical activity, achieving a healthy weight, quitting smoking, and managing stress can help maintain heart health. Additionally, if a child has underlying conditions, regular consultation with a doctor and periodic examinations to identify arrhythmic symptoms are essential [12].

In modern medicine, there are numerous treatments available for controlling cardiac arrhythmias, ranging from chemical medications to invasive methods such as surgery and defibrillators [13]. However, in many cases, these treatments may come with side effects, which is why the use of natural therapies as complementary options has gained attention [14]. Medicinal plants, especially in traditional Iranian medicine, are recognized as rich sources of bioactive compounds that can have beneficial effects on heart health and particularly in regulating heart rhythms [14].

Traditional Iranian medicine has a long history of using medicinal plants to treat various cardiac disorders [15]. Among these plants, Yarrow, Pear, Spinach, and Valerian are notable for their specific effectiveness in reducing arrhythmia symptoms and improving heart function [16, 17].

Given that the use of medicinal plants in treating cardiac arrhythmias has been demonstrated in numerous early studies, the primary aim of this article is to review the medicinal plants effective in this domain and their mechanisms of action.

## Methodology

In this review study, a comprehensive search of scientific sources and reputable databases was conducted to assess the effects of medicinal plants on cardiac arrhythmias. Initially, key terms such as "medicinal plants," "Iran," "cardiac arrhythmia," and "traditional medicine" were used in various combinations to identify the most relevant studies. The search was carried out in respected scientific databases including Google Scholar, PubMed, Scopus, and local Iranian databases such as SID and MegaIran. Additionally, books and reliable sources in the field of traditional Iranian medicine were used as supplementary references for obtaining more detailed information.

The studies included in this review comprised original articles, systematic reviews, and review articles that focused on the impact of medicinal plants on cardiac arrhythmias. To identify suitable studies, the titles and abstracts of articles were initially reviewed. Full-text articles that were related to the study's objectives were then downloaded for a more thorough examination.

Inclusion criteria for the study included: studies investigating the effects of medicinal plants on arrhythmias, studies conducted in Iran or related to medicinal plants used in traditional Iranian medicine, and articles published in the last decade. On the other hand, articles that focused solely on the effects of chemical medications without mentioning medicinal plants were excluded.

Finally, data extracted from the articles, including the type of plant, its active components, mechanisms of action, and clinical outcomes related to cardiac arrhythmias, were categorized and analyzed.



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## Results

In traditional Iranian medicine, several medicinal plants are used for the management of cardiac arrhythmias. Some of the most important of these plants include Yarrow, Pear, Grape, Spinach, Beetroot, Almond, Sesame, Pumpkin, Valerian, Cinnamon, Hawthorn, Sidr, Lavender, Garlic, and Lemon balm. These plants are recognized for their therapeutic properties in controlling and improving heart-related issues. Table 1 provides further details about the medicinal plants effective in combating cardiac arrhythmias.

**Table 1:** Medicinal Plants Effective in Treating Arrhythmia in Traditional Iranian

| Persaian name | English name | Scientific name | Herbal family | Mechanism | Ref. |
|---|---|---|---|---|---|
| Boumadaran | Yarrow | Achillea millefolium | Asteraceae | Anti-inflammatory and calming effects, improved blood flow | [18] |
| Golabi | Pear | Pyrus spp. | Rosaceae | Antioxidant and heart health support | [19] |
| Angour | Grape | Vitis vinifera | Vitaceae | Contains antioxidants, improves heart function | [20] |
| Esfenaj | Spinach | Spinacia oleracea | Amaranthaceae | Contains nutrients, helps reduce blood pressure | [21] |
| Ghoghondar | Beetroot | Beta vulgaris | Amaranthaceae | Improves blood flow and anti-inflammatory effects | [22] |
| Badam | Almond | Prunus dulcis | Rosaceae | Contains healthy fats, supports heart health | [23] |
| Konjed | Sesame | Sesamum indicum | Pedaliaceae | Contains beneficial fatty acids, improves heart function | [24] |
| Kadou | Pumpkin | Cucurbita pepo | Cucurbitaceae | Contains nutrients and antioxidants | [25] |
| Sonboloteib | Valerian | Valeriana officinalis | Valerianaceae | Calming effects and improves sleep quality | [26] |
| Darchin | Cinnamon | Cinnamomum verum | Lauraceae | Improves insulin sensitivity and anti-inflammatory effects | [27] |
| Zalzalak | Hawthorn | Crataegus spp. | Rosaceae | Supports cardiovascular health | [28] |



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|---|---|---|---|---|---|
| Konar | Sidr | Ziziphus spina-christi | Rhamnaceae | Anti-inflammatory properties and improves circulation | [29] |
| Ostokhodous | Lavender | Lavandula angustifolia | Lamiaceae | Calming effects and reduces anxiety | [30] |
| Sir | Garlic | Allium sativum | Amaryllidaceae | Lowers blood pressure and antioxidant properties | [31] |
| Badranjbouyeh | Lemon balm | Melissa officinalis | Lamiaceae | Calming effects and improves sleep quality | [32] |

## Discussion

Cardiac arrhythmias are disruptions in the normal rhythm of the heart, which can directly threaten cardiovascular health [16]. In recent years, the use of medicinal plants to manage these disturbances has garnered considerable attention. Medicinal plants, due to their anti-inflammatory, antioxidant, and heart-regulating properties, can serve as a complementary method for the prevention and treatment of cardiac arrhythmias [17]. Many medicinal plants, especially those considered in traditional medicine for heart-related issues, contain natural active compounds that help improve blood circulation, reduce inflammation, lower blood pressure, and enhance heart health [18].

*Achillea millefolium* (Yarrow), belonging to the Asteraceae family, has anti-inflammatory and calming effects, which contribute to improved blood circulation [19]. This plant can play a significant role in reducing the symptoms of cardiac arrhythmias and enhancing heart function [19]. *Pyrus spp.* (Pear) from the Rosaceae family is known for its strong antioxidant properties, which can support heart health and improve vascular function [19]. *Vitis vinifera* (Grape), from the Vitaceae family, contains nutrients that contribute to better heart function and have beneficial effects in preventing arrhythmias [20].

Other plants such as *Spinacia oleracea* (Spinach) and *Beta vulgaris* (Beetroot), from the Amaranthaceae family, are rich in nutrients and antioxidants that assist in improving heart function and lowering blood pressure [21,22]. *Cinnamomum verum* (Cinnamon), from the Lauraceae family, can help regulate heart function and prevent arrhythmias by improving insulin sensitivity and exerting anti-inflammatory effects [27]. Additionally, plants like *Lavandula angustifolia* (Lavender) and *Melissa officinalis* (Lemon Balm), from the Lamiaceae family, are known for their calming effects, which can reduce stress and anxiety, thereby improving sleep quality—factors that indirectly impact arrhythmias [30,32].

## Conclusion

In conclusion, the use of medicinal plants can be considered a natural and complementary therapeutic strategy for managing cardiac arrhythmias. These plants not only help improve heart function and alleviate arrhythmia symptoms but also play a crucial role in preventing more serious complications of these disturbances, such as heart or brain strokes. However, for effective and safe use of these plants, consultation with a physician and clinical monitoring are essential to achieve the best outcomes.

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The authors have no competing interests to declare that are relevant to the content of this article.



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## Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki.

## Consent to participate

Informed consent was obtained from all individual participants included in the study.

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