

# Botanicals for Regulating Heart Rhythms

**Eric Yarnell, N.D., R.H., and  
Kathy Abascal, B.S., J.D., Herbalist**

Clinicians encounter patients with cardiac arrhythmias commonly. Many of these are minor and represent no danger to patients but some of these problems may cause sufficient palpitations and distress or hemodynamic effects to warrant treatment. As always, the cause or causes of any arrhythmia should be investigated and treated directly if possible. Sometimes the cause is not immediately or ever apparent, however, and therapy to control symptoms may be necessary. Because antiarrhythmic drugs all have adverse effects—some of them quite serious, including worsening of arrhythmias by flecainide and encainide—safer botanical options are called for. This article reviews herbs that can modulate heart rhythms beneficially and discusses the clinical uses of these herbs. Obviously, other natural therapies and lifestyle changes may be important for relieving arrhythmias but they are beyond the scope of this article.

Clearly, arrhythmias are a complex area. Only practitioners who are trained in this area should attempt to treat arrhythmias, unless a thorough workup by a cardiologist has failed to reveal any known cause of the arrhythmia. In such instances, the arrhythmia is considered to be nonpathologic. Generally, these are instances of mild sinus tachycardia or intermittent premature ventricular contractions. Most competent clinicians with basic cardiovascular knowledge can treat patients with nonpathologic arrhythmias safely. In all other instances, only the most experienced and knowledgeable clinicians should attempt therapy. Laypeople should be told not attempt to treat their own arrhythmias but instead should be strongly encouraged to seek diagnostic and therapeutic support.

The more serious an arrhythmia is, the more careful one has to be in deciding on botanical treatment. Atrial flutter and atrial fibrillation are associated with an increased risk of thromboembolism. They should only be treated with botanical medicine by highly experienced clinicians. Those with little experience should refer patients with these conditions to cardiologists. Any recurrent or chronic arrhythmia, especially when it is associated with other symptoms, such as shortness of

breath or lightheadedness, is indicative of underlying pathology that needs to be thoroughly investigated by a licensed health care practitioner.

## Simple Sedatives for Treating Minor Arrhythmias

Arrhythmias that are not related to underlying heart or systemic pathology but that are sufficiently strong to cause palpitations and/or anxiety can be quite debilitating. In these circumstances, the costs and hazards of drug therapy or pacemaker implantation make them treatments of last resort. Numerous botanicals are available for precisely these circumstances to reduce or eliminate the problem safely and more cost effectively.

*Leonurus cardiaca* (motherwort), a humble mint of Eurasian origin, stands preeminently among botanical remedies for non-pathologic arrhythmias. The prickly flowering tops of the herb are used, preferably fresh. Its active and supportive constituents have not been well-characterized although it has long been used as a tea effectively, suggesting that the most important compounds are watersoluble.

The late, preeminent figure of German phytotherapy, Rudolf Fritz Weiss, M.D., hailed motherwort as a remedy for, “functional heart complaints due to autonomic imbalance.”<sup>1</sup> Eclectic practitioners have written about the sedative nature of this herb, including Harvey Wickes Felter M.D.<sup>2</sup> It is possible that motherwort acts, in part, simply, by calming the patient and reducing anxiety induced by fear of heart disease or the strangeness of the sensation of palpitations. People who are under heavy stress and not compensating for it well may also benefit when treated with motherwort. Motherwort is considered by many clinicians to be specific for palpitations secondary to hyperthyroidism. Palpitations that interfere with sleep or concomitant smooth-muscle spasms in the gut or reproductive tract may also be counteracted by motherwort.

A typical adult dose of motherwort is 1–2 teaspoons per cup of water, infused for 15–20 minutes, which is drunk in three cups per day. A glycerin extract (75 percent glycerin) has also proved to be useful at a dose of 3–5 mL, three times per day, or in lower quantities when combined with other herbs in formulations. The herb is completely safe with no known contraindications.

*Valeriana officinalis* (valerian) root, *Valeriana sitchensis* (Pacific valerian) root, *Scutellaria lateriflora* (skullcap) herb, *Passiflora incarnata* (passionflower) leaf, *Zizyphus jujuba* (jujube), and *Piper methysticum* (kava) root are some of the other choices for problems such as this. These herbs are less specific than motherwort although they can all help to normalize heart rhythm, caused by

NOTE: All Latin and common names used are taken from McGuffin M, Kartesz JT, Leung AY, Tucker AO. American Herbal Product Association's Herbs of Commerce, 2nd ed. Silver Spring, MD: American Herbal Products Association, 2000.

or secondary to anxiety, uncompensated stress, or by unknown but nonpathologic causes. All of these herbs have long histories of safe use and have not produced adverse effects in clinical trials.

The recent concern about the hepatotoxicity of kava is based on no more than a handful of cases, most of which do not even support the connection as a result of interfering factors, such as concomitant use of hepatotoxic drugs.<sup>3</sup> No reasonable practitioner would ignore the beneficial effects of an herb (let alone ban it) based on such paltry, weak evidence. In our opinion, political reasons must be driving the current hysteria surrounding the use of kava.

One of the safest among these herbs, although it has been poorly researched, is skullcap. A member of the Lamiaceae family like motherwort, there are species in the genus that are native to both Eurasia and North America. Based on clinical experience, skullcap is a very broadly applicable nervine that is helpful for treating patients who have anxiety, insomnia, seizure disorders, attention deficient hyperactivity disorder, and similar problems. In addition, many practitioners have found the herb useful for treating patients who have minor arrhythmias. This herb is an excellent candidate for clinical trials, given its widespread use—and general appreciation—by practitioners. It is imperative that skullcap be used fresh or prepared from the fresh plant because the dried plant material loses much of its activity. A typical dose of glycerite (75 percent glycerin) or tincture (30 percent ethanol) is 3–5 mL, three times per day, for adults.

## Queen-of-the-Night

Several botanicals are considered specifically for treatment of patients with arrhythmias in general. One of the most promising yet often forgotten herbs is *Selenicereus grandiflorus* (formerly *Cactus grandiflorus*), known colloquially as night-blooming cereus. This climbing member of the Cactaceae family is unusual in that it is native to the rainforests of Central America, México, and the Caribbean instead of the desert. This cactus produces an enormous, incredibly fragrant white flower in a very narrow “window” of time late at night once each year, earning it another common name: queen-of-the-night.

The Eclectic physicians (medical doctors who used primarily natural remedies most active from 1850 to 1930) appear to have used night-blooming cereus extensively. It was considered to be a nervine with exceptional specificity for regulating the conductive activity of the heart.<sup>2</sup> Although the herb was mainly considered to be helpful for treating tachyarrhythmias, some practitioners also felt that it could counteract bradycardiac problems. This herb was also recommended for counteracting problems associated with valvular regurgitation, particularly aortic regurgitation and mitral valve prolapse. However, Felter wrote that it was contraindicated in cases of stenotic valves. Night-blooming cereus is useful for treating palpitations related to menopause and anxiety. The herb can also be beneficial for patients with mild congestive heart failure, although the plant does not contain cardioactive glycosides.<sup>4</sup> The nature of its action

**Table 1. Summary of Major Antiarrhythmic Herbs**

Latin name	Common name	Part used	Typical adult dose	Warnings
<i>Leonurus cardiaca</i>	Motherwort	Leaf and flower	Infusion: 1–2 tsp/cup of water infused for 15–20 minutes, 1 cup, tid Fresh plant glycerin extract: 3–5 mL, tid	Occasional mild sedation
<i>Scutellaria lateriflora</i>	Skullcap	Leaf and flower	Fresh plant glycerite or tincture: 3–5 mL, tid	Occasional mild sedation
<i>Cytisus scoparius</i>	Scotch broom	Leaf and flower	Fresh or dry plant tincture: 0.5–1 mL, tid	Avoid in pregnancy, atrioventricular block, hypertension; many drug interactions; may cause bradycardia
<i>Selenicereus grandiflorus</i> or <i>Hylocereus undatus</i>	Night-blooming	Stem and flower cereus or queen-of-the-night	Fresh plant tincture: 5–15 gtt, tid	Do not overdose
<i>Rauwolfia serpentina</i>	Rauwolfia	Root	Dry plant tincture: standardized to 0.1–0.125% reserpine, 3–5 gtt, tid	Minor nasal stuffiness and loose stools common; avoid in depressed patients; do not overdose; many drug interactions
<i>Convallaria majalis</i>	Lily-of-the-valley	Root	Fresh plant tincture: 0.5–1 mL, tid	May cause nausea; hypokalemia potentiates toxicity
<i>Crataegus laevigata</i>	Hawthorn	Leaf, flower, and haws	Infusion: 2–3 tsp/cup, steeped for 10–15 min, 1 cup, tid Fresh or dry plant tincture or glycerite: 3–10 mL, tid Extracts standardized to 1.8% vitexin-4'-rhamnoside or 10% procyanidins: 100–250 mg, tid	None

is gentle—it takes fairly consistent use over several months to obtain the full benefit. Absolutely no research on this plant could be located.

Use of a fresh plant tincture (50 percent ethanol) is recommended. The usual dose ranges from the low end in the Eclectic tradition of 10–30 drops diluted in 4 ounces of water, then the patient should take 1 teaspoon, three times per day, up to a more pharmacologic dose of 5–15 gtt, three times per day. Although queen-of-the-night is generally considered to be an herb to use with caution, Felter did not mention any serious adverse effects. It should probably be avoided in pregnancy and lactation because of lack of information.

A similar vine-like jungle cactus is known as *Hylocereus undatus*. These two cacti are sufficiently morphologically similar that some professionals in the field consider them to be frequent adulterants of one another. Dr. Yarnell's mentor, Silena Heron N.D., of Sedona, Arizona (founding chair of botanical medicine at Bastyr University in Kenmore, Washington), sent tinctures made from *Selenicereus grandiflorus* and *Hylocereus undatus* to the late John Bastyr, N.D., D.C., without saying which was which. He eventually reported back that the bottle that contained *Hylocereus* tincture was generally more clinically effective.

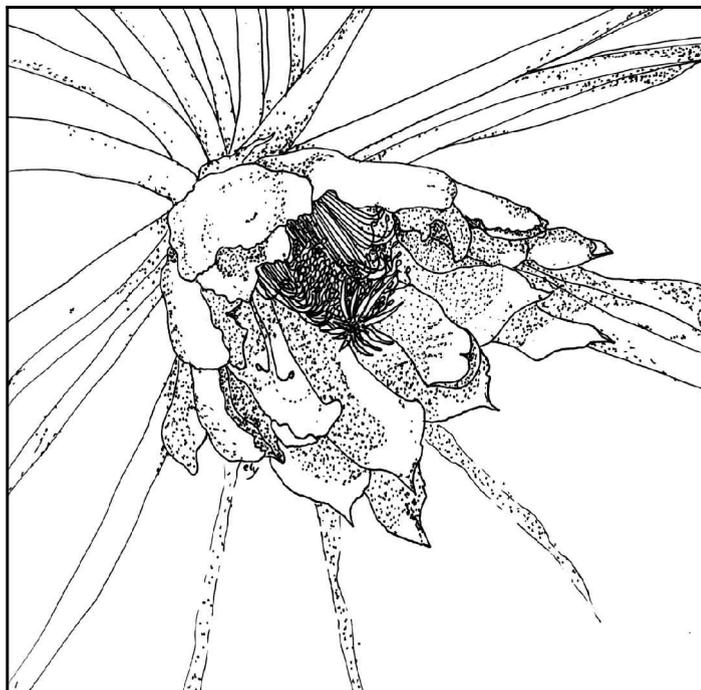
### A Weed for All Seasons

A better-researched, relatively strong, and generally antiarrhythmic herb is *Cytisus scoparius* (Scotch broom), formerly known as *Sarothamnus scoparius*. This Fabaceae family member originated in northern Europe but has since naturalized to many parts of the world. It is a pernicious weed in the Pacific Northwest, where it grows rapidly, crowding out native plants. This makes it a very sustainable source of medicine that should be more widely utilized to help keep it in check ecologically speaking.

The constituents of greatest interest in Scotch broom are quinolizidine alkaloids, particularly sparteine. According to Weiss, Scotch broom acts very similarly to quinine and quinidine, although Scotch broom is much safer.<sup>5</sup> Weiss recommended it for treating patients who have congestive heart failure to help regulate heart rhythm and, indirectly, to improve venous return. He cited the plant as a specific treatment for atrial or ventricular fibrillation and extrasystoles. These indications are echoed in other modern sources that also cite Scotch broom as specific for treating sinus tachycardia and postmyocardial infarction arrhythmias.<sup>6</sup>

Modern investigation has revealed that sparteine and related alkaloids antagonize potassium channels.<sup>7</sup> There is also evidence of sodium-channel antagonism.<sup>8</sup> There is a definite positive inotropic action from sparteine, apparently a result of its concomitant actions on sodium and potassium channels<sup>9</sup>—unlike many standard class I antiarrhythmic drugs (quinidine, mexilitene), which also inhibit calcium channels and are actually negative inotropic.

No published clinical trials were located on the efficacy of Scotch broom or sparteine. The recommended dose of Scotch broom herb tincture, made from fresh or dry plant material (45–55 percent ethanol) for an average-sized adult is 0.5–1 mL,



*Selenicereus grandiflorus* (night-blooming cereus or queen-of-the-night)  
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three times per day. The standard pharmacologic dose of isolated sparteine is 100–200 mg per day, in divided doses. Unfortunately the usual content of sparteine in crude Scotch broom could not be confirmed. Since 1977, the Food and Drug Administration has made injectable sparteine unavailable because of the unpredictability of its effects and its propensity to cause tetanic uterine contractions.<sup>10</sup>

Whole-plant extracts of Scotch broom at usual therapeutic doses are essentially without adverse effects and even overdose is rarely a problem.<sup>6</sup> The most likely adverse effects, if any, are bradycardia, indigestion, loose stools, and hypertension. The herb is contraindicated in pregnancy (although Scotch broom does have some application during labor as an oxytocic) and atrioventricular block (which it can exacerbate readily).<sup>11</sup> Some practitioners also consider Scotch broom to be contraindicated for treating hypertension because of the herb's vasoconstrictive properties.<sup>12</sup>

Much is known about the pharmacokinetics of sparteine because it is thoroughly and specifically oxidized by hepatic CYP 2D6. Approximately 5 percent of people of European descent are poor metabolizers of sparteine because of an inefficiency or lack of CYP 2D6.<sup>13</sup> In these patients, sparteine levels may build up to toxic levels.

Arguably, CYP 2D6 function should be assessed prior to administration of this herb although the cost effectiveness of this approach is questionable. Scotch broom or sparteine should not be administered simultaneously with drugs that inhibit CYP 2D6 function, including cimetidine; nor with many selective serotonin reuptake inhibitors, including fluoxetine and paroxetine, thioridazine, haloperidol, propoxyphene, and ritonavir. Even more



*Crataegus laevigata* (hawthorn). Photo by Holly Shull Vogel, Frost Flower Farm.

important is the fact that many antiarrhythmic drugs are CYP 2D6 inhibitors, including quinidine, flecainide, and amiodarone. Caution is warranted in combining Scotch broom with other antiarrhythmics for this reason.

It should also be noted that approximately 1 percent of populations of European descent are hypermetabolizers of sparteine as a result of excessive CYP 2D6 activity and these people would be unlikely to respond to Scotch broom therapy.<sup>14</sup>

Other drugs should not be combined with Scotch broom. Because of the presence of simple amines in the plant, it may cause problems if combined with monoamine oxidase inhibitors. It should also not be given with epinephrine because of the potential synergy of effects, particularly with regard to vasoconstriction and uterine contraction.

### Indian Snakeroot

Another potent, specific antiarrhythmic herb is *Rauwolfia serpentina* (rauwolfia), formerly known as Indian snakeroot, which comes from India. The root of this herb contains many interesting alkaloids. Of particular interest in the case of arrhythmias is ajmaline. Ajmaline is said to have been isolated by Salimuzza-man Siddiquil and named after Hakim Ajmal Khan, a strong advocate for Unani-Tib (Arab traditional medicine).<sup>15</sup>

In animal studies, isolated ajmaline has shown particular efficacy for preventing arrhythmias caused by cardiac ischemia.<sup>16</sup> Russian clinicians have found various rauwolfia preparations containing ajmaline to be effective for preventing supraventricular arrhythmias.<sup>17</sup> Because other lines of research support the

concept that the combined alkaloids of the plant are more effective than any alkaloid in isolation, the whole plant or whole plant extracts are recommended. The usual dose of a tincture, standardized to 0.1–0.125 percent reserpine (as a quality control), is 3–5 gtt, three times per day, for an average-size adult.<sup>18,\*</sup>

### Lily-of-the-Valley

The third, relatively strong herb for intervention for treating more serious arrhythmias is *Convallaria majalis* (lily-of-the-valley). This herb has a long history of use for people with mild congestive heart failure and it contains cardioactive glycosides.<sup>19</sup> Unlike the much stronger and more dangerous plant *Digitalis* spp. (foxglove), lily-of-the-valley glycosides do not accumulate and are vastly safer and produce milder effects. Lily-of-the-valley flavonoids are also considered to be important for the activity of the herb and this supports the use of the whole plant and not just the cardiac glycosides in isolation.<sup>20</sup>

Lily-of-the-valley has also long been recognized by clinicians to have an antiarrhythmic effect. Felter found it particularly useful for treating tachycardia and mitral insufficiency.<sup>2</sup> He found it less useful for addressing aortic valve problems. Animal studies support that lily of the valley has a positive inotropic effect and that it is a moderately strong vasoconstrictor.<sup>21</sup> In a bizarre twist, actual progesterone has been found in lily-of-the-valley, presumably in quantities too minute to be relevant to medicine but suggesting that humans and plants may have more hormonal regulation systems in common than was once thought.<sup>22</sup>

The usual dose of lily-of-the-valley, fresh-plant tincture (25–30 percent ethanol) is 0.5–1 mL, three times per day, for an average-sized adult. Although lily of the valley is very safe, it should not be taken in excess and the patient should be told to maintain a high intake of fruits and vegetables to guard against hypokalemia, which potentiates the toxicity of other cardiac glycosides. The herb should not be combined with potassium-wasting drugs, such as loop diuretics and corticosteroids, without careful monitoring of potassium levels. The onset of severe nausea, vomiting, or atrial fibrillation are all indications for discontinuation of the herb.

### Hawthorn: The Tonic

No discussion of plants for treating patients with arrhythmias would be complete without mentioning the ultimate cardiac tonic, *Crataegus laevigata* (hawthorn). This herb is so safe that it has no known overdose level. Its effects are very gentle, often taking weeks or months to become fully noticeable. For this reason, it is advocated as a chronic treatment to prevent and treat essentially all types of arrhythmias.

There is much less research on the antiarrhythmic activity of hawthorn than on its many other actions. However, some animal research has shown directly that the hawthorn species *Crataegus meyeri* is antiarrhythmic.<sup>23</sup> Surprisingly, researchers who did one rat study actually found *C. laevigata* standardized extract to be proarrhythmic in ischemic hearts.<sup>24</sup> It appeared that the calcium-

\*For a complete review of the intricacies of the clinical use and safety of rauwolfia for treating hypertension, an update of ref. 18 will be published in Yarnell E, Abascal K, Hooper CG. Clinical Botanical Medicine. Larchmont, NY: Mary Ann Liebert, Inc., 2003;in press.

channel antagonist activity of the herb was causing the problem. The extract was also administered by injection. In similar study, using the same methodology but using oral pretreatment with hawthorn, researchers found that it did reduce the incidence of postischemic fibrillation in rats greatly.<sup>25</sup>

Clinical trials of hawthorn in patients with congestive heart failure (CHF) have often reported secondary outcomes involving cardiac rhythm. In one large open trial (n = 3664), hawthorn was found to be particularly useful in patients who had CHF with tachycardiac arrhythmias.<sup>26</sup> In another large open trial (n = 1011), the incidence of arrhythmias and ventricular extrasystoles was notable and appeared to coincide with improve myocardial perfusion.<sup>27</sup> To confirm the antiarrhythmic nature of hawthorn, arrhythmia types and incidence should be assessed in future trials involving hawthorn as primary or secondary measures, both in patients with CHF and those with non-CHF-related arrhythmias.

Hawthorn can be taken in many forms. The leaves, flowers, and haws (fruit or berries) are all utilized. An infusion of 2–3 teaspoons per cup, steeped for 10–15 minutes, can be drunk three times per day. A tincture (25 percent ethanol) or glycerite (75 percent glycerin) is dosed at 3–10 mL, three times per day, for adults, depending on severity of the disease and body size. The usual dose of extracts standardized to 1.8 percent vitexin-4'-rhamnoside or to 10 percent procyanidins, is 100–250 mg, three times per day. As noted above, there are no known adverse effects of this herb and no contraindications.

## Summary

Numerous herbs are useful for treating patients with a wide range of arrhythmias. In all cases, *C. laevigata* is recommended for prevention and treatment as a gentle tonic. For treating mild arrhythmias not related to demonstrable heart pathology, simple sedatives such as *L. cardiaca* and *S. lateriflora* are recommended. For more serious cases or when milder remedies are not sufficient, *S. grandiflorus* or *H. undatus*, *C. scoparius*, *R. serpentaria*, and *C. majalis* offer more potent, although also potentially more dangerous, options. However, careful monitoring and proper dosing usually allow even these strong herbs to be utilized safely. □

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**Eric Yarnell, N.D., R.H.**, is president of the Botanical Medicine Academy, a specialty board for using medicinal herbs. **Kathy Abascal, B.S., J.D., Herbalist**, is executive director of the Botanical Medicine Academy, Vashon, Washington.

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