



# Allergic Reactions

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Allergic reactions are a very common and important set of symptoms for herbalists to learn to recognize and treat. They are a grouping of immunological reactions rather than a single disease. While their consequences are occasionally life-threatening (anaphylaxis and shock), there are many other less intimidating circumstances where the experienced herbalist can mitigate symptoms and offer relief. There are many types of allergic reactions; this paper will focus mainly on the category known as *Type I hypersensitivity* also known as immediate or anaphylactic-type reactions. (See below for differentiation of hypersensitivity types.) These are named due to the immediacy of the initial reactions. Initiators of these reactions include insect stings, pollen, stress, foods and drugs. Anaphylaxis may also result in this type of reaction. As this is one of the more dangerous consequences of an allergic reaction, it will be discussed in detail later.

Allergies are often tricky to diagnose and treat for a number of reasons. First, people display highly idiosyncratic reactions, which take on a diversity of symptom pictures. Allergies may also show up suddenly in someone with no previous history of sensitivity to an allergen. The converse may also happen; people with a previous sensitivity to a specific allergen may find themselves less reactive after a time.

**Hypersensitivity** is a disorder of the immune system, in which there is an over (hyper) reaction to an antigen, the substance causing the over-reaction.

Hypersensitivity reactions are classified by how they engage the immune system. This classification emphasizes how the immune system reacts with the antigen and the damage caused by the various immune components reaction to it. These categories are listed here to help distinguish the various immunological hypersensitivity allergic reactions from the one this paper is focused on, hypersensitivity type I.

## **Hypersensitivity types**

- **Type I- Immediate or anaphylactic type** (see below)
- **Type II- Cytotoxic type**- These reactions involve Immunoglobulin G (IgG) and IgM binding to and destroying the cell the antigen is bound on. This is seen in pernicious anemia, acute rheumatic fever and transplant rejections.
- **Type III- Immune complex-mediated reaction**- The immune complex occurs after an antibody binds to antigen and causing an abnormal activation of the complement system, which goes on to destroy local tissue. Examples include; glomerulonephritis and systemic lupus erythematosus (lupus, SLE)
- **Type IV- Delayed or cell-mediated reactions**- This type is mediated by T-cell lymphocytes rather than B-lymphocytes. The delay is due to the time it takes the T-cells and macrophages to mount a response, which may take from a few hours to a few days. Contact dermatitis such as poison ivy rashes are this type.

**Type I Hypersensitivity- Immediate or anaphylactic type.** These reactions come on shortly after contact with an allergen and are common. Some major risks exist in this category including anaphylaxis, bronchoconstriction and the most deadly being anaphylactic shock (explained below). In type I hypersensitivity an individual who has previously been sensitized to an antigen mounts a strong immunological response in their next encounter. It is caused by an antigen binding with a mast cell or basophil with pre-formed immunoglobulin E (IgE), which creates a cascade response involving the release of histamine, serotonin and other vasoactive substances. These agents also attract other white blood cells causing further reactions. Depending on the severity of the response these substances alter blood vessels, smooth muscle and are pro-inflammatory. These can take the form of local or systemic responses. Local responses include, nasal congestion and discharge, wheal and flare, and hives. Major systemic reactions include difficulty in breathing and vascular permeability.

Many type I reactions have 2 distinct phases, the early phase and the late phase reactions. The early phase reactions are usually noticeable within 5-30 minutes after contact. Its effects may include vasodilation, bronchoconstriction, increased capillary permeability, smooth muscle contraction and mucous secretion. These may subside within 1 hour. The late phase reactions occur from 2 to 8 hours after initial exposure. These symptoms are often similar to early phase reactions but are more intense and persistent. Late phase symptoms include greater inflammation of tissue, sluggishness and lethargy. These different reactions are caused by the different chemical mediators released by the body during early and late phase contact with an antigen.

#### **Examples of type I hypersensitivity**

- |                      |                         |
|----------------------|-------------------------|
| 1) Allergic rhinitis | 4) Insect venom allergy |
| 2) Food allergy      | 5) Allergic asthma      |
| 3) Drug allergy      |                         |

Many substances (generally proteins) can act as allergens and cause allergic reactions. One of the frustrating aspects of treating hypersensitivity reactions is the difficulty of figuring out the causative agent, as they are often hard to pin down. Some common allergic reactions include;

- 1) **Allergic rhinitis** (AR) is a broad title for one of the more common allergic reactions. Its symptoms include; sneezing, itching, nasal congestion, itchy eyes, and rhinorrhea. Two major categories are seasonal allergic rhinitis (SAR) and perennial allergic rhinitis (PAR). SAR is usually associated with pollen exposure (hay fever). PAR is characterized as occurring approximately nine months a year. Some of the allergens include; pollens, molds, animal dander, and dust mites. AR affects an estimated 20-40 million people in the United States.

- 2) **Food allergy**- While there are some commonly identified ones (i.e.; wheat, dairy, peanuts, etc), individuals may react to a wide variety of ingested articles. Food journals and elimination diets may help figure out the allergenic agent.
- 3) **Drug allergy**- Many drugs can cause an array of systemic allergic reactions including penicillin, aspirin and sulfonamides
- 4) **Insect venoms**- This is a group of insects (Order; Hymenoptera) including bees, wasps, hornets, yellow jackets and ants whose sting or bite may produce a hypersensitive response. These are particularly dangerous allergic responses as the venoms are injected subcutaneously and may elicit a deadly anaphylactic reaction after prior sensitization. These insects are also common around human habitations and it may be hard to avoid getting stung.
- 5) **Allergic asthma**- Asthmatic hypersensitivity reactions may be caused by a variety of inhaled aeroallergens including pollen, animal dander, mold and dust mites. Symptoms include difficulty in breathing, wheezing, anxiousness, cough with thick bronchial mucous. Exercise, sudden temperature changes (usually cold induced) and stress can trigger an attack.

**Anaphylaxis** (ana-up; phylaxis-protection) is a potentially life-threatening allergic reaction. It is caused by re-exposure to a previously encountered antigen.

Anaphylaxis can be triggered by a number of sensitizing agent, including; food, drugs, chemicals and insect venoms,

Anaphylaxis is the result of an antigen-antibody reaction. When this reaction is formed basophils and mast cells release histamine and other vasoactive mediators, which in turn may cause bronchoconstriction, and widespread vasodilation resulting in a greatly reduced peripheral blood flow and lowered cardiac output with circulatory collapse leading to shock. Due to the severity of this situation, proper treatment needs to be immediately administered or death may ensue in matter of minutes.

Management of anaphylactic shock includes giving an injection of epinephrine (i.e.; an EpiPen), administration of fluids and oxygen and other methods to reduce shock.

### **Symptoms of Anaphylaxis**

Arrhythmia	Laryngeal edema
Diarrhea	Nausea
Hyperemia	Shock
Hypotension	Shortness of breath
Intense anxiety	Sweating
Itching, general or localized	Weakness

## Common/Scientific Plant Names

- |                                          |                                       |
|------------------------------------------|---------------------------------------|
| 1) Anemone - Anemone spp.                | 11) Nettles - Urtica spp.             |
| 2) Bayberry - Myrica spp.                | 12) Osha - Ligusticum porteri         |
| 3) Beggar's Ticks - Bidens spp.          | 13) Plantain-Plantago spp.            |
| 4) California poppy - Eschscholtzia spp. | 14) Ragweed- Ambrosia spp.            |
| 5) Echinacea – Echinacea spp.            | 15) Skullcap- Scutellaria lateriflora |
| 6) Eyebright - Euphrasia spp.            | 16) Slippery elm - Ulmus rubra        |
| 7) Goldenrod - Solidago spp.             | 17) Valerian-Valeriana officinalis    |
| 8) Licorice - Glycyrrhiza spp.           | 18) Willow- Salix spp.                |
| 9) Ma Huang - Ephedra spp.               | 19) Wolfberry - Lycium spp.           |
| 10) Meadowsweet-Filipendula ulmaria      | 20) Yerba santa - Eriodictyon spp.    |

## Categories of Herbal Therapies

**Antihistamine type** - act like conventional antihistamines in that they quickly reduce the severity of the allergic response. This category is based largely on clinical observations on how these herbs *appear* to be working. Whether or not they actually antagonize histamine remains to be researched.

Eyebright      Osha  
Ragweed

**Antiinflammatories**- Counteracts or reduces inflammation

Licorice      Meadowsweet  
Willow      Turmeric

**Anxiolytics**-reduce the sensation of stress or anxiety

Anemone                      Skullcap  
California poppy              Valerian

**Astringents**- tighten membranes and capillaries helping to reduce congestion

Oak                      Witch hazel  
Bayberry              Blackberry root

**Constitutional therapies**- are a wholistic approach to treating the person and the reason they are susceptible to allergic responses. This incorporates individualized herb formulas in a tonic approach.

**Decongestants**- relieve congestion, often drying out mucous membranes

Bayberry	Ragweed
Beggar's ticks	Wolfberry
Eyebright	Yerba santa

**Drawing agents-** draw out substances from underneath the skin.

Activated charcoal      Slippery elm

Clay

**Preventative-** help prevent future outbreaks

Nettles

Goldenrod

**Sympathomimetic-** mimic the sympathetic nervous system reducing bronchoconstriction

Ma huang

**Topical relief-** relieve external itchiness

Slippery elm      Clay

Plantain

## Glossary

- **Aeroallergen-** any airborne allergen, such as pollen or molds
- **Allergen-** a substance that elicits a hypersensitivity reaction
- **Anaphylaxis-** a severe hypersensitivity reaction. See above
- **Antibody-** see Immunoglobulin
- **Antigen-** a substance that causes the formation of an antibody and elicits a reaction from that antibody
- **Atopic-** a hereditary tendency to developing immediate allergic reactions often in the form of rashes and allergic asthma
- **Basophil-** immune cells that contain histamine and other chemicals that mediate inflammation and allergic reactions
- **Complement system-** a group of plasma proteins associated with immunity that act as chemoattractants and lyse (put holes into) pathogens.
- **Cytokine-** proteins produced by nucleated cells in response to stimuli. They act as intercellular mediators and generally act locally on nearby cells
- **Desensitization-** a process to reduce individual response to an antigen
- **Histamine-** a chemical in basophils and mast cells released in allergic, inflammatory reactions, which dilates blood vessels and constricts smooth muscles of the bronchi.
- **Hives-** see Urticaria
- **Hymenoptera-** an order of insects including bees, wasps, hornets and ants
- **Hyperemia-** a reddened area due to increased blood flow
- **Hypersensitivity-** an abnormal excessive reaction to a stimuli
- **Immunoglobulins-** are antibodies produced by B lymph cells. Each type of immunoglobulin responds to a specific antigen, which they target and mount a defense.
- **Mast cells-** similar to basophils but are found concentrated in connective tissue.
- **Papules-** a small solid red raised skin lesion. A pimple

- **Psychogenic**- a condition originating in the mind
- **Rhinorrhea** – nasal discharge of free flowing, thin, watery fluid
- **Shock**- a severe generalized circulatory failure. It may arise from multiple causes. Inadequate peripheral blood flow and low cardiac output cause tissue damage and a progressively worsening positive feedback loop.
- **Urticaria**- an intensely itchy skin condition characterized by transient wheals and papules.
- **Wheal and Flare reaction**- a skin eruption following an allergic reaction characterized by a raised pale patch surrounded by a red area. May be itchy