Unknown Skin Irritations: A General Guide

Everyone has felt the pain or itchiness of an insect bite at some point in their lives. These sensations can cause a great deal of stress and anxiety. However, numerous other causes of itchy, tingly, irritated skin can mimic the sensations of insects touching or biting us, such as:

- allergies
- static electricity
- fibers
- household cleaning products
- imbalanced diet
- medications
- illness
- clothing

Bites from Insects, Mites, and Other Arthropods

Figure 1: *Most arthropods that bite people are easily seen with the naked eye. Clockwise from the top left, a bed bug, a tiger mosquito, an embedded tick and a biting midge. Photos by Matt Bertone and Jim Kalisch.*

Insects or mites are often the first suspects when people are trying to figure out what has irritated their skin. Most arthropods that feed on people, such as mosquitoes, deer flies, bed bugs, lice, fleas, ticks, black flies, biting midges, kissing bugs/conenose bugs and even bird or rodent mites, are easily seen without a microscope.

Some insects may bite humans in defense or in an attempt to feed, including wheel bugs, minute pirate bugs and thrips. These are also visible without magnification. An urban/medical/veterinary entomology Extension specialist or Extension agent can assist with identifications.

Finally, some pests do require magnification to be seen, such as straw itch mites, chiggers and scabies mites. An urban/medical/veterinary entomology Extension specialist or Extension professional may be able to help identify itch mites and chiggers, but a medical professional should be the one to confirm scabies identification. A positive scabies diagnosis should only be made when a scabies mite has been removed from its burrow in the skin. A positive diagnosis of scabies should never be made from anecdotal evidence and/or visual observation.

Should You Spray?

If there is suspicion that insects are responsible for the irritation on the body, it is essential to determine what pest is present. A pest should be identified before pesticides are applied. In some cases, pesticides may not be the best choice for the issue at hand. Consulting an entomologist, Extension professional or certified/licensed pest management professional can help make sure that applications are done safely and effectively. Misuse of these products can cause a myriad of issues, including possibly exacerbating skin irritations and the sensation of being bitten.

Checklists to Help Identify Potential Causes of Skin Irritation

Checklist 1 is offered as an informational tool to be used by an Extension agent or specialist. If no insect or mite is found, consider reviewing possible environmental factors or medical causes in Checklist 2 with a healthcare provider.

Checklist 1 works best with a submitted "sample," a representative specimen that requires further identification. When submitting a sample to an Extension agent or specialist, remember these professionals cannot accept items originating from the human body (scabs, skin, blood, other body fluids such as urine or nasal discharge, or bowel movements also called stool or poop), as they are not trained to handle these safely. These kinds of samples from the human body should only be submitted to a healthcare provider but contact your healthcare provider before submitting these specimens.

Extension agents/specialists can look at potential arthropods to determine if an insect or mite is the source of your skin irritation. Before submission, first, contact your local Extension office to learn how to submit a sample.

Checklist 1. Potential Arthropod Causes of Itchy, Tingly or Irritated Skin

AGENTS/SPECIALISTS: Before checking "yes" for an arthropod, an urban/medical/veterinary entomology Extension specialist or Extension agent/specialist should confirm the identification.

Arthropods – to be completed by an Entomologist or Extension Specialist/Agent	Yes
Small arthropods needing a microscope or specialist to identify	
Mites (**scabies mite**, **larval chiggers**, **straw itch mite**, **oak itch mite** and others)	
Small arthropods visible with the naked eye or magnifying lens	
Mites (**bird** or **rodent mites**, food-infesting mites and others)	
Blood feeders (**biting midges or no-see-ums**, **bed bugs**, **black flies**, **fleas**, **kissing bugs**, **lice**, **ticks**, **deer keds**, **mosquitoes**, **biting flies such as deer flies**, **horse flies**, stable flies)	
Incidental biters (**thrips**, assassin bug, **brown recluse spider**, **black widow spider** and others)	
Stinging (**imported fire ants**, **Asian needle ant worker and queen**, **other stinging ants**, **bethylid** and other wasps, **dermestid beetle** larval shed skin, **stinging caterpillars**)	
Rabbit or rodent **bot flies**	

Non-Insect Causes of Biting and Crawling Sensations

As highlighted in Checklist 2 on the next page, there are other possible answers to why someone's skin is irritated.

Synthetic and Natural Factors

In the home and workplace, numerous physical or chemical environmental factors may induce the sensation of itching, crawling or other irritation to the skin.

- Cleaning and personal products: laundry detergent, ammonia-based cleaners, hand soaps, cosmetics, deodorants and hair products can irritate the skin (Hinkle 2000).
- Industrial irritants: Particle board, floor tiles, some papers, insulation fibers, wall coverings, cigarette smoke, printer ink and fresh asphalt may cause skin irritation (Hinkle 2000).
- Static electricity: With low humidity, static electricity can be a problem with carpeting, copiers, plastic-covered clothing and fabric-covered furniture. Low humidity causes paper shards and fibers to become static electrically charged and leave a small, red, raised area when they hit dry skin. This typically occurs in hospitals, office buildings, communal living spaces, warehouses and buildings with closed ventilation systems (Potter 2018; Hinkle 2000).
- Mold infestations: Damp or water-damaged buildings can promote mold. Some mold and mold spores can cause skin irritation (Clark and Adinoff 1989).
- Outdoor plants: Poison ivy, poison oak, poison sumac, stinging plants and heat rash can cause skin aggravation (Lofgran et al. 2022; Anderson et al. 2003; Murota et al. 2016).
- Pollen: Exposure to pollen from trees, weeds and grasses can induce a skin reaction. This can feel like insects biting (Clark and Adinoff 1989).
- Pesticides: Exposure to some pesticides could result in contact dermatitis and prickling sensations among other negative health outcomes.

Medical Causes

If no issues with contaminants or allergens are found, there could be a medical cause behind these sensations. Review the checklist on the next page and consider consulting a medical professional for more information about environmental factors and medical causes of skin sensations.

Checklist 2. Potential Environmental or Medical Causes of Itchy, Tingly or Irritated Skin

For possible review by a healthcare provider. If no insect or mite was found that could cause the skin sensations experienced, environmental factors and medical causes should be considered.

Even though there is a lack of evidence for insects or mites and an alternative cause may be identified, some sufferers may maintain that an insect is the culprit. This can be triggered by an event including retirement, deaths of loved ones, job loss and previous issues with pests (such as bed bugs). However, this may be the time to explore other causes of skin irritation.

Environmental factors - for possible review by a healthcare provider
Possible physical irritants or environmental conditions
Fibers (clothes with coarse fibers, paper, fabric or insulation fibers)
Low humidity and seasonal changes in temperature
Static electricity
Heat exposure resulting in rash
Plants (poison ivy, poison oak, poison sumac by contact or smoke and stinging plants)
Possible chemical irritants
Cleaners (ammonia, household cleaners, laundry detergent)
Cosmetics and perfumes
Building-related (solvents/resins associated with paints and adhesives, wall paint, formaldehyde from particle board, wall and floor coverings)
Pesticides
Printing ink

Potential medical causes – for possible review by a healthcare provider
Allergies (including **medication**, **mold**, **pet dander**, **cockroaches** and other insects, **pollen** or other substances/organisms in your environment)
Medications (including prescribed, over the counter and supplements)
Neurological disorders (**Alzheimer's dementia**, **multiple sclerosis**, **Parkinson's disease**, **stroke**, **neuropathy**, etc.)
Infectious diseases (**shingles**, **flu**, **HIV**, **fungal**, **sexually transmitted infections**, **MRSA**, etc.)
Systemic illnesses (including **cancer**, **diabetes**, **chronic pain**, **psoriasis or eczema**, **fibromyalgia**, **long COVID**, **liver disease**, **kidney disease**, **thyroid disease**, **heart disease**, some **chronic and autoimmune diseases**)
Nutritional deficiencies including **iron** (anemia), vitamins and minerals
Parasites (**hookworm**, **pinworm**, **protozoans**)
Recreational substances (including **alcohol**, **amphetamines** or other drugs)
Psychogenic conditions (**depression**, **anxiety**, **stress**, **delusional parasitosis** or infestation, other psychogenic diseases)
Physiological conditions (**pregnancy**, **menopause**, etc.)

How to Determine the Cause of Unknown Skin Irritations

If someone is experiencing skin irritation, and no arthropod has been found by a trained entomologist or similar professional, environmental factors or medical causes may be responsible. These individuals are encouraged to review the potential causes in Checklist 2 with their healthcare provider to help identify the cause.

This fact sheet provides basic information for educational purposes and should not replace medical advice. Talk to your healthcare providers about the questions that you may have and what may work for your health.

Unknown Skin Irritations: A General Guide was developed by individuals from the following institutions or companies:

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