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Keep House Mice Away This Winter

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House mice are some of the most common commensal rodents found in community environments all over the world. Adult house mice are small (1/2 – 1 ounce in weight), grayish-brown rodents measuring about 5-7 inches in length including the tail. They have a pointed snout, relatively large ears, and small black eyes. The ears and tail are almost hairless, and the tail is marked with scaly rings. The upper side of the body is covered with short grayish brown or tan hair, and the underside of the body is lighter than the upper side (but not white). The feet are hairless and grayish pink in color.



Figure 1. Adult house mouse. Photo: Shutterstock.

House mice move by walking or running on all four legs, but are also known to jump, stand on their hind feet using the tail for balance (Figure 1). They can also climb up rough vertical surfaces, to reach up to a food source or nesting site. They prefer to maintain contact with vertical surfaces such as walls as they move. **Young mice can squeeze through openings as small as ¼ inch in diameter.**

Damage caused by house mice

In human homes and structures, house mice are omnivorous and will feed on almost any human food material (Figure 2) as well as many other household items including cardboard, soap, leather, etc. Before feeding, they test the material by nibbling and this can cause unsightly chew or gnaw marks. They thrive in food storage areas or pantries if undetected for a long time, where along with consuming and damaging food and food packaging materials, they contaminate everything with their urine and droppings, and this can also cause a musky odor.



Figure 2. House mice feed on a wide variety of different foods. Photo: Shutterstock.

Outdoors, house mice can occasionally damage crops and garden plants. They are known for their preference for seeds and grains, which they will consume in the field as well as bring to their nests for storage. House mice can physically destroy a variety of materials found in homes and structures such as paper, cardboard, wood and cloth by shredding them to make nests. They can also cause structural damage to furniture, upholstery, woodwork, electrical (Figure 3) and plumbing lines, computer systems and machinery by chewing or gnawing in an attempt to reach food or nesting sites.



Figure 3. This house mouse has damaged the power cord by gnawing. Photo: Adobe Stock Images.

House mice are known to **carry and spread pathogens that cause murine typhus, bubonic plague, leptospirosis and food poisoning**. They can spread parasites such as fleas, mites, tapeworms and ticks to humans and domestic animals. Additionally, their urine contains allergens that circulate in the air and can be asthma triggers for sensitive individuals. House mice are not susceptible to SARS-CoV-2 infection, nor are they carriers of the deadly hantavirus (but the similar species-deer mice are known to carry it).

House mouse look-alikes

Several other small rodent species found in and around homes and structures, e.g., deer mice and meadow voles (Figure 4), can be mistaken for house mice. House mice can also be mistaken for young black or brown rats.



Figure 4. Deer mice (left, Photo: Gregory 'Slobirdr' Smith) and meadow voles (right, Photo: Adobe Stock Images) can be mistaken for house mice.

How do you know if you have house mice in your building?

House mice are nocturnal by nature and tend to avoid light but can occasionally venture out during the daytime in search of food. They are intelligent and cautious and easily escape notice. Signs of their presence are often found before the mice themselves.

Droppings: House mouse droppings are between $\frac{1}{8}$ and $\frac{1}{4}$ of an inch long, similar in size and shape to rice grains (Figure 5). They defecate at or near where they feed and near, but not in their nest. They urinate continuously producing thousands of microdroplets of urine each day. The urine fluoresces and can be seen using a black light (UV) in an otherwise dark room. However, it is important to be aware that many substances fluoresce under UV light including some cleaning solutions.



Figure 5. House mice droppings and urine. Photo: Dawn H. Gouge.

Droppings can tell us where the mice are hiding and where they usually travel. This can help you determine which entry points need sealing up, food supplies that may be contaminated, and the best locations to place traps to catch indoor mice.

Tracks: Footprints may be found in house dust, spilt flour, or other powdery substances.

Teeth marks and chewing (Figure 6): Small holes in food packaging, chew marks on belongings and edges of baseboards and walls are all signs of mouse activity. Check food packaging in storage cupboards for spills and holes. Look for holes into protective voids which have tooth marks and/or fine hairs around the edges. House mice passing through entry points leave hairs attached to the edges of the openings.



Figure 6. Gnaw marks on a fall pumpkin. Photo: Adobe Stock Images.

Sound: Listen for quiet scampering and scratching in wall voids and above ceilings, or occasional squeaks that are inconsistent and more common at night. If sounds are consistent or predictable this indicates a mechanical or structural issue unrelated to wildlife.



Figure 7. Mouse nest with young ones. Photo: Kelly Madigan.

Nests and stash piles: House mice build nests in undisturbed, enclosed spaces (Figure 7). They shred fabric, paper, cardboard, furniture stuffing, wool, building insulation, and plant material to form loose ball-shaped nests 4-6 inches in diameter. House mice will also hoard food in stash sites within their limited range of travel (Figure 8). So, finding piles of cached pet food, human food scraps, rodenticide bait and other edibles is quite common when an infested home is undergoing a deep clean and clutter removal.



Figure 8. House mice stash pile in a kitchen cabinet. Photo: Shaku Nair.

Pantry pests including beetle and moth species as well as many other foraging insects may be traced back to a house mouse food stash, nest, or dead mouse carcass.

Smudge marks (rub marks): These marks occur along frequently used travel routes on baseboards, pipes, and other conduits. They darken over time as oil and dirt rubs off the rodent's body as mice move along the same routes of travel repeatedly (Figure 9). Smudge marks contain chemicals mice use to communicate and should be removed by cleaning with soap and water.



Figure 9. House mice entry point beside a faceplate. Note oily rub mark at the hole entrance. Photo: Susannah Reese, StopPests.org.

Shredded materials: House mice will use insulation materials to nest within. They will also move insulation materials to nest sites. Finding wall void and attic insulation pulled out or in unexpected places can be an indicator of mouse activity (Figure 10).



Figure 10. Stove insulation is pulled out for nesting material under a stove. This is a common place to find nests, there's food and warmth. Photo: Susannah Reese, StopPests.org.

Odor: House mice have a musky ammonia smell that is often more noticeable in enclosed areas like pantries, cabinets, and drawers. The urine smell is often stronger along baseboards and walls that they move along depositing microdroplets of urine as they go. Extremely pungent odors of decay can result from dead mice as their bodies decompose.

Managing house mice

If you suspect you have house mice act quickly. Get expert advice or contact a pest management company with a good track record of resolving rodent infestations in homes. An integrated pest management approach will include all of the following elements:

- Reducing access to food resources - improving sanitation, pet food and waste management habits so no food is accessible overnight.
- Pest proofing to prevent mice from coming in from outside - sealing interior wall void openings like gaps around pipes and electrical conduits and securing food in storage containers to prevent mice accessing stores.
- Safe catch or trapping and removal of interior mice.
- Inspection and ongoing monitoring for signs of indoor mouse activity.

A publication for school facility managers can be found at https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/em9062_1.pdf

A publication for housing managers can be found at <http://www.stoppests.org/what-is-ipm/using-ipm/property-manager-ipm-guides/>.

A publication on pest proofing your home against house mice and other pests can be found at <https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1677-2015.pdf>

We Want Your Ticks



The Border Tick and *Rickettsia* Surveillance (BiTeRS) program of the Pacific Southwest Center of Excellence in Vector-Borne Diseases offers services to enhance surveillance for ticks and tick-borne pathogens of human health concern in California and Arizona. This is made possible through our project leaders at the University of California, Davis, the University of Arizona, and collaborating local and state agencies, including the California Department of Public Health and the Arizona Department of Health Services.

We work with partner organizations to:

- Perform surveillance for ticks and tick-borne diseases in their area.
- Learn about risks of tick-borne diseases in their area by testing ticks for pathogens/diseases.
- Collect and submit ticks for identification and testing.
- Report results of tick identification and pathogen testing to submitting partners.
- Provide training on ticks and tick-borne diseases.

Partner organizations may be:

- Government entities (local, tribal, county, or other).
- Workplaces with potential for tick exposures e.g., animal control, rescue, or veterinary clinics.
- Pest control services, or groups with potential tick exposure.

Download the BiTeRS Flyer for distribution: <https://pacvec.us/biters/>

What the Heck Was This?



Identify this red and black butterfly.

Answer: The Red Admiral (*Vanessa atalanta*, Family Nymphalidae).

Congratulations to Master Pest Detectives:

Maria Goodman, Karen Austermiller, Debbie Allen, Marty Boxer
Yavapai County Master Gardeners

What the Heck is This?



If you know the answer, email Dawn at dhgouge@arizona.edu. You will not win anything if you are correct, but you will be listed as a “Master Pest Detective” in the next newsletter issue.

**We will be back in January 2024.
Meanwhile, please share your thoughts about our newsletter at**

https://uarizona.co1.qualtrics.com/jfe/form/SV_cMhZ82JodDKJgCa

We wish our readers a peaceful and joyous holiday season!

Upcoming Events

Register now: Pest Management and Pesticide Safety Seminars for Turf and Landscapes, organized by the UA Turfgrass Science Program.

Tuesday, November 28th at Ocotillo Golf Club Pavilion, 3751 S. Clubhouse Drive, Chandler AZ 85248

Wednesday, November 29th at Lecture Hall, Recreation Centers of Sun City West, 19803 R.H. Johnson Blvd, Sun City West, AZ 85375

Both events will feature the same content, with presentations by experts on various aspects of turf and landscape pest management and pesticide safety. Six AZ Dept. of Ag. ESD (Ag.), PMD (OPM) and GCSAA **CEUs are approved**. For more information, please contact Shaku Nair at nairs@arizona.edu.

Registration: <https://tinyurl.com/yeyj7mx7>

Arizona Pest Professional Organization (AZPPO) and University of Arizona Public Health IPM Program invite you to this in-person training:

Master the Big Four: A Two-Day Public Health Academy on Mosquitoes, Flies, Roaches, and Bed Bugs.

November 29-30, 2023 at Maricopa Agricultural Center, 37860 W. Smith-Enke Rd. Maricopa, AZ 85138.

Each day includes 6 AZ PMD CEU hours. Breakfast and Lunch included!

Register here: <https://www.azppo.org/event-5409006>

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PROFESSIONAL ORGANIZATION

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www.azppo.org/events

EPA Webinars about Integrated Pest Management (AZ CEUs available)

Upcoming webinar: **Beech Leaf and Bark Diseases: Emerging Threats to Beech Trees.** *December 5, 2023 | 12:00 – 1:30 PM MST.*

Diseases impacting beech trees are an emerging forest health threat. The iconic American beech has been prized for centuries by people for its dense, shady canopy, form, stature, smooth bark, and the many nuts that benefit wildlife. Two recently emerged diseases – beech leaf disease and beech bark disease - have arborists, foresters, and homeowners concerned. These diseases also attack the European and other beech varieties. Beech leaf disease, associated with a nematode, causes leaf death, crown thinning, and eventual tree death. Beech bark disease results from an infestation of beech bark scale that predisposes trees to fungal infection. These fungi kill the inner bark tissue leading to tree death. As beech trees are some of the most desired specimen trees in public and private landscapes, these diseases are affecting people's property values, and public park landscapes.

Register at: <https://attendee.gotowebinar.com/register/4483444913702781023>

View recordings of archived EPA Integrated Pest Management Webinars at <https://www.epa.gov/managing-pests-schools/upcoming-integrated-pest-management-webinars>.

For more information about the EPA Schools program: <http://www.epa.gov/schools/>

Improving Environmental Health in Schools Webinar November 16, 12:00 PM MST

"When the school building is safe, students and educators are more able to get down to the business of learning, undistracted," Janet Hurley stated in her **recent article** as a call to action to improve environmental health in schools. Many school buildings do not meet minimum code requirements resulting in poor environmental health.

Learn how to improve your school's environmental health and indoor air quality through green cleaning, measuring success of IPM programs, staff training, hiring vendors and engaging decision-makers during the next Pest Defense webinar. This webinar will host a panel of IPM professionals Janet Hurley, Tim Stock, Lynn Rose and Leah McSherry on November 16 at 1:00 PM CST.

Register at <https://us06web.zoom.us/meeting/register/tZAofu2vrTwuEtYtM-5V-NnmhippNH5K2HVI#/registration>

** After registering, please take this [short one-item survey](#) to narrow down topics of discussion.

What's Bugging You? First Friday Events (New York State IPM Program)
Fridays | 12:00 pm. – 12:30 p.m. EDT | Zoom | Free; registration required

In this monthly virtual series, we explore timely topics to help you use integrated pest management (IPM) to avoid pest problems and promote a healthy environment where you live, work, learn and play. What is IPM? It's a wholistic approach that uses different tools and practices to not only reduce pest problems, but to also address the reasons why pests are there in the first place. Each month, our speakers will share practical information about how you can use IPM. **Register for upcoming events.**

- December 1: Houseplant IPM | Firewood pests

What's Bugging You First Friday events are in **Spanish** this year. Individuals interested in these events can find more information on this website: <https://cals.cornell.edu/new-york-state-integrated-pest-management/outreach-education/events/whats-bugging-you-webinars/conozca-su-plaga>

Urban and Community IPM Webinars (Host: University of California)

UC Statewide IPM Program Urban and Community webinar series is held the third Thursday of every month to teach about pest identification, prevention and management around the home and garden. This series is free but advanced registration is required. Dates and topics below, all begin at noon Pacific. <https://ucanr.edu/sites/ucipm-community-webinars/>

For more information about the EPA Schools program: <http://www.epa.gov/schools/>.

To view previous University of Arizona newsletters, visit:

<https://acis.cals.arizona.edu/community-ipm/home-and-school-ipm-newsletters>.

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We respectfully acknowledge the University of Arizona is on the land and territories of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with Tucson being home to the O'odham and the Yaqui. Committed to diversity and inclusion, the University strives to build sustainable relationships with sovereign Native Nations and Indigenous communities through education offerings, partnerships, and community service.