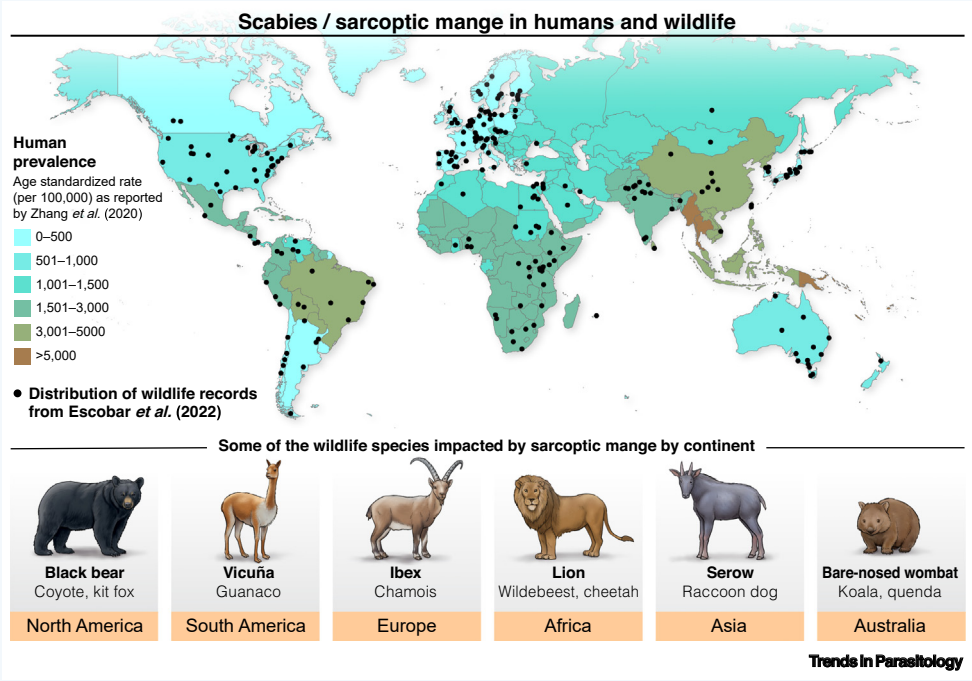
Trends in Parasitology | Parasite of the Month

Sarcoptes scabiei (scabies mite)

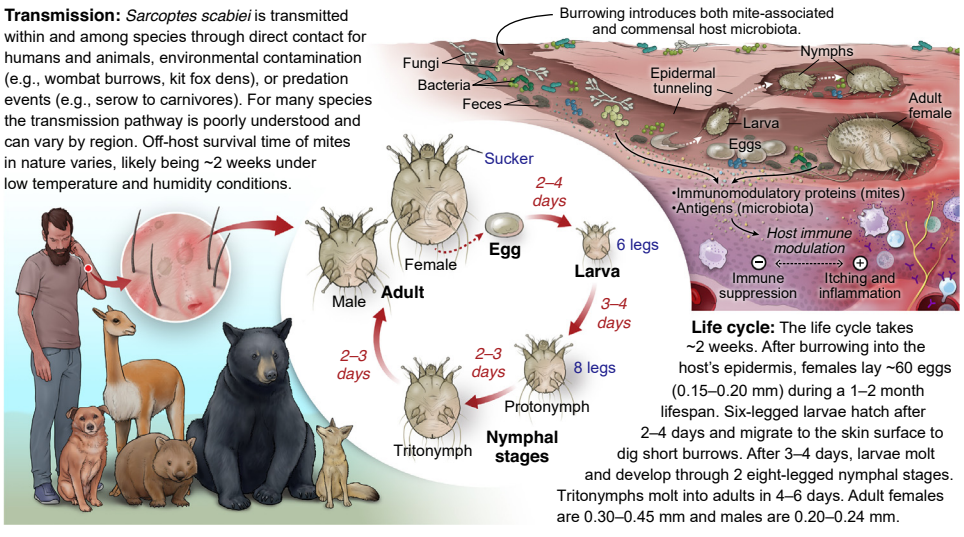
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Sarcoptes scabiei, causative agent of sarcoptic mange in domestic and wild mammals and scabies in humans, has a documented history spanning thousands of years. It has adapted to a diverse, partially explored host range, exhibiting high specificity but occasional cross-species infestation. Today, *S. scabiei* is globally distributed in >150 mammalian species. As an obligate parasite, its entire life cycle occurs on the host, with no long-term environmental reservoirs. Disease is predominantly associated with wildlife, but it remains a significant health burden in humans and domestic animals. Infestations result in intense itching, hair loss, skin damage, and secondary infections. In some wildlife species, outbreaks have caused catastrophic declines, localized extinctions, and disrupted ecosystems, with new hosts emerging. Avermectins and isoxazolines are effective, but treatment of wildlife is challenging. The complex ecology of *S. scabiei* highlights its One Health importance.

Transmission: *Sarcoptes scabiei* is transmitted within and among species through direct contact for humans and animals, environmental contamination (e.g., wombat burrows, kit fox dens), or predation events (e.g., serow to carnivores). For many species the transmission pathway is poorly understood and can vary by region. Off-host survival time of mites in nature varies, likely being ~2 weeks under low temperature and humidity conditions.



Life cycle: The life cycle takes ~2 weeks. After burrowing into the host's epidermis, females lay ~60 eggs (0.15–0.20 mm) during a 1–2 month lifespan. Six-legged larvae hatch after 2–4 days and migrate to the skin surface to dig short burrows. After 3–4 days, larvae molt and develop through 2 eight-legged nymphal stages. Tritonymphs molt into adults in 4–6 days. Adult females are 0.30–0.45 mm and males are 0.20–0.24 mm.

KEY FACTS:
Sarcoptic mange is among the most burdensome and generalist mammalian parasitic diseases. Primary hosts vary by region (e.g., carnivores in North America and ruminants in Asia) and scabies is a neglected tropical disease, affecting >400 million people annually.

Sarcoptic mange can be sporadic, endemic, or epidemic in wildlife. Host population declines (e.g., bare-nosed wombat) and localized extinction (e.g., vicuña) can occur. New hosts are still documented (e.g., Bennett's wallaby) while disease continues to emerge (e.g., black bear).

Transmission varies from primarily density to frequency dependent.

Major research themes include transmission, immunopathology within and across species, and sustainable management.

DISEASE FACTS:
Lesions include alopecia (non-humans), hyperkeratosis, erythema, and pruritus. Disease is characterized as 'ordinary' or 'crusted' based on severity.

Disease spans a spectrum from transient skin irritation (humans) to skin crusting, emaciation, secondary infections and fatal complications (some wildlife).

Therapeutics exist but are not ovicidal, most requiring repeated applications. Disease management is hindered by delivery challenges in wildlife, non-compliance in humans and domestic animals, and potential drug resistance.

TAXONOMY AND CLASSIFICATION:
PHYLUM: Arthropoda
CLASS: Arachnida
ORDER: Sarcoptiformes
FAMILY: Sarcoptidae
GENUS: *Sarcoptes*
SPECIES: *S. scabiei*

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Declaration of interests

The authors declare no competing interests.

Resources

www.capcvet.org

www.cdc.gov/dpdx/scabies/index.html

www.who.int/news-room/fact-sheets/detail/scabies

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