



Avian Malaria in Garden Birds

Agent

Avian malaria is a disease caused by microscopic haemoparasites (blood parasites) from the genus *Plasmodium*. There are over 50 species of *Plasmodium*, several of which have been detected in British birds.

Species affected

Globally, avian *Plasmodium* infection has been reported on every continent except Antarctica, in a wide variety of bird species. Most reports involve passerines (perching birds) and severe disease outbreaks have affected isolated island bird populations. In Hawai'i, the inadvertent introduction of *Plasmodium* along with its mosquito vector to the archipelago led to the extinction of over 20 species of endemic birds.

In Great Britain, *Plasmodium* parasites have been detected in a variety of garden birds including house sparrows (*Passer domesticus*), jackdaws (*Corvus monedula*), great tits (*Parus major*) and blackbirds (*Turdus merula*). A recent study investigating the role of infectious disease in the population decline of British house sparrows within Greater London found that *Plasmodium* infection is contributing to this decline, with severely infected birds exhibiting lower rates of overwinter survival.

Pathology

Not all birds infected with *Plasmodium* will suffer disease (i.e. avian malaria). Some birds show no signs of ill health, while others suffer fitness costs (e.g. reduced rates of reproduction) or disease, which can be lethal. *Plasmodium* parasites reproduce in red blood cells, which can destroy the cells and cause anaemia (shortage of red blood cells which transport oxygen around the body). The parasite also reproduces in other tissues, including the liver and spleen, which can lead to enlargement of these organs.

Signs of disease

Birds suffering from avian malaria will typically exhibit non-specific signs of ill-health such as lethargy, lack of appetite, weight loss and a fluffed-up appearance. This makes the disease impossible to diagnose without specialist veterinary examination.

Disease transmission

Plasmodium parasites are transmitted between birds by mosquito bites. In Great Britain, the Northern house mosquito (*Culex pipiens*) is believed to be the primary vector of avian malaria, but it is likely that other species also play a role.

Disease patterns

The *Plasmodium* species associated with a reduction in the British house sparrow population is thought to have been present in Great Britain long before the onset of these declines. It is possible that warmer and wetter weather in recent years has led to an increase in the population of mosquitoes, increasing rates of transmission between susceptible birds. Further research is required to explore the impact of avian malaria on house sparrow populations, and whether adverse population impacts occur in other British wild bird species.

Risk to human and domestic animal health

The *Plasmodium* species reported in birds are distinct from those which cause malaria in humans, so there is no risk of people contracting malaria from infected birds.

However, garden birds in the UK may carry other diseases that can affect humans and pets (for example *Campylobacter*, *Chlamydia psittaci*, *Escherichia albertii* and *Salmonella* bacteria). We recommend following sensible hygiene precautions as a routine measure when feeding garden birds and handling bird feeders and tables. Following these rules will help avoid the risk of any infection transmitting to people and help safeguard the birds in your garden against disease.

- Clean and disinfect feeders/ feeding sites regularly. Suitable disinfectants that can be used include a weak solution of domestic bleach (5% sodium hypochlorite) and other specially-designed commercial products (see *Further information*). Always rinse the feeders thoroughly and air-dry them before re-use.
- Brushes and cleaning equipment for bird feeders, tables and baths should not be used for other purposes and should not be brought into the house but be kept and used outside and away from food preparation areas.
- Wear rubber gloves when cleaning feeders and thoroughly wash hands and forearms afterwards with soap and water, especially before eating or drinking. Avoid handling sick or dead birds directly. For instance, use disposable gloves or pick the bird up through an inverted plastic bag.

The species of *Plasmodium* which infect garden birds are unlikely to be transmissible to domestic poultry, however, the parasite could potentially infect pet passerines (e.g. canaries, finches) and other cage and aviary birds. The risk of *Plasmodium* and other vector-borne infections (e.g. [avian pox virus](#)) spreading to captive birds can be reduced by reducing exposure to mosquitoes and other biting insects where feasible.

Diagnosis

Diagnosis of *Plasmodium* infection and avian malaria requires examination and blood-sampling of live birds, or post-mortem examination. The parasites can be directly visualised in blood or organs under a microscope and further laboratory testing can be used to identify the species and lineage of the parasite.

If you wish to report finding dead garden birds, or signs of disease in garden birds, please visit www.gardenwildlifehealth.org. Alternatively, if you have further queries or have no internet access, please call the **Garden Wildlife Health** vets on **0207 449 6685**.

Control

Whilst treatment can be attempted in captive birds, effective treatment of free-living birds under field conditions is not possible.

Prevention

The true impact of avian malaria on British garden birds remains unknown, so strategies to mitigate its spread in garden birds may be unwarranted. If you are concerned, however, mitigation strategies used in parts of the world where avian malaria is considered a threat to wild birds include:

- Minimising standing water in your garden in the spring and summer. Mosquitoes lay eggs in stagnant water so empty buckets, open water butts, blocked gutters and other containers which fill with rainwater and other debris (e.g. leaves) act as ideal breeding grounds for mosquitoes. By removing these, you may reduce the number of mosquitoes in your garden and subsequently the probability of a mosquito biting an infected bird and spreading *Plasmodium*.
- Removing leaves and regularly changing water in bird baths, paddling pools and other artificial water bodies. Keeping standing water clear of debris removes the food source of mosquito larvae, while changing water frequently will remove eggs and larvae.

- Based on existing evidence, the benefits of garden ponds for wildlife outweigh any potential risks of increasing mosquito-borne *Plasmodium* transmission, so we do not recommend draining or removing ponds.

Further information

[Best feeding practices](#) should be followed at all times to help ensure that the birds visiting your garden remain healthy. More information can be found on the Garden Wildlife Health website www.gardenwildlifehealth.org. The GBHi booklet “Feeding Garden Birds – Best Practice Guidelines” is also available from the GWH team by (email: gwh@zsl.org, telephone: 0207 449 6685).

Scientific publications

Alves, R.O.N., 2012. Avian malaria associations with British mosquitoes. PhD thesis, University of Oxford.

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Dadam, D., Robinson, R.A., Clements, A., Peach, W.J., Bennett, M., Rowcliffe, J.M., Cunningham, A.A., 2019. Avian malaria-mediated population decline of a widespread iconic bird species. *R. Soc. open sci.* 6, 182197.

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