Usutu Virus

Agent

Usutu virus (USUV) is a flavivirus that has recently emerged in Europe where it poses a potential disease threat to both wild and captive birds. It is transmitted between birds (the primary hosts) by mosquitoes. Different strains of the virus have been found in different locations.

Usutu virus was detected in wild Eurasian blackbirds (*Turdus merula*) in Greater London in late summer 2020: this is the first time USUV has been found in Great Britain (GB).

USUV infection in avian species (captive or wild) is not a notifiable disease.

Species affected

Hosts: The primary hosts for USUV are birds. Amongst wild birds there are marked differences in susceptibility between species, with Passeriformes (perching birds), Eurasian blackbirds in particular, and Strigiformes (owls) showing the highest levels of mortality.

In addition to birds, the virus has been known to infect mammals, including bats and humans. These are known as incidental hosts (i.e. infection results from incidental exposure through a mosquito bite but mammals are not part of the virus' normal lifecycle).

Vectors: Whilst USUV has been found in multiple species of mosquito in Africa and mainland Europe, *Culex pipiens* s.l is considered the main vector in Europe and is present in GB.

Signs of disease

In mainland Europe, the most common sign of USUV infection in birds has been mortality events in the summer months, where sometimes large numbers of wild birds (typically blackbirds) and occasionally captive birds (e.g. Great grey owls (*Strix nebulosi*)) have been found dead without prior evidence of ill-health.

On rare occasions where sick blackbirds have been observed, they have shown signs such as lethargy, weakness, loss of coordination and seizures.

Disease transmission

USUV is spread to birds and other animals through being bitten by a virus-carrying mosquito.

Distribution and origin

USUV was first discovered in South Africa in 1959 and was subsequently detected in several countries across Africa. It is suspected that migratory birds played an important role in introducing USUV to mainland Europe from Africa. There are multiple distinct lineages (strains) of USUV and several of these have been detected in Europe, suggesting that the virus has been introduced from Africa on multiple occasions.

The first report of the disease in wild birds in a European country was in Austria in 2001, although retrospective analysis subsequently revealed that the virus has been present in Italy since at least 1996. The virus has since been detected in many additional European countries, including Belgium, Croatia, Czech Republic, France, Germany, Greece,

Hungary, the Netherlands, Serbia, Spain, Sweden and Switzerland. The precise mechanism for virus spread throughout mainland Europe is unknown but it is likely that mosquitoes and migratory birds have played a role in disseminating USUV between countries.

Since its initial detection, USUV appears to have become established (endemic) in some parts of mainland Europe and has been linked to avian mass mortality events, for example in Austria, Germany and the Netherlands, sometimes associated with blackbird population declines. In some areas it is believed that avian populations may be developing immunity to the virus.

A study conducted in GB from 2005-2011 found that all wild birds tested were negative for USUV. Screening of wild bird tissues for flaviviruses has been conducted each subsequent year in GB with samples testing negative until the first detection of USUV in blackbirds in late summer 2020. Whilst USUV was only confirmed in wild birds from a single location in 2020, and it is not possible to conclude on the impact of this outbreak with certainty, analyses of disease surveillance and wild bird monitoring scheme data indicate that further blackbird mortality may have occurred as a result of this virus infection on a scale sufficient to cause a regional decline of this species in 2020 in the Greater London area.

Since USUV has been detected in multiple countries in mainland Europe, this incursion of USUV into GB was considered highly likely to occur, most probably as a result of the movement of mosquitoes or migratory birds.

At present USUV has not been detected in Asia, the Americas or the Australian continent.

Risk to human health

A small number of cases of human infection with USUV, usually neurological disease, have so far been reported in mainland Europe. The virus is presumed to have been transmitted to humans via the bite of an infected mosquito. Current evidence suggests that most USUV infections in humans are asymptomatic (i.e. do not cause disease) and the risk to human health is considered low.

The Human Animal Infections & Risk Surveillance group (HAIRS) has concluded the risk to public health is low. The full risk assessment is available at https://www.gov.uk/government/collections/human-animal-infections-and-risk-surveillance-group-hairs#risk-assessments. According to the Food Standards Agency there is no evidence from Europe that poultry present any risk to public health through the consumption of poultry products.

Standard hygiene precautions, such as not directly handling sick or dead wild birds are recommended as routine. For instance, use disposable gloves or pick a carcass up through an inverted plastic bag if handling is required.

Risk to domestic animal health

USUV is known to cause disease in captive birds, such as those in zoological collections, with Passeriformes (perching birds) and Strigiformes (owls) most susceptible, however a range of species can be affected.

Whilst it has been shown that it is possible to infect domestic chickens under certain experimental conditions, successful onward transmission was not seen; and in those infected, USUV did not cause significant disease in poultry. Exposure to USUV can lead to seroconversion (i.e. antibody production) and in some European countries, poultry are used as a sentinel species for flavivirus infections. Scanning surveillance for new disease threats in poultry and all other farmed species is a year-round activity that the Animal & Plant Health Agency (APHA) undertakes through its network of Veterinary Investigation Centres and associated facilities. The presence of USUV in GB wild birds is not thought to present a risk to GB poultry.

Studies in mainland Europe have detected USUV antibodies in low percentages of sampled horses, dogs, deer and wild boar. USUV has been detected using molecular methods in common pipistrelle (*Pipistrellus pipistrellus*) bats in Germany and Belgium has it has been isolated from rodents in Senegal. These findings suggest that these mammal species are susceptible to infection, however there is currently no evidence of clinical disease caused by USUV in these species.

Diagnosis

Diagnosis cannot be made based on clinical signs (symptoms) of ill health in birds. Post-mortem examination and specialist laboratory testing are required to confirm the presence of the virus.

If you wish to report finding a dead garden bird, 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**.

Further practical guidance is available in our FAQ section https://www.gardenwildlifehealth.org/what-if/

In Great Britain, samples from wild birds submitted to the GWH project for examination during the season when mosquitoes are most active, April - November, are tested for flaviviruses (including USUV) by the APHA.

Prevention and control

At present, no vaccine is available for the prevention of USUV in birds or mammals.

The risk of people contracting USUV infection could be reduced by preventing exposure to mosquitoes (e.g. use of repellent, long sleeves, avoiding being outside at dusk and dawn when mosquito vectors are most active).

There are options for management of mosquitoes if particular species cause nuisance biting and pose a vector risk to humans. Management advice of aquatic habitats for *Culex pipiens* s.l. and *Culiseta annulata* control around the home and in urban areas can be found here:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/577340/Mosquito_control_factsheet.pdf

Scientific publications

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