GB Wildlife Disease Surveillance Partnership quarterly report
Disease surveillance and emerging threats
Volume 23: Q4 – October-December 2018

Highlights

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<td>No highly pathogenic avian influenza virus (HPAIV) isolated this Autumn,</td>
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<td>the last case was in April 2018, in a Eurasian buzzard (Buteo buteo) found in Suffolk</td>
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<td>Two Serotine bats (Eptesicus serotinus) from Dorset were positive for EBLV</td>
<td>8 &amp; 18</td>
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<td>1 representing the first time this strain of EBLV has been detected in the UK</td>
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<td>The first cases of Rabbit Haemorrhagic Disease-2 (RHDV-2) involving three</td>
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<td>European brown hare (Lepus europaeus) were confirmed in Dorset and Essex.</td>
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Introduction and overview

The GB Wildlife Disease Surveillance Partnership comprising the Animal and Plant Health Agency (APHA), SRUC Veterinary Services, Institute of Zoology (IoZ), the Centre for Environment, Fisheries and Aquaculture (CEFAS), the Wildfowl and Wetlands Trust (WWT), Natural England (NE), the Forestry Commission England (FCE) and the Garden Wildlife Health (GWH) project produces the GB Wildlife Disease Surveillance Partnership Quarterly Reports:


Issues and trends

This autumn the APHA has been involved in investigating a possible increased mortality in European brown hare. European brown hare syndrome (EBHS) virus has been the main cause of these deaths but mortality rates are far less than the EBHS epidemic years of 1989-1990. There have been no recorded cases of highly pathogenic avian influenza (HPAIV) since April 2018.

APHA Diseases of Wildlife Scheme (DoWS)

Notifiable diseases

Avian Influenza (AI) Virus

Great Britain AI Wild Bird Surveillance (AIWBS):
October-December 2018

Total wild bird surveillance

During the fourth quarter of 2018 there were fewer reports of wild bird mortality events and fewer birds tested under the scheme. No samples tested positive for highly pathogenic avian influenza. Six birds tested positive for influenza A screening, but on further characterisation all were negative for the H5 subtype. The last positive finding of highly pathogenic avian influenza was in April 2018, a Eurasian buzzard (Buteo buteo) found in Suffolk.

The threshold criteria for collections and submissions of wild birds found dead for the purposes of AI surveillance remains at three or more waterfowl target species –
specifically wild geese, wild ducks, swans, and gulls found in the same location; and of one or more for birds of prey, and five or more of any species, found in the same location (mass mortality event).

Number of wild birds tested and results in GB – 4th Quarter

<table>
<thead>
<tr>
<th>Surveillance activity</th>
<th>Number of birds tested*</th>
<th>Positive AI virus result and species of bird</th>
<th>Comments</th>
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<tr>
<td>Found dead/injured</td>
<td>152 (256)</td>
<td>All Influenza A positive, but not highly pathogenic strains: One Mallard Duck (<em>Anas platyrhynchos</em>) in Yorkshire (October); Three (wild) Domestic Geese (<em>Anser anser</em>) in Norfolk (November); One Whooper swan (<em>Cygnus cygnus</em>) in Lancashire (November); One Mute Swan (<em>Cygnus olor</em>) in Yorkshire (December)</td>
<td>Scanning surveillance All-year-round</td>
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*Number of birds tested: figure may be slightly different from other reports due to exact query run on dataset. Figures for October - December 2017 are shown in brackets. Data query used for this report is the date of ‘M gene approval’.

Members of the public are asked to remain vigilant and report findings of target species in addition to mass mortality incidents to the Defra Helpline: 03459 33 55 77.

Warden Patrol Scheme

The main emphasis is on AIWBS in found dead wild birds, including mass mortality incidents, and patrols of designated reserves by skilled wild bird ecologists and wardens. These Warden Patrols continue year-round, but are also seasonally targeted in the winter and spring periods (October to March) each year.

During the period 1st October – 31st December (Q4 2018), a total of 513 Warden Patrols were performed at sites across GB. This compares with a total of 471 Warden Patrols performed during the same period in 2017 (Q4-2017) in GB. During Q4-2018, the Warden Patrols were mainly performed by Natural England and the Wildfowl and Wetlands Trust. In total during Q4-2018, 70 wild birds found dead were tested, with no HPAI detections. This compares with a total of 75 wild birds found dead and tested during the same period of 2017.

In Q4-2018, Whooper Swans were the most common target species found, and birds were most commonly found in the East region of England, with none submitted from the Midlands. This was the same for Q4-2017.
Current EU situation

The European HPAI picture in this quarter was relatively quiet, compared to the same quarters in the previous two years. That said, pockets of H5N8 HPAI still remained in the commercial sector in Bulgaria, and there have been scant cases of H5N6 in birds of prey (White-tailed eagle [Haliaeetus albicilla] and a buzzard [Buteo buteo]) in Denmark, indicating continued low-level circulation of H5N6 in wild birds around the Baltic region. The risk to the UK remained at LOW.

APHA, in collaboration with Defra, monitors the international situation and distribution of avian influenza detections:


Current UK Situation

There were no outbreaks of HPAI of any kind in commercial or captive poultry or birds in the UK in 2018. In wild birds, the last HPAI reported was H5N6 in a buzzard found in April 2018. The OIE/FAO international reference laboratory/UK national laboratory at APHA Weybridge has the necessary ongoing diagnostic capability to investigated and report on both LPAI and HPAI virus strains in wild birds and commercial poultry.

To report the suspicion of notifiable diseases in animals:

- In England – call the Defra Rural Services Helpline on 03000 200 301. The Helpline is open Monday to Friday, 8.30am to 5pm and there is an out-of-hours facility on the same number for reporting suspicion of disease in animals.
- In Scotland and Wales, contact your local APHA Field Services Office: https://www.gov.uk/government/organisations/animal-and-plant-health-agency/about/access-and-opening.

Further information regarding avian influenza in poultry and wild birds is also available:

- When and how to register your poultry flock, and which species must be registered in Great Britain: https://www.gov.uk/guidance/poultry-registration.
- Information about the chargeable testing scheme offered in GB by APHA that enables veterinarians to request ‘Testing for Exclusion of notifiable avian disease’ in chicken and turkey flocks, in circumstances that would not require the implementation of statutory disease control measures (Gibbens and others, 2014):

Avian influenza and Newcastle disease/PPMV-1 events, including H5 HPAI internationally, are also summarised in GB Wildlife Disease Surveillance Partnership quarterly reports.

References

Summary: Threats - HPAIV, targeted active surveillance of wetland birds

As part of its involvement in the GB AIWBS, WWT continued to monitor avian influenza in dead wild birds during the last quarter of 2018. Between October and December a total of 91 dead wild birds were found, of which 69 were sampled for avian influenza. Sampled dead birds originated from eight WWT reserves across the UK, located in Gloucestershire, Carmarthenshire, West Sussex, Greater London, Norfolk, Lancashire, Tyne and Wear, and Dumfries and Galloway.

The discrepancy between the total number of dead birds found and the number sampled is largely attributable to a high mortality event over a small number of days at a WWT reserve in Norfolk (see ‘Passive surveillance of waterbirds’ section below for more details). Only a portion of these birds were sampled for avian influenza, as some carcasses were heavily predated or unable to be recovered.

Of the dead birds which were sampled, 20 species were of surveillance priority. These included swans, geese, ducks, gulls, rails, as well as a northern lapwing (Vanellus vanellus), a common buzzard (Buteo buteo), a Eurasian sparrowhawk (Accipiter nisus), and a Northern goshawk (Accipiter gentilis). Two non-priority species, a Eurasian crane (Grus grus) and an Egyptian goose (Alopochen aegyptiaca), were also sampled.
All samples tested negative for highly pathogenic avian influenza (HPAI) viruses. Samples from one individual whooper swan (Cygnus cygnus) found in October 2018 at a WWT reserve in Lancashire tested non-negative for low-pathogenic, non-H5 avian influenza virus. See APHA report for further details of HPAI surveillance results from across the UK.

WWT

Zoonotic diseases

APHA Diseases of Wildlife Scheme (DoWS); Salmonellosis in wildlife; October-December 2018

Threat: Zoonotic, farmed and pet animal risk

There is no routine monitoring of Salmonella in wild birds or wild mammals. Therefore, all isolates are usually from clinical cases, although Salmonella may often not be the primary cause of disease. Occasionally it is isolated from small-scale surveys.

Salmonella Enteritidis PT11 was isolated from diarrhoeic faecal samples of two juvenile hedgehogs (Erinaceus europaeus) at a hedgehog rescue centre. Last year this centre had a problem with Cryptosporidium parvum and with Salmonella Enteritidis PT11 the previous year. This might reflect infection in local populations rather than carry over at the centre. The usual S. Enteritidis phage type in hedgehogs is phage type 11, which is common and widespread in hedgehogs in England (Keymer and others, 1991). Robinson & Routh (1999) suggest that S. Enteriditis phage type 11 appears to be endemic in hedgehogs.

Bird variant S. Typhimurium DT40 was confirmed, from an isolate submitted by a private veterinary laboratory, in a faecal sample from an adult Holstein Friesian cow. No further history was given. There were no reports of bird variant S. Typhimurium DT56 or DT56v from domestic species.

APHA Salmonella reports for 2018

Salmonella Typhimurium DT12a was isolated from a juvenile male hedgehog (Erinaceus europaeus) in a wildlife hospital. This isolate was resistant in vitro to tetracycline but widely sensitive to other antibiotics. APHA’s “Salmonella in livestock production in Great Britain” publication for 2016, gives three cases of S. Typhimurium DT12 in cattle in 2016 but none in the four previous years. DT12 includes a number of diverse genotypes with a MDR variant being linked with S. Typhimurium DT104. A swab was submitted from a private laboratory from a one year-old hedgehog. No other information was given. A widely antibiotic sensitive S. Livingstone was isolated. The “Salmonella in Livestock Production in Great Britain during 2016” reports that chickens in 11 poultry flocks were infected with S. Livingstone. This isolate is usually associated with contaminated hatchery equipment. It
was not isolated from other farmed animal species. An untypeable S. Enteritidis was isolated from an immature hedgehog from another site. This isolate was resistant in vitro to ampicillin, sulphonamides, tetracycline, and trimethoprim/sulphamethoxazole. *Salmonella Enteritidis* PT11 was isolated from diarrhoeic faecal samples of two juvenile hedgehogs at a hedgehog rescue centre. Last year this centre had a problem with *Cryptosporidium parvum* and with *Salmonella Enteritidis* PT11 the previous year. This might reflect infection in local populations rather than carry over at the centre. *S. Enteritidis* phage type phage type 11 is the commonest *Salmonella* spp. isolated from hedgehogs, it is common and widespread in hedgehogs in England (Keymer and others, 1991). Robinson & Routh (1999) suggest that *S. Enteriditis* phage type 11 appears to be endemic in hedgehogs.

*S. Kedougou* was isolated by a private laboratory from swab from a feral ferret (*Mustela putorius furo*) in the West Country. No further details were given. The 2016 *Salmonella* publication reports that during 2016 the most commonly reported serovars from animal feedstuffs and compound feed were *S. Kedougou* and *S. Senftenberg* with 29 isolations each.

Bird variant *S. Typhimurium* DT40 was isolated from pheasant chicks (*Phasianus colchicus*) on three game farms in England during June. Two of these groups of chicks were seven day-old and the other 16 days-old. No clinical histories were given. Bird variant *S. Typhimurium* DT40 was isolated from the caecal contents of a ten day-old pheasant chick on a game farm in England during July. Again no clinical history was given. Bird variant *S. Typhimurium* DT40 was confirmed, from an isolate submitted by a private veterinary laboratory, in a faecal sample from an adult Holstein Friesian cow. No further history was given. There were no reports of bird variant *S. Typhimurium* DT56 or DT56v from domestic species.

Significant chick losses were reported in a 300 nest breeding colony of lesser black backed gulls (*Larus fuscus*), following bad weather with high tides and strong winds on the Solway Firth, Cumbria. 19 chicks were found dead and about 70 chicks remain. A batch of eight dead chicks were submitted initially for AIV screening but no other testing was possible due to advanced autolysis. A further two fresher chicks, with an estimated age of four weeks, were examined and these were in poor bodily condition. Also there was evidence of dehydration possibly due to current hot weather. There was no evidence of traumatic injury. A widely antibiotic sensitive *S. Mbandaka* was isolated on direct culture from the intestinal contents of one of these birds, indicating possible disease causing significance, contributing to the poor body condition of the gull. *S. Mbandaka* is occasionally isolated from cattle and cattle feedstuffs. In this case, it is tempting to speculate that the gulls may have become infected through feeding around cattle farms. Thus it was suggested that fresh faecal samples from the gull colony would be useful to determine if infection was widespread. Advice regarding the zoonotic potential of this isolate was also given.

There were no reports of bird variant *S. Typhimurium* DT56 or DT56v from domestic species.
References


Quality statement regarding these data: - UK data and the output of ad-hoc data retrieval from APHA FarmFile database. These figures are provisional. Research project and routine game bird isolates were excluded. All are from England and Wales.

Alex Barlow, APHA Diseases of Wildlife Scheme

IoZ Passerine salmonellosis

- Summary including possible threats – Point for Information (PFI);
- Threat to Passeriform health and welfare;
- Potential threat to human and domestic animal health

Passerine salmonellosis, caused by Salmonella enterica serovar Typhimurium, has historically affected gregarious, seed-eating Passeriformes, such as greenfinch (Carduelis chloris) and house sparrow (Passer domesticus), most often during the winter months and in the vicinity of garden feeding stations (Lawson and others, 2018). However, the number of confirmed disease incidents has reduced markedly over the past decade and in February 2018 we diagnosed a single case of passerine salmonellosis in a siskin (Spinus spinus), found dead at a site in Scotland. Please refer to our Q1 report and to the paper by Lawson and others (2018) for further information.

We continue to alert members of the public to the potential risk of zoonotic Salmonella infection from direct or indirect contact with wild birds, and routinely advise on basic hygiene precautions, such as hand washing after feeding wild birds.

References


‘Salmonellosis in Garden Birds’ factsheet: https://www.gardenwildlifehealth.org/portfolio/salmonellosis-in-garden-birds
Report from Wildlife Zoonoses and Vector Borne Disease Research Group; 4th Quarter; October-December 2018

Summary - threat: Zoonotic, farmed, pet animal and international trade risk

Passive surveillance for lyssaviruses in UK bats

Eighty three bats were tested for lyssavirus under passive surveillance. Eighty bats were negative whilst 1 Daubenton’s bat (*Myotis daubentonii*) from Scotland was positive for European Bat Lyssavirus 2 (EBLV2) and two Serotine bats (*Eptesicus serotinus*) from Dorset were positive for EBLV1 representing the first time this strain of EBLV has been detected in the UK.

Five zoo bats were tested in this quarter for lyssaviruses. All were negative.

Rabies diagnosis

Four dogs that died in quarantine were tested for rabies. All were negative.

Two suspected human cases were tested for rabies in this quarter. One was negative whilst the second was positive. The patient had acquired the infection through the bite of a cat whilst travelling in Morocco and had unfortunately died in hospital.

Rabies surveillance in terrestrial wildlife

Vigilance continues for this notifiable disease in UK wildlife but no samples from terrestrial wildlife were submitted for testing this quarter.

WNV surveillance in wild birds SV3045

Brain and kidney tissue from 187 wild birds received from APHA VICs, SRUAC, PBMS (Predatory Bird Monitoring Scheme) and ZSL representing 26 identified species of small passeresines, corvids, raptors and water birds as well as unidentified species were tested by TaqMan PCR for WNV during this period with negative results.

Usutu virus surveillance in wild birds SV3045

Brain and kidney tissue from 2 Blackbirds (*Turdus merula*), 50 Barn Owls (*Tyto alba*), 11 Tawny Owls (*Strix aluco*) and 2 Little Owls (*Athene noctua*), were tested for Usutu virus during this period by TaqMan PCR with negative results.

West Nile virus surveillance in Equids
Two serum samples from horses exhibiting neurological signs were tested for WNV by cELISA (detects both IgM and IgG) during this period with negative results.

**International Trade testing - pigeons**

One hundred and forty-two pigeons from various countries that were quarantined in the UK prior to export to Australia were tested by WNV cELISA for health certification purposes. Two were positive.

*Paul Phipps, Wildlife Zoonoses and Vector Borne Disease Research Group, APHA Weybridge*

**IoZ Usutu virus surveillance**

- Summary including possible threats – Point of information
- Horizon scanning for Usutu virus (USUV); potential threat to blackbird and owl health and biodiversity if USUV becomes established in wild birds in GB

Brain and kidney samples from 86 garden birds of 30 species (including blackbirds), examined between April and November 2018, inclusive, were submitted to APHA laboratories for West Nile virus and USUV (where indicated by species, clinical history or post-mortem findings) PCR testing; all samples have tested negative to date.

Usutu virus has been detected in multiple countries in mainland Europe since 2001, most recently the Netherlands in 2016 (Rijks and others, 2016). As blackbirds are the wild bird species most frequently involved in multiple mortality incidents caused by USUV, horizon scanning, and investigation of the aetiology of blackbird mortality reports remains a high priority for early detection in the event of viral incursion to GB.

Forty-six DIRs (Disease Incident Reports) involving 22 sick and 28 dead blackbirds (*Turdus merula*) from 37 sites from England and Wales were received in 2018. Post-mortem examinations were performed on five blackbirds, submitted from five sites in England.

**Reference**


*IoZ*
Ongoing new and re-emerging diseases, unusual diagnoses and horizon scanning

Wildlife Diseases, horizon scanning; points for interest and threats associated with wildlife and wildlife disease

- Phylogenetic analysis of 2016–17 HPAI viruses indicates 2 main pathways into Europe. Highlights the need for global surveillance of viral changes to inform disease preparedness, detection, and control.


- In road-killed badgers collected in 2014, *Mycobacterium bovis* was isolated from 21% (20/94) badger carcases.


- Research findings show that loss of honeybee colony size is the best indicator of reduced ecoservice.


- Results suggest that pigs are likely to be the original source of *Salmonella* infection in wild birds. Wild birds are likely recycling and contributing to the persistence of *Salmonella*.

- Over 1200 harbour and grey seals have been found dead or stranded in New England, USA between 1 of July 2018 and the 10 of October 2018. The main pathogen involved is thought to be phocine distemper virus. Suggestion that immunosuppression due to PCBs or other pollutants may be playing a role as well.

References:


- White-clawed crayfish tested positive for crayfish plague in Blackwater, Northern Ireland and the River Shannon, Ireland.

References:
Pro-MED-mail. Crayfish plague – UK (Northern Ireland) White-clawed crayfish OIE. ProMED-mail 2018; 17 Oct: 20181017.6095390.

Pro-MED-mail. Crayfish plague – Ireland (Westmeath) White-clawed crayfish. ProMED-mail 2018; 15 Nov: 20181115.6147679.

- Myxomatosis reported in a hare in Portugal.

Reference: ProMED-mail. Myxomatosis – Portugal (02): (Evora) hare, OIE. ProMED-mail 2018. 15 Nov: 20181115.6147632.

- Investigation into the occurrence of zoonotic enteric bacteria in seabirds across the Antarctic and subantarctic region suggests reverse zoonosis occurring.

Reference: ProMED-mail. Reverse zoonotic disease transmission, sea birds – Antarctica. ProMED-mail 2018. 14 Dec: 20181214.6209481.
Mammal reports

Wild mammal reports from Scotland

Cherry poisoning was diagnosed in a fox (*Vulpes vulpes*) found dead in Motherwell by a member of the public who had seen several other dead foxes nearby, and contacted the police due to concern for local dogs. The fox was a young adult male in good condition, and showed epistaxis, a green leaf in the oral cavity, blood tinged pleural and pericardial effusion and bloody mucus in the trachea and airways. The lungs and liver were pale, and the liver friable. The stomach was distended by dark purple round fruit approximately 2 cm in diameter with a central hard kernel. Many more hard kernels were present in the intestines. The reporter indicated that the local foxes were fed dog food in an area with about an acre of cherry trees, but both this practice and the cherry trees had been in situ over a period of years with no prior issues.

It was suspected that the foxes had changed their feeding habits during the hot weather (the death occurred at the end of July), seeing the cherries as an appetizing source of calories and moisture. A very low residue of difenacoum, insufficient to have contributed to the death, was also found. The lethal dose of cherry stone in rats is 3g/kg bodyweight. Two cherry stones weight approx. 1g, and the fox weighed 7kg, so the lethal dose was estimated at around 42 stones. The fox had consumed more than double this number, with stones present throughout the gastrointestinal tract.

This case is of interest due to the alarm caused to a member of the public, and due to the suspicion that the foxes had changed their behaviour due to the unusually hot weather – a circumstance which may become more frequent due to climate change.

Reference
Personal communication, Professor Hal Thomson, formerly of Glasgow University Veterinary School.

Caroline Robinson, SRUC Veterinary Services

Wild mammal reports from IoZ

Herpesvirus infection on Western European hedgehogs (*Erinaceus europaeus*) in Great Britain
- Summary including possible threats – Point for Information (PFI);
- Concern for free-living European hedgehog health and welfare

As reported for Q3, a recent study (Hydeskov and others, 2018) conducted at the IoZ detected the presence of herpesvirus infections in British hedgehogs. Sequence analysis revealed at least two novel viruses within the *Gammaherpesvirinae* in British
hedgehogs, alongside two genetically distinct Human alphaherpesvirus 1 viruses, identified from previously published cases of fatal herpesvirus disease in two captive hedgehogs from Switzerland and from Sweden. The clinical significance of gammaherpesvirus infections in British hedgehogs is currently unknown, and no evidence of associated disease has been confirmed to date. However, the identification of Human alphaherpesvirus 1 in hedgehogs held in captivity in mainland Europe highlights a potential risk for anthropo notic infection. A disease factsheet on ‘Hedgehog Herpesvirus infection’ is now available on the GWH website to raise awareness and understanding for members of the public and those involved in hedgehog rehabilitation.

References
‘Herpesvirus in Hedgehogs’ factsheet: https://www.gardenwildlifehealth.org/portfolio/herpesviruses-in-hedgehogs/

Hydeskov and others, 2019: Listeria monocytogenes infection of free-living Western European Hedgehogs
- Summary including possible threats – Point for Information (PFI);
- Concern for free-living European hedgehog health and welfare

Listeria monocytogenes, a ubiquitous environmental bacterium, is most frequently detected as causing disease in ruminant livestock, but is also known to infect people and occasionally wildlife. Post mortem examinations of British hedgehogs (2011–2017) identified L. monocytogenes infection in five (5/266, 2%, 95% confidence interval: 0.8–4.3%) animals. Whilst the bacterium was isolated from extra-intestinal sites in multiple hedgehogs, which may indicate septicaemia, histological examination was limited and could not discriminate subclinical infection from disease (i.e., listeriosis): as such, the clinical significance of infection in hedgehogs is unknown. On molecular characterisation, the L. monocytogenes isolates were found to be distinct and epidemiologically unrelated. It therefore appears that infection is acquired sporadically from the environment, possibly through the ingestion of soil dwelling invertebrates. Despite being a zoonosis, L. monocytogenes infection in people typically occurs following the ingestion of contaminated foods, and the risk of immunocompetent people being infected via contact with hedgehogs is considered very low to negligible.

Reference
Wild mammal reports from APHA DoWS

European brown hares (*Lepus europaeus*) examined autumn 2018

Summary including possible threats – Awareness, Alert and Point for information. Biodiversity threat (threatened species not identified) Public concern and press reporting

Widespread reports of dead and dying brown hares were received this autumn. Seasonal mortality in hares, due to a variety of diseases, during the autumn months, is considered a regular occurrence in this species, particularly following a successful breeding season when populations may be high and exceed the healthy carrying capacity of the habitat. Hares can be prolific breeders and in a good breeding year they may become pregnant as early as February with females producing three or even four litters of three or more leverets a year until September, this can result in very elevated autumn population densities. Incident mortalities this autumn have usually been in the order of 2-4 animals found dead, however, during the EBHS (European brown hare syndrome) epidemic years (1989-1990), the Wildlife Disease surveillance scheme at the time reported an average of 28 carcases per incident in 15 incidents (Duff et al, 1994; Duff et al 1997) and it is therefore not clear at present whether the mortality this year is in fact significantly higher than normal. Provisional results from 14 incidents submitted to the APHA Diseases of Wildlife Scheme (DoWS) have indicated that EBHS is again the primary cause of death, being diagnosed in 6 of the 14 incidents. Two mortality incidents of Rabbit Haemorrhagic Disease-2 (RHDV-2) involving three hares were confirmed in Dorset and Essex. The Essex case was diagnosed by a private laboratory. These were the first recorded cases in Great Britain (GB) (Bell et al, 2019).

Other causes of mortality have included coccidiosis and traumatic injury. No cases of myxomatosis have yet been diagnosed, although there have been anecdotal reports in the past, only one case has as ever been confirmed in GB (Barlow et al 2014). Examinations are still in progress and a summary will be given when these are completed however, results thus far suggest that the mortalities were due to several diseases and that no single disease predominated i.e. no single disease was a driver for the mortality.

References


**APHA DoWS**

*Actinobacillus capsulatus* cultured from brown hare (*Lepus europaeus*)
- Summary including possible threats – Point for Information (PFI)
- Concern for free-living brown hare health and welfare

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*A European brown hare (*Lepus europaeus*) was submitted for post mortem examination from Kendal, Cumbria. On post mortem examination, the hare was in poor condition, the carcase had been predated and there were multiple puncture wounds, some associated with fresh blood. The caecum was filled with a blood clot and the spleen was noticeably enlarged and very congested. Although the cause of death was thought to be due to traumatic injury likely caused by a predator, healthy hares are usually difficult to catch so testing for concurrent disease was initiated. A worm egg count was unremarkable. Virology was negative for both Myxamatosis and RHD. However, *Actinobacillus capsulatus* was isolated in heavy, but mixed growth from the spleen. Given the splenic enlargement and congestion, this is suggestive that this infection may have been an opportunist but probably terminal cause of septicaemia. Histopathology confirmed a severe systemic bacterial infection with changes noted in the liver and spleen and Gram staining revealed the involvement of a gram...*
negative bacteria, consistent with *Actinobacillus* species. *Actinobacillus capsulatus* has been isolated from hares and rabbits previously but based on the literature it has not been previously reported in the UK in these species.

**References**


**APHA DoWS**

*Arcanobacterium phocisimile* isolated from common seal abscess

- Summary including possible threats – Point for Information (PFI)
- Concern for free-living common seal health and welfare

A swab from an abscess was submitted from a two to three month old male common seal (**Phoca vitulina**) pup. The seal had been rescued from the Norfolk coast because it was underweight, lethargic and had a swollen neck. It was taken to RSPCA wildlife hospital at East Winch where treatment was started but it died twenty hours after admission. Post mortem examination revealed extensive abscessation and cellulitis of the subcutis affecting the neck and flank. There was also pyogranulomatous inflammation and some fibrosis around the upper oesophagus. It was suspected there had probably originally been an oesophageal penetrating injury leading to subsequent infection. A light pure growth of *Arcanobacterium phocisimile* was isolated from a swab sent to APHA Bury St Edmunds VIC.

Extensive abscessation affecting large areas of the subcutis is not uncommon in recently-weaned common seal pups. Microbes cultured from these lesions are usually gram positives (commonly *Streptococcus phocae*, *Streptococcus canis* or *Arcanobacterium phocae*). These are probably opportunistic pathogens but importantly seem capable of tracking widely along tissue planes in these animals.

This is the first time APHA has cultured *Arcanobacterium phocisimile*. The organism was first described as a novel organism in 2013 when it was isolated from a vaginal swab and
an anal swab taken from two seals during a monitoring programme of free-living harbour seals of the German North Sea (Hijazin et al., 2013). Further reports in the same region were made in 2014 where three further isolates were identified in mixed growth from two apparently healthy and one dead harbour seals (Sammra et al., 2014). The significance of this organism as a pathogen is unknown.

References


Steve Bexton RSPCA and Cornelia Bidewell APHA Bury St Edmunds

Pyelonephritis in grey seal (Halichoerus grypus) pup
- Summary including possible threats – Point for awareness, interesting case
- Unlikely to be a biodiversity threat

A male grey seal (Halichoerus grypus) pup was picked up in west Cornwall in a hypothermic and partially responsive state. The pup began convulsing after receiving oral fluids and, as it failed to respond to warming and intravenous glucose, it was euthanased. On post mortem examination, the pup was found to have pyelonephritis (Figure 4), most likely secondary to an ascending infection of the urinary tract. E. coli, isolated in pure growth from kidney, was likely to have been the causative pathogen. The pup was also suffering from severe hepatic lipidosis (Figure 3), the aetiology of which was not absolutely clear but
excessive fat mobilisation due to a period of anorexia secondary to pyelonephritis and toxaemia secondary to \textit{E. coli} infection may well have been implicated.

James Barnett MRCVS, University of Exeter and APHA DoWS

**EBLV1 detected in serotine bat**

- **Summary including possible threats – Point for Information (PFI), first detection of viral strain in the UK, zoonotic disease, public concern and press reporting**

European Bat Lyssavirus 1 (EBLV1) was detected in two serotine bats (\textit{Eptesicus serotinus}) that were found dead in Dorset. They were tested by the APHA as part of the passive surveillance scheme for bat lyssavirus. This is the first time that the presence of EBLV1 virus has been confirmed in bats in the UK. Previously European Bat Lyssavirus 2 (EBLV2) has been detected but positive animals have always been Daubenton’s bat (\textit{Myotis daubentoni}).

APHA DoWS

**Avian Reports**

**Wild Bird report from the IoZ**

**Finch trichomonosis**

- **Summary including possible threats – Alert;**
- **Biodiversity threat to British populations of greenfinch with continued significant population decline, animal welfare, cause of considerable public concern**

Trichomonosis, an emerging infectious disease first recognised in GB in 2005, remains the most frequently diagnosed infectious cause of death in garden birds examined at the IoZ, accounting for 53% of diagnoses reached for wild bird PMEs in 2018 (77/146 birds). \textit{Fringillidae} remain the family in which this disease is most often diagnosed: 37 chaffinches (\textit{Fringilla coelebs}) from 27 sites; 15 greenfinches (\textit{Chloris chloris}) from 13 sites; eight bullfinches (\textit{Pyrrhula pyrrhula}) from seven sites; seven goldfinches (\textit{Carduelis carduelis}) from seven sites; two hawfinches (\textit{Coccothraustes coccothraustes}) from two sites; and one Brambling (\textit{Fringilla montifringilla}). Trichomonosis was also diagnosed in six collared doves (\textit{Streptopelia decaocto}) from separate sites, and one dunnock (\textit{Prunella modularis}). In addition to diagnoses reached at PME, 21% (337/1617) of all wild bird DIRs were assigned a suspected diagnosis of finch trichomonosis, based on the species and clinical signs observed, involving 397 sick and 350 dead birds from 189 sites from England, Scotland and Wales.

Finch trichomonosis has resulted in ongoing epidemic mortality of British greenfinches, and a population decline of approximately 59% over the last decade (Woodward and
others, 2018): the extent of the decline is such that the recent BirdTrends 2018 report noted that re-listing of the greenfinch conservation status from 'Green' to 'Red' is likely when the next Birds of Conservation Concern review is conducted (Woodward and others, 2018). Furthermore, the impact of trichomonosis on greenfinches represents the largest disease-mediated population decline of a wild bird species in GB to date, and highlights the need for continued investigation, as well as the provision of evidence-based mitigation advice for members of the public to minimise the risks of disease transmission at supplementary feeding stations.

Reference


Psittacine Beak and Feather Disease (PBFD)
- Summary including possible threats – Point for Information (PFI);
- Threat to free-living ring-necked parakeet (Psittacula krameri) health and welfare;
- Potential threat to captive Psittaccine health

Psittacine beak and feather disease is a well-known cause of mortality of captive and wild psittacines around the world. A small number of PBFD cases, resulting from infection with Beak and Feather Disease Virus (BFDV), have been confirmed in free-living ring-necked parakeets (Psittacula krameri) from Greater London since 2013 (Sa and others, 2014), including a single case in February 2018. Please refer to Q1 for further information.

Reference


Finch leg lesions – update
- Summary including possible threats – Point for Information (PFI);
- Threat to bird welfare and cause of public concern

Chaffinches are the wild bird species most frequently affected by proliferative leg skin lesions, which have been known to occur in GB and mainland Europe for decades. A recent study found that finch leg lesions are caused by either Fringilla coelebs papillomavirus or Cnemidocoptes sp. mites and that co-infections commonly occur (Lawson and others, 2018). Chaffinches with leg lesions are frequently reported across
GB, throughout the calendar year, however there is a clear seasonal peak from November to March, which coincides with the period when chaffinches from mainland Europe, particularly Scandinavia, overwinter in GB.

In 2018, a syndromic diagnosis of ‘finch leg lesions’ was assigned to 396 DIRs involving 579 sick and 10 dead wild birds from 202 sites from England, Scotland, Wales and Northern Ireland. This represents the most frequently assigned incident definition for reports regarding wild birds, accounting for 24% of avian DIRs.

Reference


IoZ

Wildfowl and Wetlands Trust (WWT) report: September–December 2018

Passive surveillance of waterbirds

Post mortem examinations were performed on 41 wild birds which were found dead during this quarter. These comprised 16 species across six WWT sites (Slimbridge, Gloucestershire; Arundel, West Sussex; Llanelli, Camarthenshire; Martin Mere, Lancashire; Washington, Tyne and Wear). The following species were examined: mute swan *Cygnus olor* (4), whooper swan *C. cygnus* (19), greylag goose *Anser anser* (2), Canada goose *Branta canadensis* (1), pink-footed goose *Anser brachyrhynchos* (2), common shelduck *Tadorna tadorna* (2), common teal *Anas crecca* (1), mallard *Anas platyrhynchos* (1), common pochard *Aythya ferina* (1), black-headed gull *Chroicocephalus ridibundus* (2), lesser black-backed gull *Larus fuscus* (1), common gull *Larus canus* (1), coot *Fulica atra* (1), Eurasian crane (1), sparrowhawk (1) and buzzard (1).

The most notable finding of the quarter was the mass mortality events of whoopers swans which were recorded on or between the 23rd and 27th November with 14 and then 16 birds dying as a result of powerline collisions. Although collisions of large birds with powerlines is not uncommon (e.g. Kelly and Kelly 2005, Frost 2008) the scale of these events is unusual. At this time of year these migratory swans are usually flying in large or small groups to and from roosting and feeding areas and the presence of hard infrastructure on frequently used flight lines poses a particular hazard. Inclusion of high visibility diverters on wires in high risk areas is encouraged to avoid both mortality and also damage to power company property and problems with electricity supply (Frost 2008).
Amongst other typical causes of death were four cases of lead poisoning (1 x whooper swan, 1 x mute swan and 2 x greylag goose) caused by ingestion of lead shot. The case of the whooper swan from WWT Welney in Norfolk is highlighted due to its impacted gizzard containing 43 lead pellets (which killed it) and 5 non-toxic steel pellets (which did not) (Figure 5). Other than highlighting the density of shot in the environment and the predilection for shot shown by wildfowl, the non-toxic shot are probably indicative of a wildfowler complying with the law, and the lead shot likely indicate continued non-compliance with the law (Cromie et al. 2015), unless the bird had been feeding in agricultural fields where lead was being used legally for terrestrial shooting.

References


WWT

Sarcocystis surveillance project
Passive surveillance of the parasite Sarcocystis rileyi in UK wildfowl using data submitted by the hunting community continued throughout this quarter. Between October and December 2018 a total of 32 reports of rice-breast disease were submitted to the
Sarcocystis Survey website. These comprised six species of harvestable wildfowl, namely mallard *Anas platyrhynchos* (12), Eurasian teal *Anas crecca* (8), Eurasian wigeon *Mareca penelope* (8), Northern pintail *Anas acuta* (2), gadwall *Anas strepera* (1), and Northern shoveler *Anas clypeata* (1). The submissions from this quarter bring the total number of reports for this first part of the season to 39 (September–December) (similar to 2017), with more expected before the end of the wildfowl hunting season in January 2019.

**WWT**

**Wild bird reports from Scotland**

Brodifacoum rodenticide poisoning was diagnosed in a red kite (*Milvus milvus*) found dead in the Yorkshire Dales and the carcass was submitted to SRUC Veterinary Services. At necropsy, subcutaneous and intramuscular haemorrhages were found over the skull, breast muscles, and right thigh, the heart was encased in a large blood clot, and there was extensive haemorrhage throughout the lungs. A single small, metal ball with the appearance of a shot gun pellet was found embedded in the left thigh, but there was no associated recent injury or haemorrhage, and with regards to the death this was likely to be an incidental and historical finding. Toxicology revealed residues of two anticoagulant rodenticides, brodifacoum and difenacoum, with the residue of brodifacoum alone at a level was considered likely to be responsible for the death of the bird (0.314 mg/kg Brodifacoum). Red kites are scavengers and it is likely that exposure to the rodenticide was accidental, by consumption of a rodent or rodents poisoned legally by Brodifacoum. These cases can cause alarm in the public by raising suspicions of intentional raptor persecution in the area.

Colisepticaemia was diagnosed in an adult male brambling (*Fringilla montifringilla*) which was found dead in a garden. Body condition was normal, and the only finding of note was congestion and some consolidation of the ventral aspect of the left lung. A profuse growth of *Escherichia coli* was isolated from the heart, liver and lung. *E. coli* infections are a common cause of death in garden passerines and subsequent alarm to householders, who often suspect poisoning. Advice on good hygiene when providing feed and water to wild birds can mitigate this issue.

Louping ill virus or prior exposure to louping ill virus was again detected in various batches of red grouse (*Lagopus lagopus*) around Scotland this quarter - screening for louping ill on managed grouse moors is a common activity. Louping ill is an OIE listed disease and is of economic concern to the viability of grouse rearing in Scotland.

**Reference**

Trichomonosis in wood pigeons (*Columbia palumbus*)
- Summary including possible threats – Point for Awareness
- Concern for the health and welfare of free-living pigeons

Several reports were received of a large numbers of wood pigeons (*Columbia palumbus*) being found dead or seen lethargic and reluctant to move. The majority were found in rural areas in the south east of England and members of public reported sometimes seeing just piles of feathers and the remains of carcasses (up to 20 in an area). Some were seen in people’s gardens where they could be observed ill for a few days before death. Cases were reported to the Defra Avian Influenza Helpline and some carcasses were collected and delivered to VI centres for AI screening and postmortem examination. Examinations confirmed the presence of trichomonosis (Figure 6) which is known to affect wood pigeons, feral pigeons (*Columbia livia*), collared doves (*Streptopelia decaocto*) and other birds including birds of prey and finches and several other garden birds that are gregarious and seed eating. Mortality incidents involving wood pigeons have previously been found during winter months in GB, and in one outbreak reported in Spain and Portugal approximately 2,600 wood pigeons were thought to have died from the disease (Höfle et al 2004).

A disease factsheet is available at: [https://www.gardenwildlifehealth.org/portfolio/trichomonosis-in-garden-birds-2/](https://www.gardenwildlifehealth.org/portfolio/trichomonosis-in-garden-birds-2/)

Reference

**APHA DoWS Paul Holmes, APHA Shrewsbury**

**Lead poisoning in a whooper swans (Cygnus cygnus)**

- **Summary including possible threats – Point for awareness**
- **Concern for the health and welfare of free-living waterfowl**

A whooper swan (*Cygnus cygnus*) carcase was submitted as part of the Wild Bird Avian Influenza Surveillance scheme following the deaths of several whooper swans at a National Nature Reserve (NNR) in North Yorkshire. At post mortem examination, the proventriculus and gizzard contained grass, weeds and numerous small pieces of lead shot, up to 5mm in diameter. Subsequent tissue lead analysis found levels consistent with lead poisoning (18.1mg/kg FT). Following submission of the carcase, a live whooper swan was found in a weakened state on the reserve. It was caught and admitted to a local veterinary practice, where radiographs showed the presence of a large number of fragments of lead within the alimentary tract (Fig 7). During this winter period, eight birds have been affected out of the wintering population of approximately 150 whooper swans. A possible source of the lead shot is a nearby pond which lies outside the NNR where wildfowling has occurred for at least 40 years.

Edward Fullick, APHA Thirsk

**PPMV-1 detected in feral pigeons in Pembrokeshire**

- **Summary including possible threats – Point for awareness**
- **Potential threat to nearby poultry, concern for the health and welfare of free-living pigeons, concern by the public**

Pigeon paramyxovirus type 1 (PPMV-1) was isolated from two separate mortality events in Pembrokeshire within a month; the sites were 2.5 miles apart. The first incident involved over twenty feral pigeons (*Columba livia*) that were found dead over three days along with
several other birds observed to be fluffed up and lethargic. Three were submitted for post mortem examination where no clinically significant gross post mortem findings were noted. Virus isolation in tissue culture of pooled brain tissue isolated a cytopathic haemagglutinating virus identified as PPMV-1. In the second incident, five wood pigeons (Columbia palumbus) were found dead of which three were submitted for post mortem examination. Notable findings included greenish colour of the intestinal contents in two of the three birds submitted. Paramyxovirus can cause greenish faeces and PPMV-1 involvement was again confirmed by virus isolation of pooled brain tissue.

PPMV-1 is not species specific and can affect domestic poultry as well as wild and captive pigeons. In domestic poultry, the infection is regarded as Newcastle disease, which is a notifiable disease. Therefore suspect cases in kept/captive pigeons must be reported to the APHA using the DEFRA helpline 03000 200 301.

Adrienne Mackintosh and Angela Damaso Peksa, APHA Carmarthen
David Welchman, SIU, APHA

Novel Rotavirus in Pigeons
- Summary including possible threats – Point for Information (PFI)
- Concern for the health and welfare of free-living pigeons, threat to poultry unknown

Rotaviruses are known to infect a wide variety of avian species, including poultry and wild birds. Rotaviruses are excreted in large numbers in the faeces of infected birds leading to heavy environmental contamination, with clinical signs including diarrhoea in young birds. They are common in poultry production, with a prevalence of up to 46.5% worldwide. However, rotaviruses are found at low levels in feral birds. Recently, a novel, more virulent strain of rotavirus has been reported to have caused a number of mortalities in domestic pigeons (Australia 2016; Germany, Belgium, Denmark 2017/2018). The EM team at Weybridge has also identified a rotavirus (via electron microscopy) from a pathology submission from a racing pigeon with a necrotic liver (personal communication EM unit, Weybridge), similar to that described in the recent literature. The threat to poultry is unknown.

Reference


APHA DoWS
UK Priority and Conservation Concern Species

Bird reports

Wildfowl and Wetlands Trust Translocation projects

Great Crane Project

Faecal screening (10 samples) as part of post release health monitoring of cranes released between 2010 and 2014 as part of the Great Crane Project (GCP) in Somerset were negative for Campylobacter and Salmonella but were positive for coccidia (6), *Capillaria* spp. (1), spirurid ova (5) and ‘flagellated protozoa’ (2). A single faecal sample from a wild crane in Norfolk (not from GCP) was similarly negative for those bacterial pathogens but positive for coccidia. An adult GCP bird was found dead with avian mycobacteriosis lesions.

WWT

Amphibian reports

Amphibian reports from the IoZ

4th Quarterly Report and Annual Review from the IoZ for GBWDSP

In 2018, a total of 353 disease incident reports (DIRs) of sick or dead amphibians, involving 2168 individuals (385 sick/1783 dead), were received from 222 sites from England, Scotland and Wales. The majority of reports involved anurans (from 204 sites of which 166 sites had multiple mortality incidents).

Post-mortem examinations (PMEs) were conducted on 87 amphibians from 54 sites, which comprised various species: common frog (*Rana temporaria*) (64 PMEs); common toad (*Bufo bufo*) (6 PMEs); smooth newt (*Lissotriton vulgaris*) (four PMEs); palmate newt (*Lissotriton helveticus*) (four PMEs); and, nine newts for which the species could not be identified due to advanced carcass decomposition.

Chytrid fungi and ranavirus surveillance

- *Batrachochytrium salamandrivorans* (*Bs*); potential threat to newt health and biodiversity if *Bs* becomes established in the wild in GB;
- *Batrachochytrium dendrobatidis*; threat to amphibian health, welfare and potential threat to biodiversity;
- Ranavirus threat to amphibian health, welfare and biodiversity
At PME, skin swabs were collected from each amphibian for real-time duplex PCR screening for chytrid fungi (*Batrachochytrium dendrobatidis* (*Bd*) and *B. salamandrivorans* (*Bsal*)): all samples tested negative.

To date, *Bsal* has only been confirmed in captive amphibians in GB (Fitzpatrick and others, 2018) and has not yet been detected in the wild (Cunningham and others, 2019). Vigilance for possible incursion of *Bsal* into free-living amphibians in GB continues as a scanning surveillance priority. *Bsal* is considered a significant threat to native species biodiversity and animal welfare, particularly to the great crested newt (*Triturus cristatus*), which is known to be susceptible to fatal *Bsal* infection.

A suspected diagnosis of ranavirus disease, based on multiple dead anurans during the summer months with clinical signs consistent with ranavirosis, was assigned at 10 sites in 2018, all of which involved common frogs. Liver samples were collected from all amphibians examined post-mortem (where the state of carcass preservation permitted collection) for screening using a real-time PCR for ranavirus. As reported in Q3, four samples tested positive for ranavirus DNA: three common frogs from two sites from England (total mortality: six and 10 common frogs, respectively), and a newt of unknown species submitted from the same site as a positive common frog (total mortality: four newts of unknown species, six common frogs) from England.

**References**


**Winterkill**

- **Summary including possible threats – Point for Information (PFI);**
- **Public concern**

During late February/early March 2018, Great Britain (GB) experienced unusually low temperatures with hard frosts and snow, which coincided with the emergence of amphibians from their over-wintering sites and the onset of the breeding season. As reported in Q1, an increased number of reports regarding mass mortality incidents in amphibians were received from across the country, sometimes involving up to 100 dead common frogs at a single site. To address public concern about winterkill-associated mortalities, a factsheet was created which includes information on the proposed mechanisms for winterkill and mitigation strategies to reduce the likelihood of its occurrence.
Ranid and bufonid herpesvirus skin disease surveillance

- Summary including possible threats – Point for Information (PFI);
- Threat to amphibian health

In 2018, a syndromic diagnosis of ranid herpesvirus skin disease was assigned to 14 sick and two dead common frogs from six separate sites from England.

Our surveillance over the past 20 years indicates that ranid herpesvirus skin disease is endemic in common frogs in GB, with widespread distribution at apparently low prevalence, and a pronounced seasonal peak during the early spring (Franklinos and others, 2018). Field observations indicate that morbidity and mortality rates associated with this disease are low, and that affected amphibians often recover, although there is some evidence for disease recurrence in multiple years in affected ponds. Please refer to our Q2 report for more information.

In addition to ranid herpesvirus skin disease, recent research in Switzerland has detected the presence of Bufonid herpesvirus 1 (BfHV1) in association with dermatitis and mortality in common toads at sites around the country since 2014 (Origgi and others, 2018). Since common toads are believed to be in decline in both GB and Switzerland (Petrovan and others, 2016), there is a need to understand the occurrence and impact of disease threats to this species. It is currently unknown whether BfHV1 is present in GB and we remain vigilant for reports of skin disease in the common toad.

References


‘Ranid and Bufonid Herpesvirus Skin Disease’ factsheet: https://www.gardenwildlifehealth.org/portfolio/ranid-and-bufonid-herpesvirus-skin-disease/
Toadfly (*Lucilia bufonivora*)
- Summary including possible threats – Point for Information (PFI);
- Public concern

As reported for Q3, we received a single DIR involving two common toads affected by ‘Toadfly’ (*Lucilia bufonivora*) from the same site in Worcestershire, England, in July 2018.

*Lucilia bufonivora* is distributed throughout North West Europe and is thought to be a native and obligate parasite of the common toad in GB. Whilst there is no evidence that ‘Toadfly’ cases occur at a scale sufficient to cause population decline in GB, the condition typically leads to the death of the affected animal, and can generate public concern. To address this, a ‘Toadfly’ disease factsheet is available on the GWH website. For further information, please refer to WQR3.

Reference
Toadfly’ disease factsheet: https://www.gardenwildlifehealth.org/portfolio/toad-fly-lucilia-bufonivora/

IoZ

Severe Perkinsea Infection
- Summary of possible threats – Point for Information (PFI)
- Threat to amphibian health

Severe Perkinsea Infection (SPI) is a recently identified disease of tadpoles in the USA that is caused by a clade of protozoa in the Perkinsea phylum. First detected in 1999, SPI is the second-most frequently recorded cause of tadpole mortality after ranavirosis in the USA: numerous species of anuran from a diverse range of habitat types have been impacted, and mortality rates of over 95% are frequently reported in affected tadpole populations.

Phylogenetic analyses have revealed that the causative protozoa belong to the Novel Alveolate Group 01 (NAG01), and that SPI is associated with a distinct clade within NAG01, often referred to as the Pathogenic Perkinsea Clade of frogs (PPC). However, while PPC organisms are almost always associated with disease, other members of the NAG01 group have been detected in environmental samples and reported in association with Apparently subclinical infections of tadpoles in numerous other countries around the world, including the United Kingdom (UK) where PCR-positive samples were obtained from tadpoles (*Rana temporaria* and *Bufo bufo*) (n=3/40 from two sites in England) and seven freshwater environments (n=7) in England.
Although SPI has not been reported in the UK to date, tadpole mortality events are infrequently reported, and investigation is hampered by a frequent inability to perform meaningful post-mortem examinations, primarily because of rapid carcass decomposition. The susceptibility of native British anuran species to PPC organisms is unknown, and therefore the clinical significance of these protists remains unknown.

References


Isidoro-Ayza, M., Lorch, JM., Grear, DA., Winzeler, M., Calhoun, DL, Barichivich, WJ. (2017) Pathogenic lineage of Perkinsea associated with mass mortality of frogs across the United States. Scientific Reports, 7:10288. DOI: 10.1038/s41598-017-10456-1

APHA DoWS

CETACEANS

Predicting global killer whale population collapse from PCB (Polychlorinated biphenyl) pollution

Summary including possible threats – Action;
Major conservation concern for apex marine predators

As reported for Q3, a recent study has found that PCB-mediated effects on killer whale (Orcinus orca) health are resulting in reduced fecundity and immunosuppression, threatening the long-term viability of >50% of the population worldwide. Results of the study, which analysed global data on polychlorinated biphenyl (PCB) concentrations in killer whale tissues, predict that, over the next 50-100 years, killer whale populations feeding at high trophic levels and/or inhabiting waters near industrial regions are at high risk of collapse.

Evidence of extremely high PCB tissue concentrations in a stranded killer whale in GB in 2017, alongside population data showing a lack of killer whale reproduction in British waters over the last 25 years, suggests that the British resident population of this species, currently numbering only eight individuals, may be one of the first to become extinct. Interventions to mitigate future impacts of PCBs, such as those employed in North
America, where efforts have successfully led to a decline in PCB levels in humans and marine biota, are recommended to prevent a similar outcome for other killer whale populations in European waters.

**Reference**


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