

In This Issue

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CLOUDY WITH A CHANCE OF ENCEPHALITIS

The manuscript by **Dutta et al.** provides the information related to weather and anthropogenic determinants of transmission of Japanese encephalitis (JE), a zoonotic disease endemic in most parts of Asia. Weather and anthropogenic risk factors that drive the disease transmission in endemic area is discussed. The findings help in developing a timely strategic plan for JE prevention and control that can further reduce the risk of JE virus infection in both pigs and humans of JE endemic areas. Further, this will keep alert the local health authority and administrator for a better management of any future outbreak of JE.

TROUBLE'S A-BREWING

Hernandez et al. compared the relationship between the health and prevalence/diversity of pathogens of wild birds in shade-grown coffee and secondary forest in Costa Rica. Birds utilizing shade-grown coffee plantations could be at higher risk for pathogen exposure and transmission because they often aggregate in high densities, are exposed to other species more directly and, based on previous findings, share their environment with free-roaming chickens which were found to be infected with significant avian pathogens. To achieve this, focus was placed on six target resident species that represented a gradient of foraging strategies and locations, translating to a gradient of exposure.

THANKS FOR SHARING

Anthropogenic change functions as an important driver of emerging infectious disease and human waste is the most ubiquitous type of environmental disturbance. **Pesapane**

et al. evaluate the occurrence of fecal bacterial transmission between banded mongoose and humans in protected and unprotected areas in Chobe Botswana. Fecal *E. coli* isolates collected from both banded mongoose and humans demonstrated a high degree of genetic similarity. High levels of antimicrobial resistance are also identified in mongoose, even within protected areas. The exchange of antimicrobial-resistant microbiota between humans and wildlife identifies an emerging health threat in the region and highlights the need for improved waste management.

ER-RAT-TIC BEHAVIOR

Urban rats are challenging pests. Ecologically based integrated pest management (EBIPM) programmes rely on the understanding of ecological relationships between pests and their environments, with emphasis on the processes influencing pest populations in the target ecosystem. **Tamayo et al.** investigated the temporal distribution of urban rat infestations in Madrid, Spain, and tested for the effect of several environmental variables thereon. The study identified previously unrecognized periods that are prone to rat infestations and provided local authorities engaged in preserving urban ecosystem health with ecological information to support the prospective implementation of newly tailored EBIPM programmes.

SIN NOMBRE VIRUS

Sin Nombre Virus (SNV) is responsible for the majority of hantavirus pulmonary syndrome (HPS) cases in North America, many of which (ca. 35%) are fatal. The most common mechanism for SNV is inhalation of virally contaminated particulates. The greatest number of HPS cases

has occurred during the summer and spring seasons in rural peridomestic environments. However, little is known of how human use of peridomestic settings contributes to potential exposure of SNV. Here, **Richardson et al.** evaluated human exposure risk to aerosols during four seasons, performing sweeping and walking actions both indoors and outdoors.

I TOAD YOU SO...

The emerging fungal pathogen, *Batrachochytrium dendrobatidis* (Bd), has been implicated as a cause of global amphibian population declines. American bullfrogs are one species of amphibian that have been widely reported as tolerant carriers of Bd. Here **Gervasi et al.** examined whether bullfrogs raised from eggs to metamorphosis in outdoor mesocosms were susceptible to Bd. The study experimentally exposes metamorphs to Bd in the laboratory and compared mortality rates of pathogen-exposed animals to controls (non-exposed) in two separate experiments; one using a Bd strain isolated from a Western toad and another using a strain isolated from an American bullfrog. Gervasi et al. show for the first time that bullfrogs were highly susceptible to one strain of Bd and not the other. In both experiments, infection load decreased over time, suggesting that metamorphic bullfrogs from some populations may be inefficient long-term carriers of Bd.

GOOD PETS GONE BD

The chytrid fungus *Batrachochytrium dendrobatidis* (Bd) is a pathogen of frogs and salamanders, having not been shown previously to infect the limbless, mostly soil-dwelling caecilians. **Gower et al.** report results of the largest survey of Bd in caecilians, for more than 200 specimens from five countries in Africa and South America representing nearly 20 species, 12 genera, and 8 families. Positive DNA results were recovered for 58 specimens from Tanzania and Cameroon (4 families, 6 genera, 6+ species). This study also reports lethal Bd infection in one species of terrestrial caecilian in the pet trade.

NEWT MY PROBLEM

Amphibians in the southern Appalachian Mountains—a global hotspot of diversity for lungless salamanders—are

facing the potentially interactive effects of environmental stressors and emerging infectious disease. In this study, **Rothermel et al.** detected fungal and viral pathogens in stream salamander communities in a protected watershed. Despite moderately high prevalence of ranaviral infection in multiple species of *Desmognathus*, the historical suite of species persists with high probabilities of site occupancy (0.60–1.00). Their results contrast with catastrophic amphibian declines associated with disease emergence in other montane areas, but broader population monitoring and disease surveillance are needed to understand host–pathogen dynamics and their consequences for headwater stream ecosystems in this region.

DON'T CROAK!

Chronic exposure to environmental stressors can suppress immune function in vertebrates, making them more susceptible to pathogens. Stress has thus been implicated as a driver of disease emergence in wildlife, particularly in amphibians. It is less clear, however, whether natural stressors—those with which organisms may have had a long evolutionary history—are necessarily stressful or predispose individuals or populations to infection. **Brunner et al.** found that chronic exposure to three common environmental challenges do not necessarily elicit physiological stress responses and do not make wood frog tadpoles more susceptible to an emerging, lethal ranavirus individually or as a population.

WHALE MEET AGAIN

Antimicrobial resistance has been recognized as a potentially dangerous side effect of the treatment of bacterial diseases in clinical human and veterinary settings. The anthropogenic usage and inevitable spread of these antimicrobials makes it highly likely that sympatric species are also impacted. More evidence of antimicrobial resistance is being found in widely dispersing marine animals, such as seals. Using a database generated from real time treatments of marine mammals in a rehabilitation facility, **Bass et al.** demonstrate that antimicrobial resistance has increased over a span of 6 years in these animals and suggest multiple contributing factors to the observed pattern.