

## LETTERS

low (10), our findings support the use of preventive hygiene measures (4) to minimize zoonotic risk when handling roe deer. The 2 MLVA-typed strains provided no evidence for spillover of the predominant strain involved in the Q fever epidemic in the Netherlands. More studies are required to adequately understand Q fever cycles in wildlife and their relationship with Q fever in domestic animals and humans.

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## Ranavirosis in Invasive Bullfrogs, Belgium

**To the Editor:** Massive global declines in amphibians have been attributed to various causes, including infectious diseases such as chytridiomycosis and ranavirosis. Chytridiomycosis and ranaviral disease are international notifiable diseases because they have been listed by the World Organisation for Animal Health in its Animal Health Code.

Ranavirosis is caused by icosahedral cytoplasmic DNA viruses that belong to the family *Iridoviridae*, in particular by 4 species of *Ranavirus*: Frog Virus 3 (FV3), Bohle iridovirus, *Ambystoma tigrinum* virus, and a possible species *Rana catesbeiana* virus Z. In Europe, FV3 has been identified in several outbreaks of ranavirosis, characterized by mass deaths, notably in green frogs (*Pelophylax* sp.) in Denmark, Croatia, and the Netherlands (1,2); *Rana temporaria* and *Bufo bufo* in the United Kingdom (3,4); and *Alytes obstetricans* and *Ichthyosaura alpestris* in Spain (5). The invasive exotic bullfrog (*Lithobates catesbeianus*) has been introduced in several European countries and has established large breeding populations in France, Italy, Germany, Greece, and Belgium (6).

In addition to their direct effect on native amphibians through competition and predation, bullfrogs are thought to be carriers of chytridiomycosis (7,8) and, possibly, ranaviruses. Although mass deaths of *L. catesbeianus* tadpoles has been reported in aquaculture facilities, *L. catesbeianus* tadpoles are generally considered a subclinical reservoir of ranaviruses in the United States (9).

To assess the role of bullfrogs as carriers of ranaviruses in Europe, we collected 400 clinically healthy tadpoles of *L. catesbeianus* from 3 invasive bullfrog populations at Hoogstraten, Belgium (51°47'N,

4°75'E) during May–June 2010. All larvae were euthanized as part of an invasive species eradication project and stored at –20°C until further use. At necropsy, liver tissues were collected, and DNA was extracted by using the Genomic DNA Mini Kit (BIOLINE, London, UK). PCR to detect ranavirus was performed as described by Mao et al. (10).

Three samples showed positive results with this PCR. These samples were sequenced by using primers M4 and M5 described by Mao et al. (10) and blasted in GenBank. A 100% homology with the common midwife toad (*A. obstetricans*) ranavirus partial major capsid protein gene (GenBank accession no. FM213466.1) was found (5). Despite the low prevalence of *Ranavirus* infection (0.75%) in the bullfrog tadpoles examined, this study shows that invasive bullfrogs, a known reservoir of chytridiomycosis, are also a likely carrier of ranaviral disease in Europe.

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## Rift Valley and West Nile Virus Antibodies in Camels, North Africa

**To the Editor:** Different arboviral diseases have expanded their geographic range in recent times. Of them, Rift Valley fever, West Nile fever, and African horse sickness are of particular concern. They are endemic to sub-Saharan Africa but occasionally spread beyond this area. Trade and transport of animals and animal products, along with wildlife movements, are considered the driving factors in the spread of these pathogens.

In wide regions of Africa, 1-humped camels (*Camelus dromedarius*) are valuable livestock appreciated as a meat source and as a means for transportation of goods. Camels are susceptible to infection by Rift Valley fever virus (RVFV), West Nile virus (WNV), and African horse sickness virus (AHSV), although their epidemiologic role in these diseases is uncertain (1–3). Movements of camels across the Sahara Desert could carry these pathogens to northern Africa. To test this hypothesis, we conducted a serologic survey in 1-humped camels intercepted at different points by the Moroccan Veterinary Services in 2009. The camels were coming from the southeastern part of the Sahara Desert going to the northwest.

Serum samples were obtained in Smara-Laayoune, Dakhla, and Tata (Table). Most samples (71 of 100 total samples) were from male camels. Samples were also grouped by age of the camels (Table). RVFV antibodies were detected by using a competitive ELISA (4), and samples yielding positive ELISA results were confirmed by virus-neutralization test. WNV-specific antibodies were detected by ELISA (5), and positive results were confirmed by virus-