

would conclude that it might increase spread of bacterial drug resistance. Prompt recognition of carbapenem-resistant *Salmonella* spp. and initiation of appropriate infection control measures are essential to avoid spread of these organisms.

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## Contagious Caprine Pleuropneumonia in Endangered Tibetan Antelope, China, 2012

**To the Editor:** Contagious caprine pleuropneumonia is a severe respiratory disease of goats caused by *Mycoplasma capricolum* subsp. *capripneumoniae* (Mccp), a member of the *M. mycoides* cluster (1). Mccp infection is associated with a 60% mortality rate and 90% illness rate, and the disease can cause substantial losses of live-stock (1,2). We report a 2012 outbreak of contagious caprine pleuropneumonia in endangered Tibetan antelope (*Pantholops hodgsonii*) in China.

In 2000, the International Union of Conservation of Nature first listed

the Tibetan antelope as an endangered species (3), and in 2004, the number of these antelope was estimated at 150,000 (4). Most Tibetan antelope live on China's Qinghai–Tibet Plateau at an altitude of 3,700–5,500 m (3).

During September–December 2012, ≈2,400 endangered Tibetan antelope were found dead in the Naqu area of Tibet; the dead animals represented 16% of the 15,000 Tibetan antelope thought to live in the area. Necropsy was performed on 13 of the antelope at sites within the Shenzha, Shuanghu, and Nima localities of the Naqu area (online Technical Appendix Table 1, [wwwnc.cdc.gov/EID/article/20/1/13-0067-Techapp1.pdf](http://wwwnc.cdc.gov/EID/article/20/1/13-0067-Techapp1.pdf)). Gross pathologic lesions were localized exclusively to the lung, where severe pleuropneumonia with partial hepatization was observed (Figure, panel A). The lungs of some affected antelope displayed a thickening of the interlobular septa, pleuritis, and an accumulation of straw-colored pleural fluid. The pleural exudate solidified to form a gelatinous covering on the lung (Figure, panel B).

Samples of lung tissue from 5 of the antelope were selected for histologic examination. Four of the samples showed fibrinous pneumonia with serofibrinous fluid and an inflammatory cell infiltrate consisting mainly of lymphocytes in the alveoli (Figure, panel C) and bronchioles (Figure, panel D). One sample showed pulmonary edema with a protein-rich fluid effusion in alveoli.

Lung tissue from each of the 13 antelope was minced and inoculated into modified Hayflick broth, which has been used extensively to isolate *Mycoplasma* spp. from animals. Cultures were incubated at 37°C in a humidified atmosphere of 5% CO<sub>2</sub> (5). The medium was examined daily by comparing inoculated broth with an uninoculated control broth. Moderate turbidity, a color change from pink to yellow, and an appreciable swirl of the culture when rotated were used as indicators of

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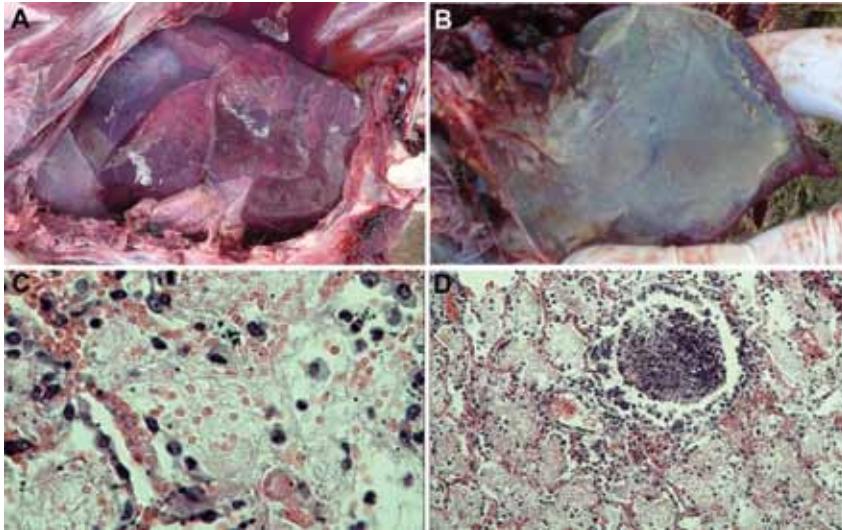


Figure. Pneumonia caused by *Mycoplasma capricolum* subsp. *capripneumoniae* in Tibetan antelope (*Pantholops hodgsonii*), Tibet, 2012. A) Lung of a caprine pleuropneumonia–infected Tibetan antelope (sample SZM2) showing lung hepatization. B) Lung of a caprine pleuropneumonia–infected Tibetan antelope (sample SH3) showing fibrin deposition. C and D) Fibrinous pneumonia with serofibrinous fluid and an inflammatory cell infiltrate, consisting of mainly lymphocytes, in the alveoli (panel C, sample SZM2, hematoxylin and eosin stain; original magnification  $\times 400$ ) and bronchioles (panel D, sample SH3, hematoxylin and eosin stain; original magnification  $\times 100$ ). Refer to online Technical Appendix Table 1 ([wwwnc.cdc.gov/EID/article/19/12/13-0067-Techapp1.pdf](http://wwwnc.cdc.gov/EID/article/19/12/13-0067-Techapp1.pdf)) for details of the lung samples used to generate images for this figure.

mycoplasma growth. After 2–3 passages in culture, 11 of 13 samples showed growth of mycoplasma. The presence of mycoplasma-like particles in the 11 growth-positive cultures was confirmed by electron microscopy (online Technical Appendix Figure 1). Collectively, these observations implicated mycoplasma as the cause of disease in the affected antelope.

We next screened lung samples from each of the 13 Tibetan antelope by PCR for evidence of *M. mycoides* cluster and *M. bovis*. Eleven samples were positive for Mccp, but no other types of mycoplasma were detected (online Technical Appendix Tables 1, 2). We conducted PCR as described (6) on the *arcD* gene of Mccp. In brief, we conducted 35 cycles of 30 s at 94°C, 15 s at 47°C, and 15 s at 72°C. Of note, lung sample SH7, which showed pulmonary edema, was negative for mycoplasma by PCR and culture. Lung samples from the 13 dead Tibetan antelope were also tested for an additional 16 potential pathogens

(online Technical Appendix Tables 1, 2) by PCR or reverse transcription PCR. No pathogens other than Mccp were detected.

To assess the relationship of the Mccp strain isolated from infected Tibetan antelope with previously isolated Mccp strains and the closely related *M. capricolum* subsp. *capricolum* (Mcc), we analyzed a 562-bp segment of the H2 gene of Mccp, which was used to distinguish the Mccp and Mcc as reported by Lorenzon et al. (7), isolated from an infected Tibetan antelope in Shuanghu county (sample SH3). The partial H2 sequence (GenBank accession no. KC441725) had higher sequence identity with Mccp isolates (99.3%–99.7%) than with Mcc isolates (90.2%–91.2% (online Technical Appendix Figure 2). This phylogenetic analysis demonstrated that the Mccp isolated from infected Tibetan antelope belongs to the same clade as Mccp strains previously isolated in Africa and Asia.

The changing habitat of endangered Tibetan antelope may lead to increased exposure to Mccp, which can cause devastating outbreaks, such as the one reported here. Goats and sheep are herded on grasslands at an altitude of 4,300–5,000 m, the same area where Tibetan antelope reside. Goats are a reservoir for Mccp, and Mccp has been isolated from sheep in mixed herds with goats (8). Rail lines traverse the rangelands in this region, limiting the normal migration patterns of the Tibetan antelope population. Interaction among goats, sheep, and Tibetan antelope in this region, combined with the effect of human infringement on their rangeland, may increase the risk for disease emergence and transmission.

Our results show that contagious caprine pleuropneumonia may pose a substantial threat to the survival of endangered Tibetan antelope. Surveillance for Mccp infection among Tibetan antelope populations and domestic and wild goat and sheep populations that have close contact with the Tibetan antelope should be considered.

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## Unexpected *Brucella suis* Biovar 2 Infection in a Dairy Cow, Belgium

**To the Editor:** Belgium was declared free of bovine brucellosis by the European Union in 2003 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:156:0074:0078:EN:PDF>). To maintain this status, the Federal Agency for the Safety of the Food Chain implemented a monitoring program, approved by the European Union, that consists of random serologic surveys and mandatory reporting of spontaneous abortion. This reporting enabled the detection of 2 outbreaks of bovine brucellosis in cattle caused by *Brucella abortus* biovar 3, in 2010 and 2012, but the origin of these outbreaks has not been identified.

As part of an epidemiologic survey conducted to prevent the spread of the infection, ELISA testing (Brucellosis Antibody Test Kit; Idexx, Hoofddorp, the Netherlands) was performed on bulk milk samples from 9,013 dairy farms in the country; 75 farms had positive test results and were classified as reactor farms. All cows in

milk production on these farms were serologically tested, first by using slow agglutination test with the addition of EDTA to the antigen, and then, if results were positive, by a commercial ELISA. If results of the ELISA were positive, a confirmatory internal ELISA was performed at the national reference laboratory. A total of 41 seropositive cows from 27 farms were identified. All confirmed seropositive cows were slaughtered for bacteriologic investigation; all had negative test results for *B. abortus*.

On March 23, 2012, bulk milk sample testing for a farm in the province of Namur showed positive results. Testing performed in January 2011 on milk collected from the same farm had yielded negative results. The 150 cattle (including 55 dairy cows) on this farm were further serologically tested. One nonpregnant dairy cow had positive test results by slow agglutination test and ELISAs and was slaughtered on April 23, 2012. The cow was >4 years old, born in the farm, last calved in March 2011, and showed no clinical sign of brucellosis.

Bacteriologic examination was conducted on spleen, uterus, lymph nodes, and udder tissue samples; *Brucella* spp. were cultured from the spleen and uterus. Bacterial colonies grew on *Brucella* agar supplemented with 5% horse serum in the presence of basic thionine and safranin O; CO<sub>2</sub> was not required for growth, and H<sub>2</sub>S was not produced. The isolates showed catalase, oxidase, and urease activity, a biochemical profile typical of *B. suis* biovar 2; identity was confirmed by real-time PCR on DNA extracted directly from the uterus (1).

A stamping out with compensation policy was implemented for this farm by the Federal Agency for the Safety of the Food Chain, according to European Union regulations, and subsequent epidemiologic investigations were performed. The farm owner is not a hunter. The culture-positive cow originated from a group of 10