goats remain in pastures might have favored environmental contamination by interaction with wildlife. Furthermore, an additional case of *M. microti* infection in a cat reported in 2011 in the same region also had the SB0118 spoligotype (7), which demonstrated that this bacillus is actively circulating in animals from this area.

*M. microti* was previously isolated on the basis of a skin test–positive result for cattle in the United Kingdom (8), which demonstrated the risk for infection in livestock. These findings raise concern on reliability of diagnostic tests used for bovine tuberculosis surveillance. *M. microti*, which is phylogenetically similar to *M. bovis* or *M. caprae* and widely disseminated in the environment, could be responsible for misleading diagnostic results, as demonstrated in this study.

Highly specific tests are needed to accurately identify *M. bovis* (or *M. caprae*) infection at antemortem examination through use of specific antigens, such as ESAT 6 and CFP10, which are absent in *M. microti* and are currently used in the interferon-γ test in France (9). In addition, at postmortem diagnosis, use of specific molecular tools capable of rapidly distinguishing members of the MTBC should be considered. Histopathologic analysis lacks specificity, and obtaining results for bacterial culture takes too much time for these particularly slow-growing and fastidious mycobacteria.

*M. microti* has already been reported to cause tuberculosis in immunocompromised and immunocompetent patients in France (10). Thus, potential risk for infection of humans by consumption of raw goat milk cheese cannot be ruled out.

Acknowledgments

We thank Dorothee Watrelot-Virieux, the regional laboratory of Savoie, the local veterinary services, and Fabrice Chevalier for providing epidemiologic information; and Victoria Boschiroli for useful comments on the article.

References


Address for correspondence: Maria L. Boschiroli, Agence Nationale de Sécurité Sanitaire de l’Alimentation, de l’Environnement et du Travail, 14 Rue Pierre et Marie Curie, Maison-Alfort 94700, France; email: maria-laura.boschirolli@anses.fr

---

**Mycobacterium orygis—Associated Tuberculosis in Free-Ranging Rhinoceros, Nepal, 2015**

**Jeewan Thapa,1 Sarad Paudel,1 Yogendra Shah, Bhagwan Maharjan, Gretchen E. Kaufman, Deborah McCauley, Kamal P. Gairhe, Toshio Tsubota, Yasuhiko Suzuki, Chie Nakajima**

Author affiliations: Hokkaido University, Sapporo, Japan (J. Thapa, S. Paudel, Y. Shah, T. Tsubota, Y. Suzuki, C. Nakajima); National Trust for Nature Conservation, Biodiversity Conservation Center, Chitwan, Nepal (A. Sadaula); German Nepal Tuberculosis Project, Kathmandu, Nepal (B. Maharjan); Veterinary Initiative for Endangered Wildlife, Bozeman, Montana, USA (G.E. Kaufman, D. McCauley); Chitwan National Park Department of National Parks and Wildlife Conservation, Chitwan (K.P. Gairhe)

DOI: http://dx.doi.org/10.3201/eid2203.151929

1These first authors contributed equally to this article.
To the Editor: *Mycobacterium orygis*, previously described as oryx bacilli, has recently been categorized as a member of *M. tuberculosis* complex and has been reported to cause tuberculosis (TB) in a variety of animals and in humans. Most reported isolates were of South Asian origin (1). In a previous study (2), we isolated and molecularly characterized *M. orygis* isolates from wild animals living in a captive facility in Kathmandu, Nepal.

The greater one-horned rhinoceros (*Rhinoceros unicornis*), or Indian rhinoceros, is the largest species of rhinoceros. It is listed in Appendix I of the Convention on International Trade in Endangered Species (https://cites.org/eng/app/appendices.php), designated as vulnerable by the International Union for Conservation of Nature Red List (http://www.iucnredlist.org/search), and designated as a protected species by the Government of Nepal (3). Because of successful conservation efforts, the current wild population of greater one-horned rhinoceros in Nepal and India has increased from 600 in 1975 to 3,555 in mid-2015 (4). As of 2015, the population of these rhinoceros in Nepal was 645, including 605 animals living in Chitwan National Park (CNP) (5).

On February 16, 2015, CNP officials observed a sick female rhinoceros in the buffer zone of the western sector of the park near Amaltari. The rhinoceros was dull, depressed, and not feeding. The following day, the animal was found dead in the same area (online Technical Appendix Figure 1, http://wwwnc.cdc.gov/EID/article/22/3/15-0425-Techapp1.pdf). Superficial maggot-infested wounds were on both sides of the vulva, indicating that the rhinoceros was not able to naturally remove the maggots and suggesting that the animal was sick for some time. During the necropsy, several granulomatous lesions were observed in the lungs and considered to be compatible with TB infection. The lesions were extensively distributed and well encapsulated and contained caseous necrotic material (online Technical Appendix Figure 2). No other pathologic changes were observed in any of the organs examined, leading to the conclusion that the rhinoceros died from TB.

A lung tissue sample positive for TB by acid-fast staining was cultured on Lowenstein-Jensen media. We performed spoligotyping and mycobacterial interspersed repetitive units–variable-number tandem-repeat (MIRU-VNTR) procedure on the isolate as previously described (6,7). Spoligotyping analysis, performed as previously described (2), showed that the isolate had a spoligo–international type 587 pattern, indicating it was *M. orygis*. We also performed multilocus sequence typing on various genes (2), and confirmed that the isolate was *M. orygis*. We then constructed a dendrogram by comparing the MIRU-VNTR result from rhinoceros isolate with published *M. orygis* MIRU-VNTR types (Figure) (1,2,8). The rhinoceros *M. orygis* isolate fell in a unique position in the dendrogram; we identified a difference in only 1 locus (MIRU-424) when we compared the isolate with the largest cluster of reported *M. orygis* isolates, including those previously reported from Nepal.

In our earlier study (2), we isolated *M. orygis* from chital deer (*Axis axis*) and blue bull (*Boselaphus tragocamelus*) from a captive wild-animal facility and postulated that the origin of the infection might be from infected animals in CNP, where the deer and blue bull originated. This new finding of a different strain type of *M. orygis* in a free-ranging rhinoceros in CNP provides evidence for our hypothesis. Other reports of *M. orygis* in captive wild animals in Nepal (2), cattle and a rhesus monkey in Bangladesh (1), humans in South Asia (1), and an immigrant from India in New Zealand (9) further support this bacterium’s potential widespread distribution in South Asia and attests to the One Health significance of this organism.

In a demographic study of rhinoceros in Nepal (10), the animals were found to be living in a narrow area of...
Another Dimension

Emerging Infectious Diseases accepts thoughtful essays, short stories, or poems on philosophical issues related to science, medical practice, and human health. Topics may include science and the human condition, the unanticipated side of epidemic investigations, or how people perceive and cope with infection and illness. This section is intended to evoke compassion for human suffering and to expand the science reader’s literary scope. Manuscripts are selected for publication as much for their content (the experiences they describe) as for their literary merit.
Tuberculosis Caused by *Mycobacterium orygis* in Free-Ranging Rhinoceros, Nepal, 2015

Technical Appendix

**Technical Appendix Figure 1.** Location of Amaltari in Chitwan National Park from where rhinoceros was found dead. Kathmandu is place of captive facility from where *Mycobacterium orygis* was reported from wild animals.
Technical Appendix Figure 2. Granulomatous tuberculosis lesion with caseous mass in lungs.