

## Letters to the Editor

### *Clostridium difficile* Toxinotype V, Ribotype 078, in Animals and Humans<sup>∇</sup>

Two publications describing the important role of *Clostridium difficile* PCR ribotype 078 were published recently in the Journal of Clinical Microbiology. Keel and coworkers have described variability of *C. difficile* types isolated in animals and reported ribotype 078 to be most prevalent in isolates from swine (83%) and cattle (94%) (3). In a letter published a few months later, Goorhuis and coworkers corroborated this observation by detecting the same type in The Netherlands in a small number of strains isolated from pigs. They also showed ribotype 078 as the third most prevalent type in certain Dutch hospitals (2), a finding that was not observed in the study by Keel et al. Moreover, toxinotype V strains can include two ribotypes, 078 and 066. All ribotype 078 strains tested to date belong to toxinotype V, while ribotype 066 strains can belong to toxinotype V or VI.

We would like to point out two additional aspects. First, toxinotype V/ribotype 078 is indeed more often isolated from humans than could be concluded from Keel's paper. Data from the United States presented at the 2nd International *Clostridium difficile* Symposium in 2007 (B. M. Limbago et al., abstract book, p. 15; <http://www.clostridia.net/IcdsAbstract%20Book.pdf>) reported ribotype 078/toxinotype V to be the third most prevalent type in community-associated *C. difficile* disease. In the European prevalence study on hospital strains performed during a 2-month period in 2005, ribotype 078 was the 11th most prevalent type in Europe, representing 2.8% (9/322) of all toxigenic strains (1). Of all 14 countries involved (including also The Netherlands), ribotype 078 represented >10% of the strains only in Greece.

Additional data on *C. difficile* isolated from hospitalized patients in Germany and Switzerland suggest that toxinotype V/ribotype 078 is as common in both countries as reported by Goorhuis et al. (2). In Germany, where hospitals in Goettingen and the surrounding area were involved in the study, toxinotype V/ribotype 78 represented 7.3% of the strains in 2003 and 7.5% in 2006. In Switzerland (Basel), only a small selection of strains was analyzed in 2003 and 5 of 29 strains (17.2%) were toxinotype V. However, the percentage decreased to 9% in 2005 (9/100) and to 5.6% (5/88) in 2006. For these strains, the ribotype was not determined.

In France, data from the National Reference Laboratory for *Clostridium difficile* indicate that toxinotype V/ribotype 078 significantly increased in northern France from 3.25% (8/246) in July to December 2006 to 11.1% (16/144) in July to December 2007 ( $P = 0.001$ ).

Second, toxinotype V/ribotype 078 is indeed the most prevalent type in several animal species worldwide (calves, pigs, horses). However, Canadian studies reported lower prevalence rates of ribotype 078 in calves (22.5%) (4). For European

countries, data on typed strains are available for Slovenia, where we detected *C. difficile* in pigs, but only two of three farms were affected by toxinotype V/ribotype 066 (and not 078) while a third farm had toxinotype 0 (ribotype different from 078 but not identified).

In summary, toxinotype V/ribotype 078 seems to be well adapted to animal hosts. Depending on the geographic location, other subtypes of toxinotype V are associated with animals, particularly with piglets. In humans, this type is present at least from 2003 onward in different countries and its prevalence seems to be increasing.

#### REFERENCES

1. Barbut, F., P. Mastrantonio, M. Delmée, J. S. Brazier, E. J. Kuijper, and I. R. Poxton on behalf of the European Study Group on *Clostridium difficile* (ESGCD). 2007. Prospective study of *Clostridium difficile* infections in Europe with phenotypic and genotypic characterisation of the isolates. *Clin. Microbiol. Infect.* **13**:1048–1057.
2. Goorhuis, A., S. B. Debast, L. A. van Leengoed, C. Harmanus, D. W. Notermans, A. A. Bergwerff, and E. J. Kuijper. 2008. *Clostridium difficile* PCR ribotype 078: an emerging strain in humans and in pigs? *J. Clin. Microbiol.* **46**:1157–1158.
3. Keel, K., J. S. Brazier, K. W. Post, S. Weese, and J. G. Songer. 2007. Prevalence of PCR ribotypes among *Clostridium difficile* isolates from pigs, calves, and other species. *J. Clin. Microbiol.* **45**:1963–1964.
4. Rodriguez-Palacios, A., H. R. Staempfli, T. Duffield, A. S. Peregrine, L. A. Trotz-Williams, L. G. Arroyo, and J. S. Brazier. 2006. *Clostridium difficile* PCR ribotypes in calves, Canada. *Emerg. Infect. Dis.* **12**:1730–1736.

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