Abstract. The common species and subgenotypes causing cryptosporidiosis were studied in 394 children and 627 animals with diarrhea in Vellore in southern India. Although no zoonotic strains were identified in 13 infected children, 1 of 12 infected animals had C. hominis, indicating the potential for cross-species transmission. This study also reports C. xiaoi for the first time in India.

Cryptosporidiosis is a common parasitic infection causing diarrhea in humans and animals. Although diarrhea in livestock results in economic loss, symptomatic and asymptomatic infections in animals have the potential for transmission and are a threat to public health. Cryptosporidium spp. are generally considered to be host specific. Cryptosporidium galli and C. baileyi are found predominantly in chickens, C. muris in rodents, C. canis in dogs, C. felis in cats, C. suis in pigs, and C. meleagris in turkeys; and in recent years, C. xiaoi in sheep and goats. In cattle, although C. parvum is seen in calves, C. bovis, C. ubiquitum, C. ryanae, and C. andersoni have been reported from heifers and adult cows. In humans, cryptosporidiosis is predominantly caused by C. hominis and C. parvum, with occasional reports of zoonotic species including C. meleagris, C. felis, and C. canis.

In India, there have been numerous studies of cryptosporidiosis in humans and a few in animals, but only one recent study from eastern India has investigated zoonotic transmission. In previous studies from Vellore, we identified C. hominis as the predominant species in children with diarrhea from the community and hospital, with differences in the distributions of subgenotypes depending on the study setting. In this study, we explored the potential for zoonotic transmission of cryptosporidiosis in this region by comparing cryptosporidial species in animals and children with diarrhea in the same geographic area.

Diarrheal samples from animals were collected from a veterinary clinic and several dairy farms near Vellore during February 2007–May 2008. At the dairy farms, diarrheal samples from 589 cows (25 were calves), 2 buffaloes, 11 bullocks, and 25 goats (11 were kids) were collected, including 589 cows (25 were calves), 2 buffaloes, 11 bullocks, and 25 goats (11 were kids). The mean duration of diarrhea was 4.5 days for adult animals, 4 days for calves, and 3 days for goat kids. Twelve (1.9%) samples were positive for Cryptosporidium spp., by PCR. Among these samples, seven C. muris, three C. bovis, one C. parvum, and one C. hominis were identified by RFLP. However, sequencing of the SSU ribosomal RNA PCR product showed that banding patterns identified by RFLP as C. muris were C. andersoni and the banding patterns identified as C. bovis were C. xiaoi. Further sequencing and analysis of the actin and HSP-70 PCR products confirmed the isolates as C. xiaoi (Figure 1).

Cryptosporidium andersoni was identified in adult cows, and C. xiaoi was identified in one goat and two cows. Cryptosporidium parvum was also identified in a goat kid, and C. hominis was also identified in a cow. No cryptosporidia were identified in buffaloes or bullocks.

Most studies from India and other countries have documented C. parvum as the predominant species in calves; in
other regions, *C. bovis* has been found to predominate.5,7,9 *Cryptosporidium andersoni* is recognized as a major species in adult cattle.5,8,10 This finding is consistent with that of our study in which we detected *C. andersoni* in 7 adult cows. *C. andersoni* has also been reported in 3 of 2,414 patients with diarrhea,19 suggesting possible zoonotic transmission to humans.

This study is the first report of *C. xiaoii* in India and is also the first report of this species in a cow. Previous reports have documented *C. xiaoii* in sheep, goats, and lambs.18 When the *C. parvum* and *C. hominis* animal isolates were subjected to Cpgp and C. parvum reverse zoonotic transmission. Although studies in northern India have documented the presence of diverse species of *Cryptosporidium* in cattle,7,10 *C. hominis* has not been reported in animals in any studies in India. To address zoonotic transmission in more detail, ongoing longitudinal studies are being conducted in the community where animal–human contact is prolonged.

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