

## Potentially Same Novel *Ehrlichia* Species in Horses in Nicaragua and Brazil

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**To the Editor:** In our previously published report, we found that blood samples from 4 naturally infected horses in Nicaragua were PCR positive for the 16S rDNA, *sodB*, and *groEL* genes of an *Ehrlichia* species (1). Similarly, Vieira and colleagues reported a potentially novel *Ehrlichia* sp. infecting horses in South America, with a high seroprevalence in carthorses; 1 horse blood sample was PCR positive for *Ehrlichia* 16S rDNA and *dsb* genes (2). Because these 2 studies sequenced different 16S rDNA regions, the *Ehrlichia* sp. found in Nicaragua could not be established as the same one infecting horses in Brazil.

We retrieved an *Ehrlichia* PCR-positive horse blood sample (2) from Brazil and performed partial PCR and sequencing of the 16S rDNA, *sodB*, and *groEL* genes (1). Phylogenetic analysis of the sequences (3–5) demonstrated a close relationship between the *Ehrlichia* spp. found in Brazil and Nicaragua, with posterior probability values of 100% for all 3 gene fragments (online Technical Appendix Figure 1, <https://wwwnc.cdc.gov/EID/article/24/5/17-2076-Techapp1.pdf>). The 16S rDNA were 100% identical (181 bp/181 bp; GenBank accession no. KJ434178), *sodB* 99% identical (561 bp/567 bp; GenBank accession nos. MG385129, KJ434180), and *groEL* 99% identical (579 bp/584 bp; GenBank accession nos. MG385128, KJ434179). When we compared translated amino acid sequences of the *Ehrlichia* spp. from Brazil and Nicaragua, we observed high percent age identities with the *groEL* (100%) and *sodB* (97.8%) alignments (online Technical Appendix Figure 2). Furthermore, when compared with *E. ruminantium*, the most closely related *Ehrlichia* sp. on the basis of phylogenetic analyses, percent age identities from the *groEL* (94.8%) and *sodB* (78.8%) alignments were lower for both *Ehrlichia* spp.

These findings suggest that the novel *Ehrlichia* spp. found infecting horses in Nicaragua and Brazil are potentially the same species. Future studies are needed to determine cell culture practices, characterize potential

clinical signs of infection, and establish the main vector of this novel equine *Ehrlichia* species.

### References

1. O’Nion VL, Montilla HJ, Quorollo BA, Maggi RG, Hegarty BC, Tornquist SJ, et al. Potentially novel *Ehrlichia* species in horses, Nicaragua. *Emerg Infect Dis*. 2015;21:335–8. <http://dx.doi.org/10.3201/eid2102.140290>
2. Vieira TS, Vieira RF, Krawczak FS, Soares HS, Guimarães AM, Barros-Filho IR, et al. *Ehrlichia* sp. infection in carthorses of low-income owners, southern Brazil. *Comp Immunol Microbiol Infect Dis*. 2016;48:1–5. <http://dx.doi.org/10.1016/j.cimid.2016.07.002>
3. Sela I, Ashkenazy H, Katoh K, Pupko T. GUIDANCE2: accurate detection of unreliable alignment regions accounting for the uncertainty of multiple parameters. *Nucleic Acids Res*. 2015;43(W1):W7–14. <http://dx.doi.org/10.1093/nar/gkv318>
4. Drummond AJ, Suchard MA, Xie D, Rambaut A. Bayesian phylogenetics with BEAUti and the BEAST 1.7. *Mol Biol Evol*. 2012;29:1969–73. <http://dx.doi.org/10.1093/molbev/mss075>
5. Darriba D, Taboada GL, Doallo R, Posada D. jModelTest 2: more models, new heuristics and parallel computing. *Nat Methods*. 2012;9:772. <http://dx.doi.org/10.1038/nmeth.2109>

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## Human Infection with *Burkholderia thailandensis*, China, 2013

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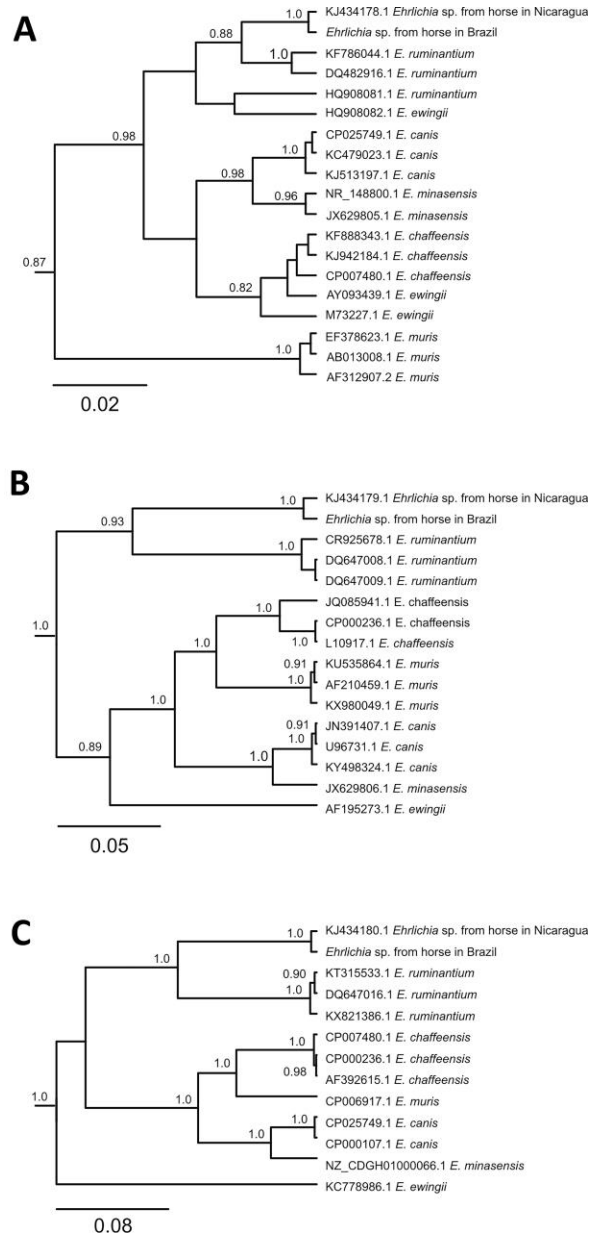
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**To the Editor:** We read with interest the research letter from Chang et al. (1). To have such severe clinical disease attributed to *Burkholderia thailandensis* infection

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## Technical Appendix



**Technical Appendix Figure 1.** Phylogenetic analysis of gene fragments of *Ehrlichia* isolates found in horses in Nicaragua and Brazil compared with reference strains. Trees were constructed by using 181 bp of 16S rDNA (A), 561 bp of *groEL* (B), and 579 bp of *sodB* (C) genes.

**A**

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      10      20      30      40      50
KJ434179.1 Ehrlichia sp. from horse in Nicaragua Y L S P S I L D Y H Y G K H H Q G Y V N A L N N L V M G T N F S D Y T N E D L P T V I K A T H G N L
Ehrlichia sp. from horse in Brazil V
CR925678.1 E. ruminantium . . . . . A N V . N . . . . . A . . . . . D . C T C . . . . . A . . . . . S D .

      60      70      80      90     100
KJ434179.1 Ehrlichia sp. from horse in Nicaragua E T R S I F N N A G Q V W H N F Y W Q S I K K N G G G V P V X K L L D M I N K D F G D I N K F N Y
Ehrlichia sp. from horse in Brazil E
CR925678.1 E. ruminantium A . . . . . T . . . . . V V T . K G E . . . . . R . . . . . E S V E . . . . . N

      110     120     130
KJ434179.1 Ehrlichia sp. from horse in Nicaragua A F T E A G K S H F G S G W V W L V F D F T E Q K L K I L C T A N G D T P
Ehrlichia sp. from horse in Brazil
CR925678.1 E. ruminantium . . . . . G . . . . . T V . . . . .

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**B**

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      10      20      30      40      50
KJ434179.1 Ehrlichia sp. from horse in Nicaragua R G Y L S P Y F V T N S E K M L V E F E N P Y I L L T E K K L N I I Q P I L P I L E N V A R S G R P
Ehrlichia sp. from horse in Brazil
CR925678.1 E. ruminantium . . . . . L . . . . . I . . . . .

      60      70      80      90     100
KJ434179.1 Ehrlichia sp. from horse in Nicaragua L L I I A E D V E G E A L S T L V L N K L R G G L H V A A V K A P G F G D R R K D M L G D I A I L T
Ehrlichia sp. from horse in Brazil
CR925678.1 E. ruminantium . . . . .

      110     120     130     140     150
KJ434179.1 Ehrlichia sp. from horse in Nicaragua G A K H V I N D E L A I K M E D L T L A E L G T A K N I R I T K D T T T I I G S V D N S A A N V Q S
Ehrlichia sp. from horse in Brazil
CR925678.1 E. ruminantium . . . . . C D . . . . . C . H . . . . .

      160     170     180     190
KJ434179.1 Ehrlichia sp. from horse in Nicaragua R I S Q I K M Q I E N S T S D Y D K E K L R E R L A K L S G G V A V L K V G G S S E V E
Ehrlichia sp. from horse in Brazil
CR925678.1 E. ruminantium . . . . . C . R . . . . . D . . . . . Q . . . . .

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**Technical Appendix Figure 2.** Alignment of partial amino acid sequences of *Ehrlichia* isolates found in horses, Nicaragua and Brazil. *E. ruminantium* was used as the reference strain in sodB (A) and groEL (B) sequence alignments.