

Taxonomic Nomenclature Changes

Ethan Adams, Editor in Chief | Apr 2004

“What’s in a name? That which we call a rose by any other name would smell as sweet.” It might smell as sweet, yes, but it would be much harder to remember. In our lab we have experienced some confusion resulting from recent nomenclature changes. Hopefully the following digest of some recent name changes relevant to veterinary diagnostics will reduce confusion for other labs as well as for our own.

Perhaps the most baffling changes in nomenclature have been in the order *Rickettsiales*. The taxa designations in this order were previously based on morphological, ecological, epidemiological and clinical characteristics.

A 2001 publication by Dumler *et al.*⁵ proposed re-classification based on genetic analysis of 16S rRNA, *groESL*, and surface protein genes. A number of species formerly classified in the genera *Anaplasma*, *Ehrlichia*, *Cowdria*, *Neorickettsia* and *Wolbachia* have been re-arranged into the genera *Anaplasma*, *Ehrlichia*, *Wolbachia*, and *Neorickettsia*. *Ehrlichia equi* has been determined to be insufficiently distinct from either *Ehrlichia phagocytophila* or the human granulocytic ehrlichiosis (HGE) agent to justify separate species designations for any of these pathogens. Moreover these three agents have been—or rather, this agent has been—determined to belong in the *Anaplasma* genus. Thus *Ehrlichia equi*, *Ehrlichia phagocytophila*, and HGE are all now designated *Anaplasma phagocytophila*. Another former *Ehrlichia*, *Ehrlichia risticii*, now belongs to the *Neorickettsia* genera; it is now known as *Neorickettsia risticii*. Other *Rickettsiales* changes include: *Ehrlichia bovis* is now *Anaplasma bovis*; *Cowdria ruminatum* is now *Ehrlichia ruminatum*; *Ehrlichia platys* is now *Anaplasma platys*; and *Ehrlichia sennetsu* is now *Neorickettsia sennetsu*. Further changes have been made higher up the taxonomic tree that I will not treat here; they are detailed extensively in the Dumler publication.

In a 1998 publication by Mehlhorn and Schein⁶ it was argued that *Babesia equi* should be re-designated *Theileria equi*. Among other reasons cited for the reclassification was the fact that *equi*, in common with *Theileria* spp. first infects lymphocytes wherein it initiates a schizogonic phase resulting in the production of motile merozoites. By contrast, other *Babesia* species first enter erythrocytes. Also in common with *Theileria* spp. is *equi*'s development in the salivary glands of its vector ticks. Typical of *Theileria* spp., *equi* is not present in tick organs other than salivary glands and is not transmitted transstadially from egg to larva (though it can be transmitted transstadially from nymph to adult stages). *Babesia* spp. generally infect other tick organs in addition to the saliva glands and transstadial transmission from egg to larva is typical. The morphology of sexual stages of *equi* differs from that of typical *Babesia* spp.

Moreover, *equi* shares a surface protein common to *Theileria* spp. Furthermore, drug susceptibility of *equi* is similar to *Theileria* spp. and differs from *Babesia* spp. The membership of *equi* in the genus *Theileria* is also supported by ssRNA analysis.

Thus there is compelling developmental, morphologic, biochemical, and genetic evidence supporting *equi*'s classification as a *Theileria* spp. and *Theileria equi* is beginning to be the accepted designation, though *Babesia equi* is still widely used.

Oh, you were hoping for *interesting* reading? May I suggest *Romeo and Juliet* by William Shakespeare?