Temporal patterns in tick-borne microbe interactions

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Video Byte

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Abstract

Ticks act as vectors for many zoonotic pathogens and are an increasing threat to human and animal health, but tick-borne pathogens (TBPs) are not the only important residents inside ticks; they coexist with many other microorganisms. Tick microbial communities can affect tick health and immunity, and they can also interact directly with tick-borne pathogens. A recent study sought to characterize tick-borne microbes and their temporal dynamics and interactions. Using high-throughput sequencing, researchers studied the dynamics of microbes in specimens of the tick species *Ixodes ricinus* collected over 3 years in a peri-urban forest. They found that around 75% of sequences belonged to maternally inherited bacterial genera. The structure of the tick microbiota varied over time, with the greatest changes driven by environmental microbes. Strong relationships were observed between *Wolbachia* and *Arsenophonus*, providing evidence for the presence of the parasitoid wasp *Ixodiphagus hookeri* in ticks, and network analysis suggested that the presence of pathogens belonging to the genera *Borrelia*, *Anaplasma*, and *Rickettsia* may disrupt microbial interactions in *I. ricinus*. These data provide valuable insight into the temporal dynamics and interactions of tick-borne microbes, paving the way for the development of new strategies to control ticks and tick-borne diseases.