derived from nest-deposited engorged larvae, may attach to other mice visiting the nest during the following spring or summer. Additionally, non-fed nymphs that had detached from mice may parasitize other mice visiting that nest. Either interaction is likely to incease the capacity of the vector to transmit zoonotic agents by intensifying host-vector contact. Thus, mouse nests serve as potential venues for transmission of certain tick-borne pathogens.

179 SPECIES CONCEPTS AND *IXODES* TICKS. Telford SR*. Department of Tropical Public Health, Harvard School of Public Health, Boston, MA.

A recently published analysis of the status of the northern deer tick, *Ixodes dammini*, illustrates the problems of defining a species in parasite systems. Morphological, karyotypic, and molecular evidence, synthesised with hybridisation data, indicated that the main vector of Lyme disease in the United States is a northern population of *I. scapularis*, the blacklegged ticks (Oliver et al. 1993). Such a comprehensive report was considered to be definitive, and synonymy of the 2 species was recommended. Scrutiny of the presented evidence indicates that such an action is unwarranted. Hybridisation evidence, in particular, was considered to be conclusive. Absence of fertile hybrids is evidence for isolation. But, the converse, often used as evidence for conspecificity, is at most inconclusive (Mayr 1963). At any rate, unpublished evidence documents asymmetrical fertility (Gowan and Oliver 1978) between the 2 ticks. Morphological analyses obscured relevant taxonomic characters, and ignored the possible presence of mixed populations in geographically intermediate sites. Molecular evidence was erroneously interpreted with an insect "clock". Elegant experiments that were not emphasised indicated asymmetry in mate choice, suggesting that a specific mate recognition system (SMRS; Paterson 1980) and thus some isolation has been achieved. These considerations, coupled with behavioral distinctions that reduce the vectorial capacity of *I. scapularis*, suggest that these *Ixodes* species are not conspecific. The biological species concept shall be discussed in the light of recent concepts in evolutionary theory, and related to issues in parasitology and public health entomology.

180 PHYLOGENY OF TWO EMERGING HUMAN PATHOGENIC ARENAVIRUSES FROM SOUTH AMERICA. Gonzalez JP*, Thayu M, and Rico-Hesse R. Institut Franais de Recherche Scientifique pour le Développement en Coopération, Paris, France; and Department of Epidemiology and Public Health, Yale School of Medicine, New Haven, CT.

There are now five arenaviruses recognized as pathogenic for humans in the Americas: Junín, Machupo, Flexal, Guanarito and SPH114202. In the 1960's, two arenaviruses had been shown to cause disease in humans in the Americas, Junín and Machupo. Flexal virus, isolated in 1975, appeared to be mildly pathogenic for humans, after a laboratory infection. In 1989, Venezuelan hemorrhagic fever, caused by Guanarito virus, was first detected. 105 presumed cases and 26 deaths were reported by 1992 and several strains isolated from humans and rodents. In 1991, two cases, including one fatality, of Brazilian hemorrhagic fever have been documented and one virus strain identified, SPH114202. We studied the molecular epidemiology and origin of these two last emerging arenaviruses by comparing them genetically to others from the Americas. We obtained nucleotide sequences (by primer extension of the viral S-RNA segment) of 8 of the 12 arenaviruses circulating in the Americas, to determine their phylogenies. Guanarito virus and the SPH114202 strains were genetically distinct (approx. 30% of divergence) from other human arenaviruses. This support the hypothesis that theses viruses have been evolving independently in their endemic focus, for some time. Specific diagnostic tools (PCR/oligonucleotide probes) have been developed for clinical and epidemiological studies. These reagents allow for a rapid identification of these viruses, without the need for biological amplicfication.

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