Swarming deer flies could quickly expose people to Lyme disease and Anaplasmosis

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The study published in the December 2016 issue of the *Journal of Vector Ecology* points out that deer flies were introduced to the USA from Europe in the 1800's and have so far been found in New Hampshire, Massachusetts, Pennsylvania, and New York. Also referred to as *Lipoptena cervi* (*L. cervi*), the deer fly infests larger animals like white-tailed deer or moose by crawling into their fur coat and shedding their wings.

"For the rest of their life, the wingless adults live in the deep layers of the coat of their host, feeding on its blood and reproducing," explains Mysterud from the Department of Biosciences, Centre for Ecological and Evolutionary Synthesis, University of Oslo. The pre-pupae deer fly falls to the ground until late summer and autumn before turning into an adult with wings. [3]

Study finds deer flies positive for B. burgdorferi and A. phagocytophilum, pathogens which cause Lyme disease and Anaplasmosis.

The Buss study is the first to demonstrate that deer flies can carry *B. burgdorferi* and *A. phagocytophilum*, causative agents of LD and Anaplasmosis. As a result, the authors suggest "the risk for transmission of these pathogens via the bite of [an infected deer fly] is present."

Of the 48 deer flies collected in Pennsylvania, nearly 40% (19) were positive for B. *burgdorferi*, and 29% (14) were positive for *A. phagocytophilum*, while 6% (3) were co-infected with *B. burgdorferi* and *A. phagocytophilum*.

In comparison to a lone deer tick patiently waiting for its host to pass by, the adult deer fly moves in swarms to attack its host. They "seem to use an ambush tactic; they sit in the vegetation, waiting for a host to appear within flight range."

"When an object with some similarity to a cervid (a mammal to the deer family) appears, they fly to the presumed host, shed or tear off their wings and burrow their way into the underwool of the coat of the animal and cling to it." Buss adds, "This occurs with frequency due to the swarming habits of *L. cervi."*

The deer fly prefers the hair on the human body. "Deer ked often encounter humans and will temporarily parasitize them due to the presence of hair on the human body," states Buss. "Attacking deer keds are a considerable nuisance to domestic and semi-domestic animals and people, limiting outdoor recreational activities," explains Mysterud.

Swarming deer flies, could quickly expose people to Lyme disease and Anaplasmosis. "Humans are

accidental hosts for *L. cervi* and could be exposed to these pathogens via exposure to the keds [deer flies], as it takes 15-20 minutes for an adult deer ked to take a blood meal on a human," warns Buss.

He cautions, however, that there is "no evidence thus far that suggests that deer ked bite transmit *B. burgdorferi* or *A. phagocytophilum* to humans."

It would be of interest to investigate whether there are individuals who developed Lyme disease or Anaplasmosis after being bitten by a deer fly.

References:

1. Have you been bitten by a partially fed tick? in Dr. Cameron's All Things Lyme blog, February 29,2016. http://danielcameronmd.com/have-you-been-bitten-by-a-partially-fed-tick/.
2. Buss M, Case L, Kearney B, Coleman C, Henning JD. Detection of Lyme disease and anaplasmosis pathogens via PCR in Pennsylvania deer ked. *J Vector Ecol*, 41(2), 292-294 (2016).
3. Mysterud A, Madslien K, Herland A, Viljugrein H, Ytrehus B. Phenology of deer ked (Lipoptena cervi) host-seeking flight activity and its relationship with prevailing autumn weather. *Parasit Vectors*, 9, 95 (2016).
