



Lyme disease ticks more prevalent in deciduous forests

Ticks that are able to transmit Lyme disease are more abundant in deciduous oak forests than pine forests, according to a study conducted in Belgium, which provides an example of how landscape can influence human health. To help prevent tick attacks and the incidence of Lyme disease, the researchers suggest increased efforts are needed to raise public awareness of control measures, such as protective clothing and repellants.

Lyme disease - or Lyme borreliosis - is the most common tick-borne disease in the northern hemisphere. It is caused by *Borrelia* bacteria, carried by ticks that feed on infected hosts, such as forest-dwelling deer and rodents. The infection can then be passed onto humans or other host animals when the tick takes its next blood meal. Lyme disease can affect the skin, joints, heart and nervous system. Diagnosed cases can be treated with antibiotics. In Europe, the infection is primarily transmitted through the bite of the sheep tick, *Ixodes ricinus*. These can be found in a wide array of habitats, but their abundance is generally higher in forests. Prevention of tick attacks is considered the most effective measure against infections, and it is therefore important to know where and why ticks are abundant. While deciduous forests are more likely to contain host species for ticks, coniferous forests provide a moist environment that is also supportive of tick populations.

To investigate the influence of forest type and landscape on *I. ricinus* ticks, the researchers studied populations in 21 forests on nutrient-poor, sandy soils in the Campine region of northern Belgium over the summer. They compared numbers of ticks in 176 locations where either pine or oak was the main tree species.

The number of ticks was found to be up to 2.5 times higher in the deciduous, oak stands compared to the coniferous, pine stands. Areas of forest with high shrub cover were also found to have up to twice as many ticks as those with little shrub cover. Oak stands with high shrub cover were found to have 6-7 times more ticks than pine stands with little or no shrub cover. Ticks were also more abundant in forests with a large amount of edge habitat.

The findings suggest that tick abundance matches the location of deer hosts. Deciduous oak forests rich in shrubs provide higher quality food and shelter for deer compared to areas of pine forest. Forest edges provide good forage and cover for deer – particularly during summer when newly born deer need protection.

This is the first study of *I. ricinus* ticks on a regional scale in Belgium and reveals that tick abundance is significantly affected during summer by local habitat and landscape structure. The current regional forest management policy in Belgium¹ aims to achieve economic, ecological and social goals and large areas of pine forest are being converted into more deciduous and mixed forest. This practice brings many environmental and social benefits, such as improved soil quality, biodiversity and touristic value. However, the study findings indicate that it is also likely to increase populations of *I. ricinus* ticks, with implications for the spread of Lyme disease among humans.

As forest-based tourism and recreation are likely to increase in the future, it is important to implement strategies to minimise the incidence of Lyme disease and the researchers stress the importance of raising public awareness of Lyme disease through information campaigns. Forest visitors are encouraged to wear protective clothing, use tick repellents, check skin regularly and remove attached ticks. Previous studies have also suggested that reducing forest fragmentation and avoiding residential development adjacent to forests are effective measures for reducing the transmission of Lyme disease from ticks to humans. Further research into other factors affecting tick populations, including other host animals, is necessary to develop an integrated tick control strategy.

1. Afdeling Bos, Groen, 2001b Beheersvisie voor de openbare bossen. Ministerie van de Vlaamse Gemeenschap, Brussel, België www.inbo.be/files/bibliotheek/46/184346.pdf

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