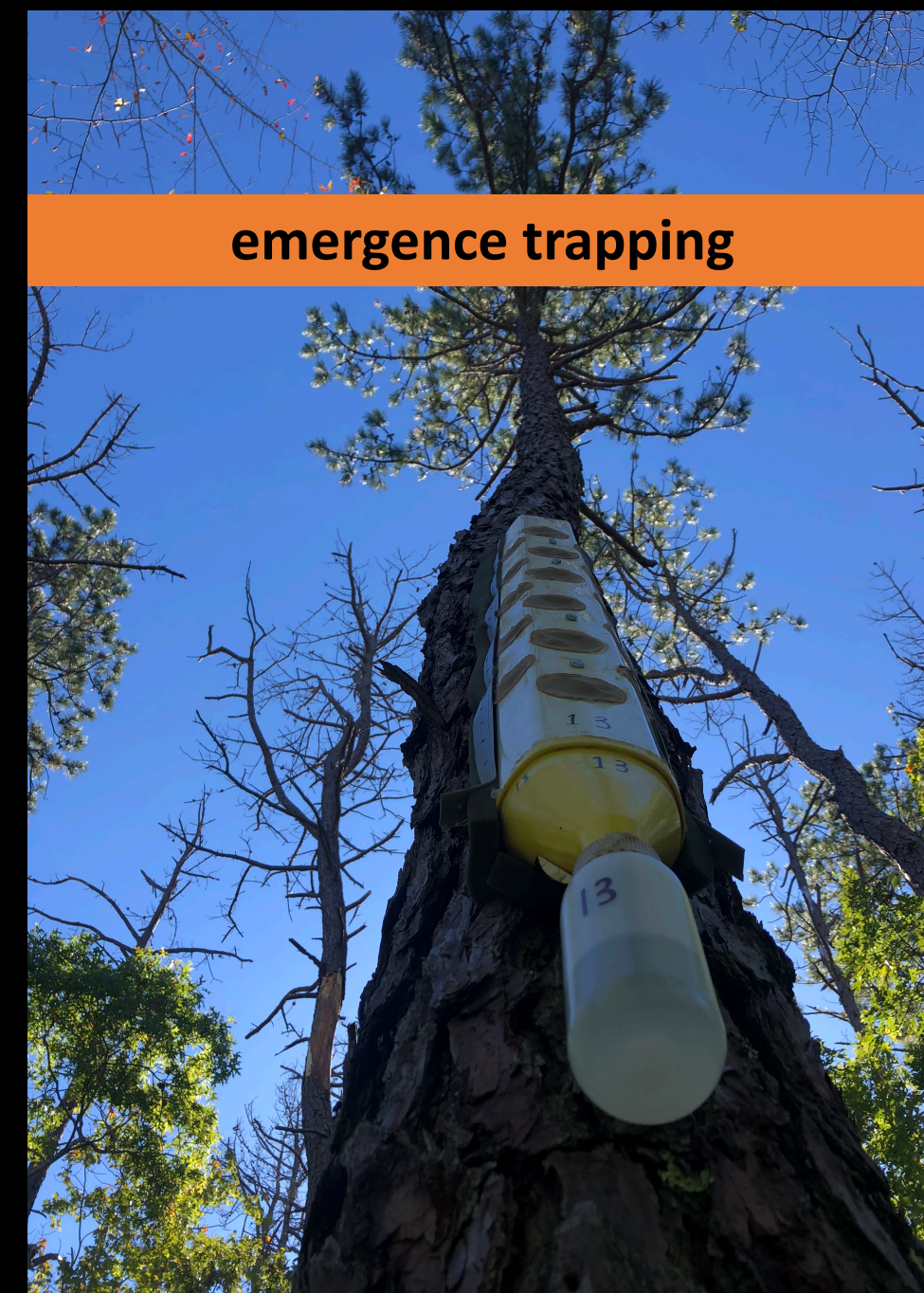




Southern pine beetle (SPB) (*Dendroctonus frontalis*)



bark sampling



emergence trapping

Figure 1. Map of study area. We sampled the insect community in SPB-attacked trees using bark sampling and emergence trapping.

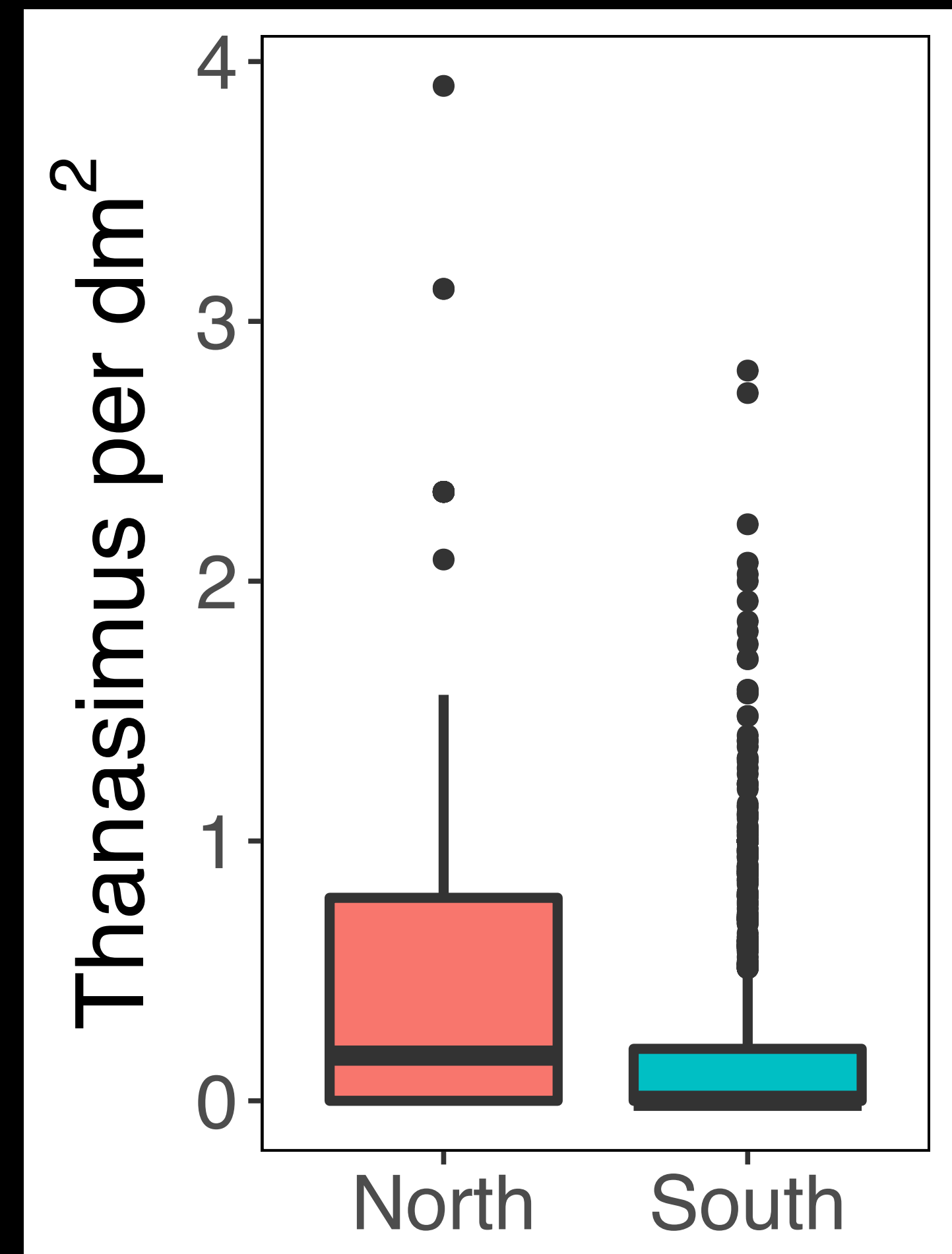


Figure 2. Predator *Thanasimus dubius* was found in similar abundance regionally.

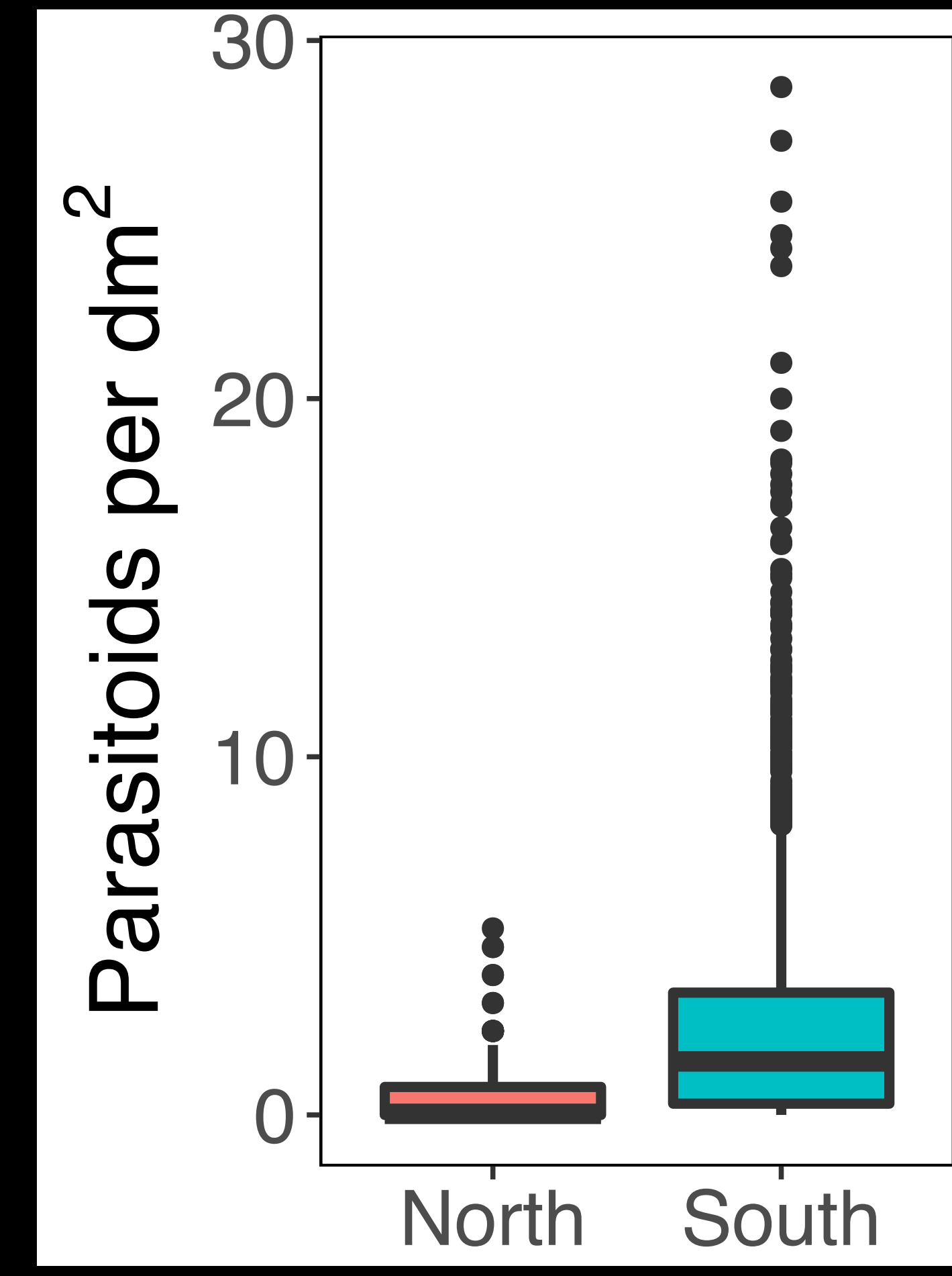


Figure 3. Parasitoid wasps were more abundant in the Southern region.



Found in % of total trees:	South	North
<i>Ips avulsus</i>	43.34	0
<i>Ips calligraphus</i>	2.84	4.55
<i>Ips grandicollis</i>	12.26	19.32

Figure 4. Where are the competitors? In NY, we captured very few *Ips* bark beetles. *Ips* are known to compete for resources with SPB, and are commonly collected in the historic range of SPB.

Community matters: a tree-killing bark beetle does not escape its natural enemies as its range expands

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Abstract

Southern pine beetle (SPB) is an outbreak insect of economic and ecological importance. The arthropod community associated with SPB, including predators, competitors, and parasitoids has been well documented and is known to impact SPB dynamics. In 2014, a major range expansion of SPB was detected (Fig. 1).

We compared the insect community associated with SPB attacks in the historic versus novel range.

We found the SPB-associated insect community in NY to be similar in composition, but with important differences in insect abundance and behavior, compared to that of the historic range.

Supporting Results

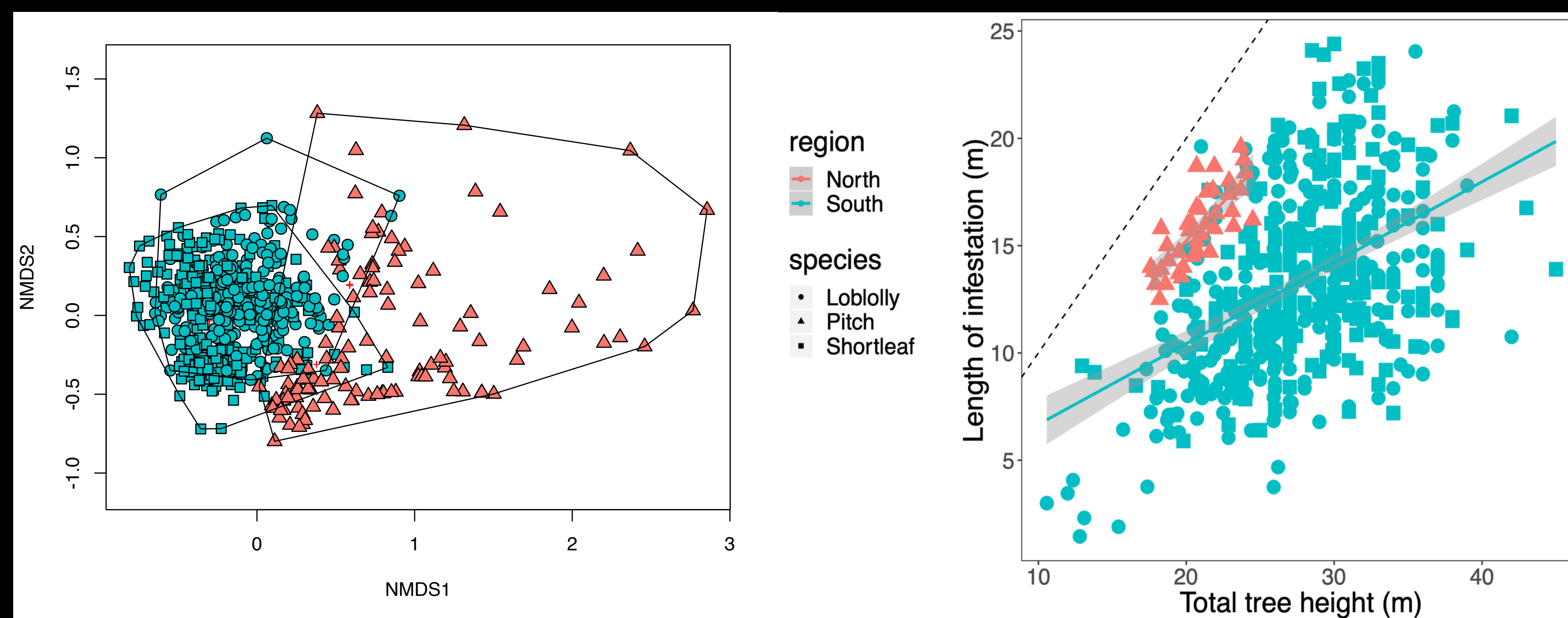


Figure 5. Nonmetric multidimensional scaling illustrates the insect community found in each tree. Community differs by tree species (adonis2, $p < 0.001$).

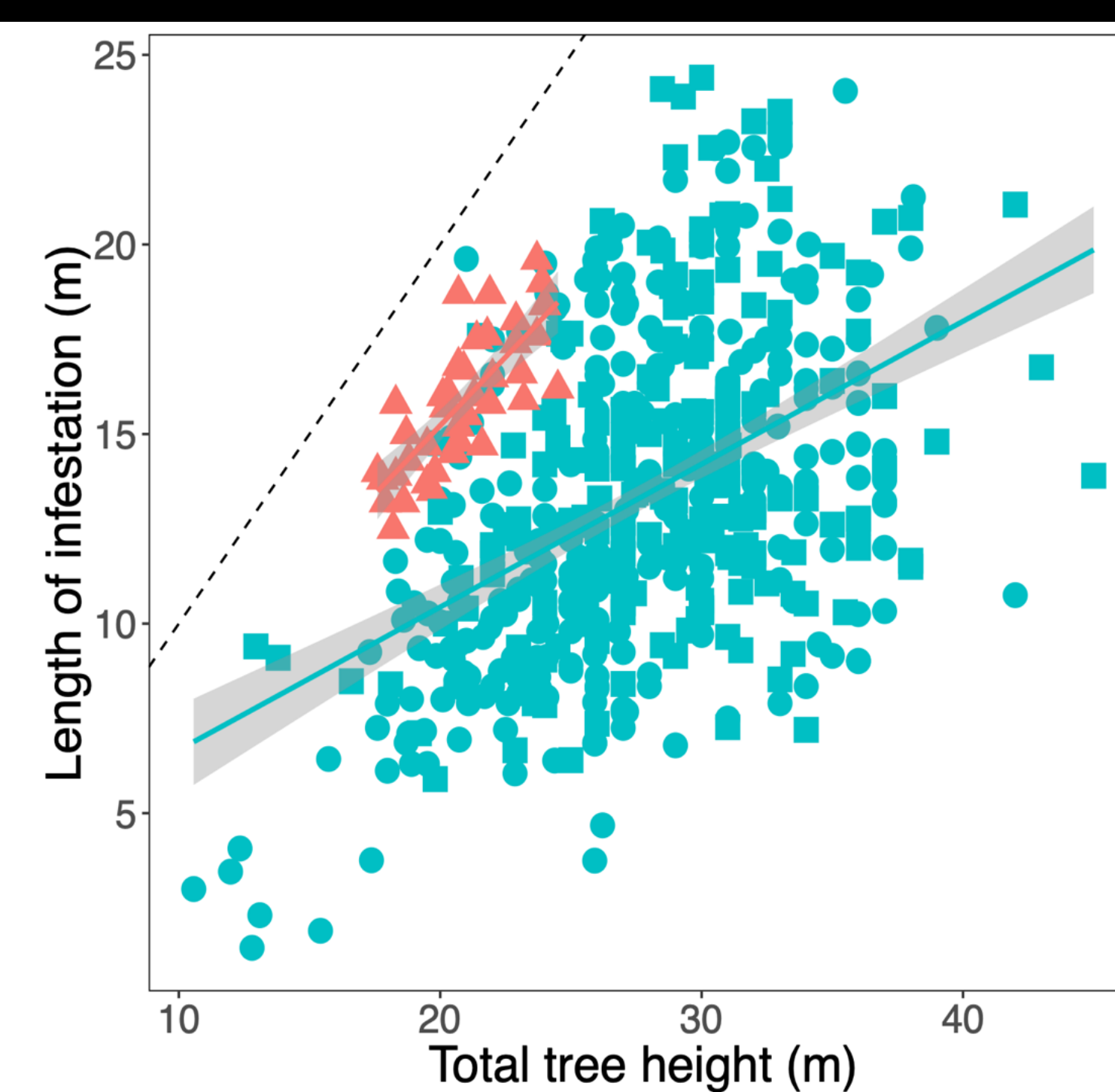


Figure 6. SPB uses a greater percentage of the host tree bole in the North. Dotted line represents 1-to-1 line where SPB uses whole tree. The lack of competitors (*Ips*) in the North may drive this pattern.

Discussion

We found that SPB did not escape its natural enemies with its range expansion—but competitors and parasitoids were less abundant in NY than in the southern range of SPB.

In New England, the primary host tree for SPB is pitch pine (*Pinus rigida*). Understanding SPB community dynamics will help inform forest management and protect the rare pine barrens of this region.

