Search the canopies and you will find new species of insects

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Abstract

Arthropods were collected by fogging the canopy of Scots pine *Pinus sylvestris* selected from a 2 km^2 boreal forest area in Sigdal, Norway with the overall purpose to examine whether there were faunal differences in the representation of arthropods among mature and old trees, and specifically for this paper, the biting midges (*Ceratopogonidae*). Target trees were chosen as pairs, one mature (70-110 years) and one old (250 years or older) tree from six different stands. All knock-down treatments were performed in June and July 1999, before dawn and after a dry and windless night.

Knocked-down arthropods were collected in plastic funnels placed systematically on the ground. Funnels remained in place for circa one hour after treatment. Among the 61 species records new to Norway, the most frequently encountered taxon of invertebrates was *Diptera*, and the family of biting midges, *Ceratopogonidae*, comprised 30 of 61 (49%) of all new records, compared with the overall species numbers showing 40 biting midges of 193 recorded species (21%).

Among the Ceratopogonidae new to Norway, two species new to science and two first records from Europe were found.

Coleman rarefaction curves were constructed by running 500 iterations without replacements using EstimateS and showed that there were significantly more new records of Diptera in old trees in comparison with mature trees. A similar pattern of significance (by comparing standard deviations estimated by EstimateS) was found for *Diptera* when *Ceratopogonidae* was excluded.

New species records of *Ceratopogonidae* were more common in old trees than in mature trees, although not significantly so. No predominance of new records in old trees was found for arthropods other than *Diptera*. Old trees are rare and may provide a variety of resources (e.g. resting sites, places to over-winter, hiding places, sites for oviposition, larval habitat, etc.) that are rarely found in younger trees.

Thus, the high number of new species records probably result from studying a whole arthropod taxon (*Diptera*) in a part of a forest ecosystem (canopies) with a suite of microhabitats (old pine trees) that in combination has been poorly investigated earlier.

References

Thunes, K.H., Gjerde, I., Hagan, D.V. & Szadziewski, R. 2008. Search the canopies and you will find new species of insects. *In:* Florén, A. & Schmidl, J. (eds.): Canopy arthropod research in Europe, pp. 215-223. Bioform, Nürnberg. ISBN 978-3-935654-01-2.

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