Range expansion of the pine processionary moth: the effects of the high temperature of the summer 2003

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Many insect species and phytophagous insects in particular, are expected to show relatively rapid responses to the rising temperatures by shifting their geographic range boundaries upward and northward. The winter pine processionary moth, Thaumetopoea pityocampa, offers a possibility to test for the effects of the increase of temperature on an insect population over a wide area of the Mediterranean basin and southern parts of Europe, where it is the most important pest of pine forests (Pinus spp.). In the last three decades a substantial expansion of the outbreak area has taken place both latitudinally and altitudinally, resulting in outbreaks in areas previously largely unaffected by the insect. The case deserves special interest for the implications it may have on the management of European forests and plantations, as well as on ornamental trees. The pine processionary moth is of particular concern also due to the public health risk (contact dermatitis) associated with the urticating hairs produced by late-instar larvae. We report about the effects of the high temperature of the summer 2003 on the moth dispersal and the consequent colonization of extreme sites in the Alps and in the Paris Basin. The further expansion observed in the winter 2003-04 can be explained by higher dispersal of female moths in the warm nights of June and July 2003. These insects are generally characterized by low mobility but in the summer 2003 they expanded as much as they did in the last two decades. Some of the expanding populations have been monitored by genetic markers and it has been shown that most individuals of the core populations are participating to the expansion. The sampling carried out in the spring 2004 showed that colonies have been successfully established in the extreme sites, posing new problems for the insect management in a wider area.

For further information: http://www.daapv.unipd.it/promoth/