UDC: 630*45:595.7:632.7(498) DOI: https://doi.org/10.53040/ppap2026.140

PHENOLOGY OF DEFOLIATING INSECTS ASSOCIATED WITH FOREST-STEPPE OAK STANDS IN EASTERN ROMANIA

PLEȘCA Bogdan-Ionut[1,2,*], https://orcid.org/0000-0001-6226-5774
CIORNEI Constantin[1]
LOGHIN Constantin-Cosmin[1,2], https://orcid.org/0009-0007-4491-0486

[1]National Institute for Research and Development in Forestry "Marin Dracea", Voluntari, Romania
[2] Forestry Faculty of Silviculture and Forest Engineering, "Transilvania" University of Braşov, Braşov, Romania
**Corresponding e-mail: bogdan.plesca@icas.ro*

The phenology of defoliating insects is essential for understanding forest ecosystem dynamics and supporting the development of forest protection strategies, particularly in the context of climate change and the increasing frequency and intensity of environmental stressors affecting forest vegetation. However, information on the phenology of defoliating insects in forest-steppe oak stands remains limited. The study area includes extensive forest-steppe landscapes, forming a belt of variable width, predominantly within the Prut River basin of eastern Romania.

The aim of the present study is to characterize the phenology of the main defoliating insect species and to assess defoliation intensity in representative forest stands of this region.

The study focused on mixed oak stands in the Moldavian Plateau. Phenological observations were conducted over two consecutive years. Assessments were conducted on *Quercus pubescens*, *Q. pedunculiflora*, *Q. petraea*, and *Q. frainetto* trees in the Voloaca–Unsu (Iași County) and Nisa–Hobana (Galați County) forests.

The defoliating insect species present were identified, defoliation was assessed, and other pests of lower importance were also recorded. For sampling purposes, the crown was divided into the lower, middle, and upper thirds, from which leafy branches were collected. Defoliation was assessed in accordance with the methodology prescribed by the current Romanian regulations for forest monitoring and protection.

Defoliation levels ranged from 5% to 15%, with slightly higher values recorded in the Nisa–Hobana Forest. The species recorded during field surveys included

Operophtera brumata and *Erannis defoliaria* (*Geometridae*); *Tortrix viridana* and *Archips xylosteana* (*Tortricidae*); *Orthosia spp*. (*Noctuidae*); *Acrobasis repandana* (*Pyralidae*); and, less frequently, *Lymantria dispar* (*Lymantriidae*), *Apethymus abdominalis* (Hymenoptera: *Tenthredinidae*), and several defoliating beetle species (e.g., *Orchestes quercus*). In 2025, the invasive oak lace bug, *Corythuca arcuata* (Hemiptera: *Tingidae*), was also recorded in the Nisa–Hobana Forest.

The study highlighted the temporal and spatial variation in defoliation, its distribution across crown strata, and potential differences among the affected oak species. In addition, relationships between the occurrence of dominant defoliating insect species and defoliation intensity during the study period were analysed. The results enable the characterization of the defoliating insect complex associated with forest-steppe stands in the Moldavian region of Romania and contribute to a better understanding of their phenology.

This research provides valuable information to support the development of forest health monitoring programmes and supports the implementation of integrated pest management strategies in forest-steppe oak stands. Integrating phenological observations with defoliation assessments may contribute to anticipating periods of increased risk and optimizing forest protection measures under current environmental change. The findings are highly relevant to current forest health issues in forest-steppe ecosystems and highlight the need for continued long-term monitoring.

Keywords: insect phenology; defoliation; oak stands; forest-steppe; monitoring; Moldavian Plateau.

Acknowledgments. This study was conducted within the framework of the following projects: PN23090303 (FORCLIMSOC Core Program 2023-2026) and 113PHE/2025 (PN-IV-PB-8.1-PRE-HE-ORG-2025-0273).