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SEASONAL DYNAMICS AND HOST PLANT PREFERENCES OF POLYPHAGOUS HEMIPTERAN PESTS IN SMALL ORGANIC MIXED GARDENS IN WESTERN ROMANIA

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Abstract: *Small mixed gardens offer heterogeneous resources for phytophagous Hemiptera, but information on their seasonal occurrence in western Romania is limited. We analyzed monthly totals recorded from April to October at six organically managed mixed-garden sites in Timiș County. Species were surveyed using yellow sticky panels, direct visual counts or mechanical shake sampling, as appropriate. Combined observations peaked in June (1,417) and July (1,229), whereas both pentatomids showed their greatest counts in September. These data describe a pronounced within-season shift from spring and early-summer aphids and flatids to late-summer/early-autumn stink bugs. Host-plant associations were noted qualitatively.*

Introduction

Small organically managed gardens combine vegetables, ornamental plants and woody hosts over short distances. This habitat mosaic can support several hemipteran herbivores simultaneously, while seasonal changes in host condition alter where individuals are observed. Monitoring such systems is relevant for smallholder plant protection because pest presence does not necessarily coincide with economically important damage. This study aimed (i) to quantify the relative numerical contribution of six monitored species, (ii) to describe their monthly dynamics and changing community composition, and (iii) to compare cumulative counts across six garden sites.

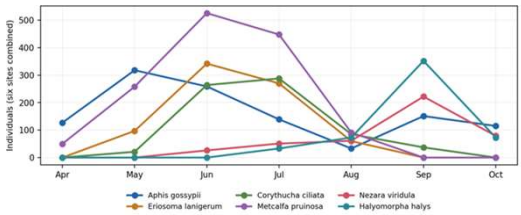
Material and method

The investigation addressed the seasonal dynamics of phytophagous Hemiptera in diversified mixed gardens, where vegetable crops, fruit trees and ornamental vegetation occur in close proximity. The study included six organically managed mixed gardens in Timiș County, western Romania. The study combined monthly counts with observations of the plants on which the target species occurred. Data were processed using descriptive statistical indicators.



Results and discussions

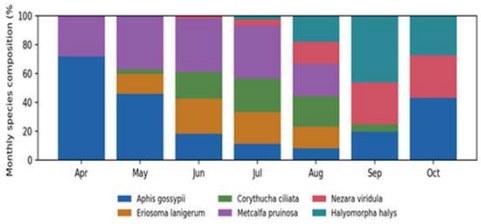
The greatest cumulative total belonged to M. pruinosa (1,373), followed by A. gossypii (1,142), E. lanigerum (769), C. ciliata (695), H. halys (531) and N. viridula (439). Species-specific monthly maxima provide practical reference points for monitoring. A. gossypii reached its peak in May (318 individuals across sites), E. lanigerum in June (342), C. ciliata in July (288) and M. pruinosa in June (526). The two pentatomids peaked in September, when 222 individuals of N. viridula and 352 of H. halys were recorded.



Monthly total numbers of the six hemipteran species pooled across the six monitoring sites.

The difference between numerical abundance and proportional representation is especially apparent in September. The two pentatomids together accounted for 574 of the 762 recorded individuals (75.3%), whereas in July they contributed only 84 of 1,229 (6.8%). An increase in percentage share can partly result from the decline of other species, but the September pentatomid counts also rose in absolute terms.

Relative monthly species composition



The change in the relative composition of records is clearer when each month is standardized to 100%. Dominant taxa therefore change even in months with fewer individuals. The pronounced contribution of late-season pentatomids is consistent with ecological literature emphasizing seasonal host use, reproductive activity and pre-overwintering behavior (TODD, 1989; MUSOLIN, 2012; LESKEY AND NIELSEN, 2018).

Site	All species (n)	Overall share (%)
Place 4	913	18.4
Place 6	866	17.5
Place 1	835	16.9
Place 3	819	16.5
Place 2	778	15.7
Place 5	738	14.9

All six localities showed M. pruinosa as the taxon with the highest seven-month count.

Earlier Romanian research documented a broad suite of hosts for M. pruinosa (VLAD AND GROZEA, 2016). A field-based organic system survey can therefore benefit from monitoring both herbaceous and woody plants. For H. halys, organic-farm studies also emphasize changes in attraction throughout the growing season and the importance of matching sampling periods to host phenology (LESKEY AND NIELSEN, 2018).

Conclusions

Over the six gardens, 4,949 hemipteran individuals were recorded during April–October. M. pruinosa represented the largest share of the records, followed by A. gossypii. Monthly totals peaked in June, while the two monitored pentatomids reached their greatest recorded abundance in September. The seasonal turnover supports differentiated monitoring schedules: focused spring–summer assessment of aphids, flatids and lace bugs, followed by intensified checks for stink bugs in late summer and autumn. Reported plant associations are useful field indications, but preference cannot be confirmed quantitatively from site-level totals.
Future observations should standardize sampling effort and document host-specific counts and damage.

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