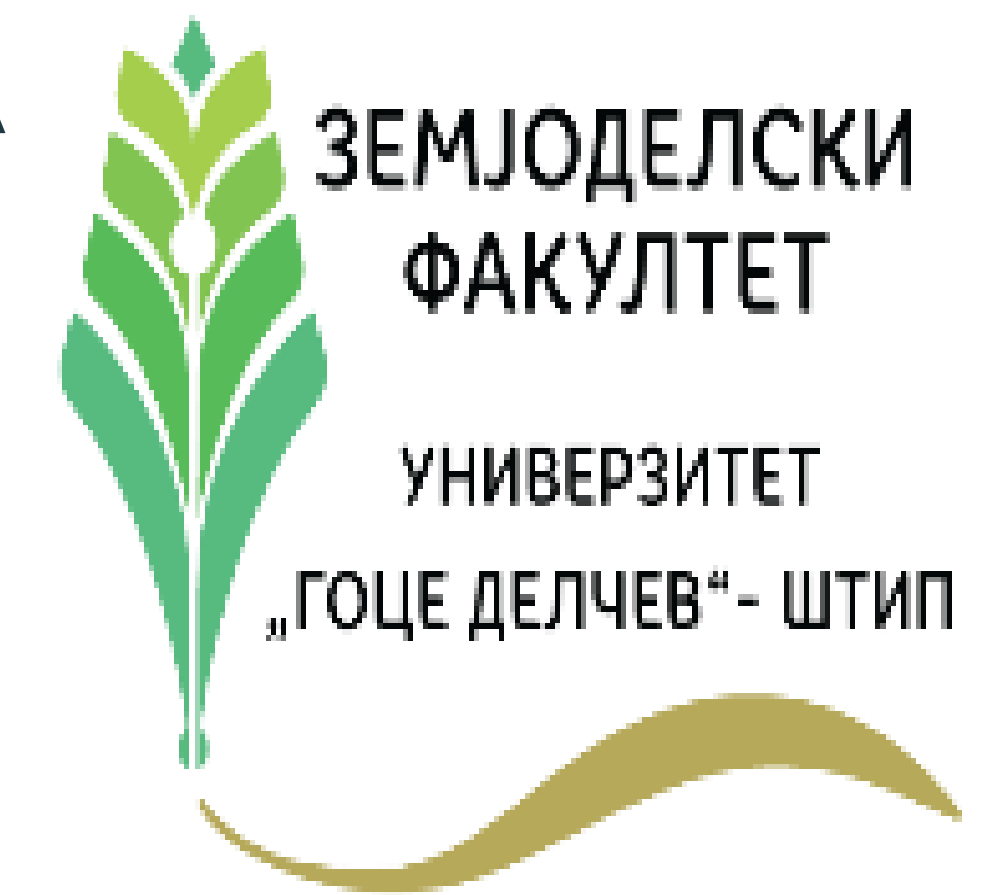


## OCCURRENCE AND POPULATION DYNAMICS OF *EURYGASTER* SPP. (HEMIPTERA: SCUTELLERIDAE) IN WHEAT FIELDS OF NORTH MACEDONIA

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### INTRODUCTION

Wheat is the main cereal crop in Republic of North Macedonia, covering over 70,000 ha annually (www.stat.gov.mk). *Eurygaster* spp. (Hemiptera: Scutelleridae) are significant pests, feeding on developing grains and reducing both yield and baking quality (Torbica et al., 2014; Dizlek & Ozer, 2024). Despite their economic importance, systematic studies in North Macedonia are scarce.

This study aimed to:

- Document occurrence and population levels of *Eurygaster* spp. in major wheat-growing regions.
- Compare 2025 infestation levels with 2024.
- Assess the impact of climate and crop phenology.
- Provide IPM recommendations.

### MATERIALS & METHODS

Surveys were conducted in five wheat-growing regions: Sv. Nikole, Probištip, Kumanovo, Skopje, and Bitola. Two inspections were performed:

- 1–15 May: stem elongation to heading stage
- 1–15 June: grain filling to early ripening

A total of 20 fields (4–6 per region) were inspected.

Population densities were estimated using:

- Visual counts: adults per 1 m<sup>2</sup> *quadrat* at five random points per field
- Sweep net sampling: 20 sweeps per transect, repeated twice per field

Data were averaged per field and compared with 2024.

Meteorological data were obtained from the National Hydrometeorological Service.

### DISCUSSION

The 2025 outbreak of *Eurygaster* spp. in North Macedonia illustrates the strong link between pest biology and climatic conditions. The unusually high adult abundance in May suggests favorable overwintering survival and synchronized migration into wheat fields. However, the sharp decline by mid-June reflects a shortened feeding and reproductive period due to accelerated crop maturation.

This outbreak-collapse pattern has been observed in other cereal-producing regions of the Balkans and Turkiye (Mutlu et al., 2014). Several studies highlight that above-average spring temperatures not only enhance early pest activity but also shorten crop-pest interactions (Moir & Szito, 2005). While this may reduce the risk of prolonged feeding, it also creates uncertainty for pest forecasting and management.

### CONCLUSION

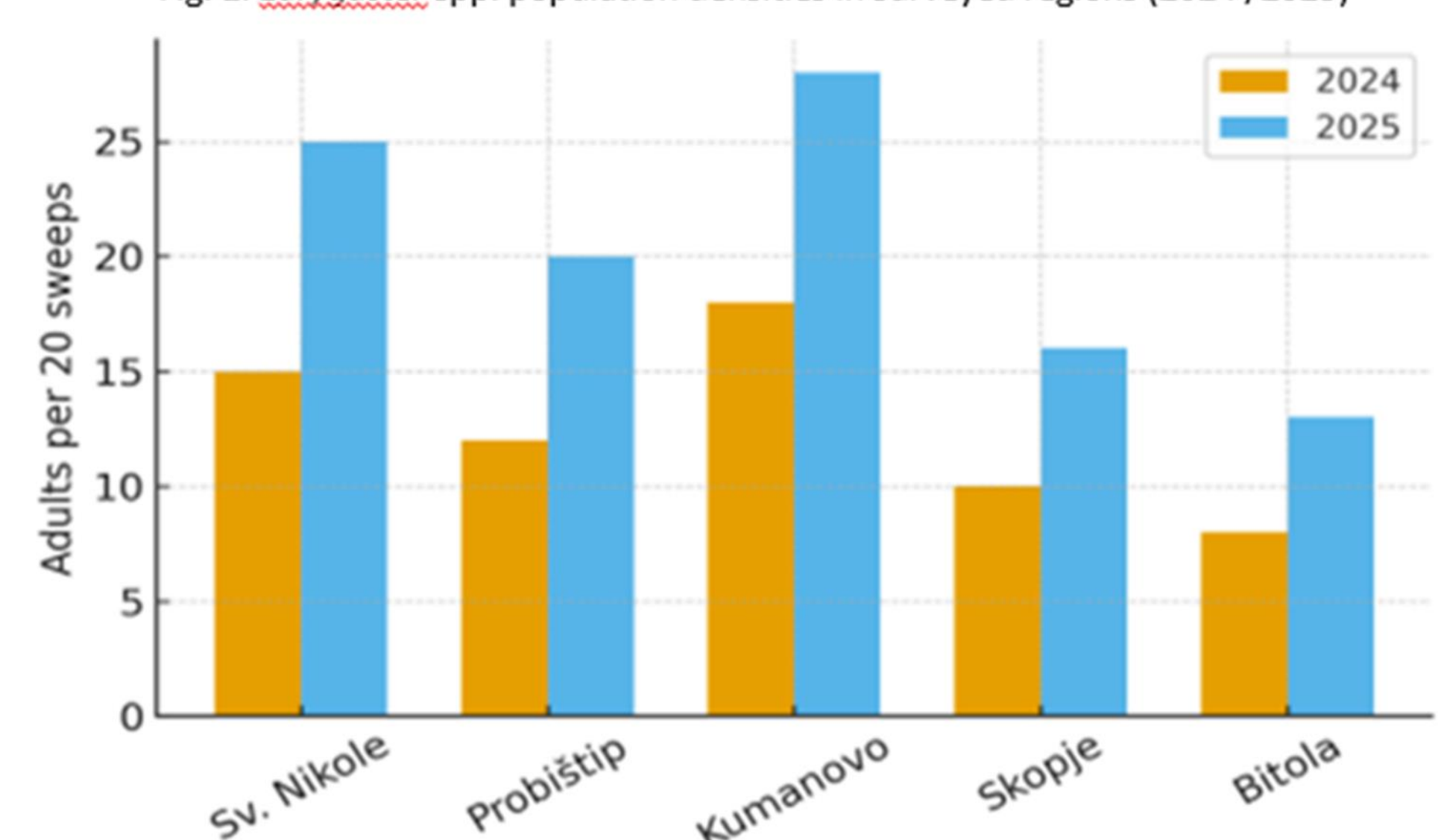
The 2025 growing season in North Macedonia was characterized by exceptionally high *Eurygaster* populations in May, followed by a sharp decline in June. Climatic factors, particularly elevated spring temperatures, played a decisive role in shaping this pattern. These findings highlight the importance of timely monitoring, forecasting, and adaptive IPM strategies. Such approaches can minimize unnecessary pesticide applications while protecting wheat yield and quality. Given the expected increase in climate variability, strengthening pest surveillance systems will be essential for sustainable cereal production.

### RESULTS

#### Early-Season Abundance

In May, *Eurygaster* adults were abundant across all regions (Table 1). Densities were over 50% higher than in 2024, especially in Sv. Nikole and Kumanovo (Fig. 1). Adults fed mainly on flag leaves and spikes.

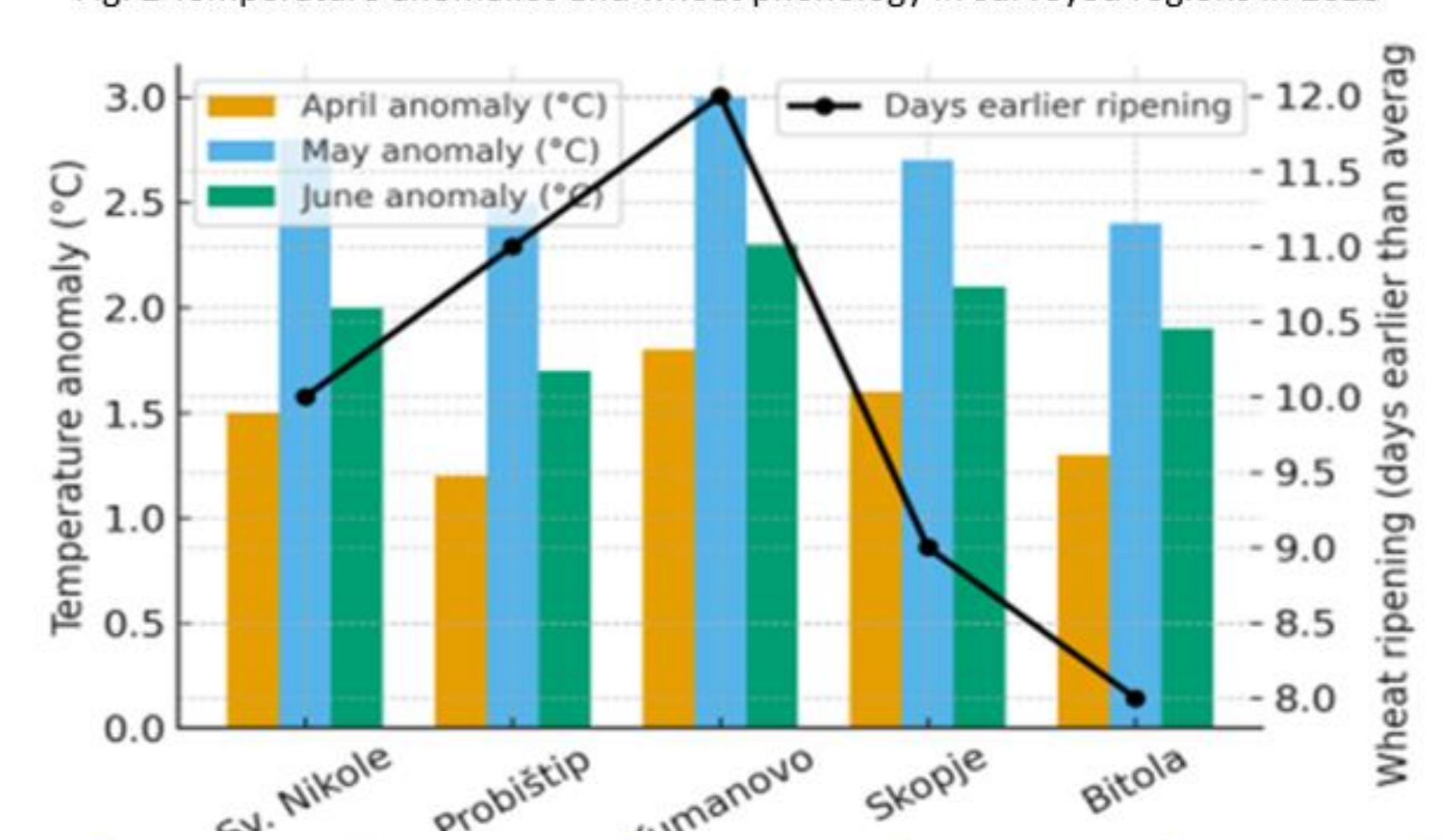
Fig. 1. *Eurygaster* spp. population densities in surveyed regions (2024 /2025)



#### Climatic Influence

Spring 2025 temperatures were 2–3 °C above the 10-year average, and wheat ripened 10–12 days earlier than usual (Fig. 2). Low May precipitation followed by early June rains likely accelerated pest migration and limited food availability.

Fig. 2 Temperature anomalies and wheat phenology in surveyed regions in 2025



#### IPM Recommendations:

- Monitor adults early for timely interventions.
- Use forecasting models incorporating temperature anomalies.
- Apply targeted control, e.g., selective insecticide use only if thresholds are exceeded.
- Emphasize non-chemical measures: adjust sowing dates, use tolerant varieties, and conserve natural enemies.