

## INTERACTIONS BETWEEN BUGS' FEEDING AND WHEAT QUALITY

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*Sunn pest, Triticum aestivum, bread-making quality, sodium dodecyl sulfate-polyacrylamide gel electrophoresis, western blot*

Several species belonging to the genera *Aelia* (Heteroptera: Pentatomidae) and *Eurygaster* (Heteroptera: Scutelleridae), known also as sunn pests or cereal bugs, have long been recognized as detrimental to wheat, *Triticum aestivum* L. In particular, *E. maura* (L.) and *E. austriaca* (Schrank) are considered the most noxious pests in western Europe. Sunn pests feed on wheat, piercing stems, leaves, and ears: with early attacks during crop life cycle, they can cause serious economic losses related to a decrease in grain yield, mainly due to losses in kernel weight, while later attacks during the grain filling period can cause a reduction in baking quality, the maximum damage occurring with sunn pest feeding at the late milk-ripe stage. In the United States also the green stink bug *Nezara viridula* (L.) (Heteroptera: Pentatomidae) is responsible of reductions in germination, kernel weight, and kernel texture even when milk stage kernels are infested with few individuals. In the present work, six different species of bugs collected in wheat fields in Piedmont were tested for their capacity to induce damage to wheat. In addition, the possibility to develop a rapid diagnostic method to detect residual bug salivary proteins in wheat kernels using biochemical markers was investigated. The study was conducted according to a completely randomized experimental design with six treatments [*E. maura*, *E. austriaca*, *Ae. acuminata* (L.), *N. viridula*, *Carpocoris* sp., and control without insects], two wheat cultivars (Bologna and Aubusson) and five replications, in two growing seasons (2008-09 and 2009-10). At maturity, the following analyses were performed on the harvested material: thousand kernel weight, damaged kernels (i.e., the percentage of seeds showing, at visual inspection, the typical discoloured area around the point of bug stylet penetration), protein content, hardness, sodium dodecyl sulfate sedimentation volume, specific sedimentation volume. For the biochemical analyses, single seeds damaged by each bug were crushed and incubated with extraction buffer (66 mM Tris HCl pH 6.8, 2.2% SDS, 10% glycerol, 5% 2-mercaptoethanol) for 1h at room temperature and 5 min at 95°C. The extract was separated by SDS-PAGE (12.5%) and then blotted on PVDF transfer membrane. After blocking in skim milk (diluted in PBS/Tween 0.2%), the membrane was incubated with primary antiserum against *E. maura* salivary glands diluted 1:1000 in skim milk and incubated with secondary antiserum diluted 1:5000 for 2.5h. The bug proteins were detected with diaminobenzidine tablets. In both growing seasons, the heaviest quality depletion was caused by *E. maura* whereas no detrimental effects were observed for *N. viridula*. The western blotting analysis was effective in the detection of damage from *E. maura* and can be the basis for the development of a rapid diagnostic method to identify damaged wheat stocks.

The research was partly funded by Regione Piemonte (research project QUALICHAIN) and Provincia di Torino.