Sensory impact of earwigs and their faeces on Chasselas and Pinot noir

**Introduction**

The abundance of the European earwig *Forficula auricularia* L. (Dermaptera, Forficulidae) in European vineyards increased considerably over the last few years. They are suspected to affect the human perception of wines both directly by their processing with the grapes and indirectly by the contamination of grape clusters with their faeces. In this study we artificially contaminated grapes with *F. auricularia* adults and/or their faeces and determined their impact on the aroma and taste of white 'Chasselas' and red 'Pinot noir' wines.

**Materiel & Methods**

**Chasselas** wines

- **Modalities:** harvested Chasselas grapes were contaminated with
  a) 5 earwigs/kg grapes,
  b) 0.6 g faeces/kg grapes,
  c) 5 earwigs along with 0.6 g faeces/kg grapes,
  0\(_w\) neither earwigs nor faeces (= uncontaminated control).

**Pinot noir** wines

- **Modalities:** harvested Pinot noir grapes were contaminated with
  d) 5 earwigs/kg grapes,
  e) 10 earwigs/kg grapes,
  f) 20 earwigs/kg grapes,
  0\(_a\) no earwigs (= uncontaminated control).

Individual judges of both panels tasted wines in April 2010 in random orders and were uninformed of the tested products.

**Results**

**Chasselas**

- **The 2/5 tests**
  - No significant effect between the wine contaminated with earwigs only (a) and the uncontaminated control (0\(_w\)).
  - Panellists were able to discriminate wines contaminated with earwig faeces (= (b) and (c)) from the uncontaminated control (0\(_w\)).

**QDA**

- The first component clearly opposed wines contaminated with earwig faeces to wines processed without faeces, whereas the second principal component opposed wines processed with living earwig adults to wines without adults.

High agreement between the sensory profiles of the two panels (RV = 0.950).

**Pinot noir**

- **The 2/5 tests**
  - Uncontaminated control (0\(_a\)) NS from lowest earwig concentration (d).
  - Uncontaminated control (0\(_a\)) significantly different from the two highest earwig concentration of [= (e) and (f)].

**QDA**

- The first principal component opposed wines with increasing earwig population levels. The second principal component opposed the wine contaminated with 10 earwigs/kg grapes to the three other 'Pinot noir' wines.

Agreement between the sensory profiles of the two panels (RV = 0.804).

**Conclusion**

The threshold value of 5 to 10 earwigs/kg grapes is probably rarely attained in the moderately infested vineyards of Switzerland. It is therefore too early to reclassify the status of earwigs from a beneficial insect to a viticultural pest. Its actual status is probably somewhere in between. Wine-growers should rather monitor the evolution of European earwig population in their vineyards in order to anticipate future problems.