

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



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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.

CHASSELAS White wine

Materiel & Methods

PINOT NOIR Red wine

Modalities: harvested Chasselas grapes were contaminated with

- 5 earwigs/kg grapes,
- 0.6 g faeces/kg grapes,
- 5 earwigs along with 0.6 g faeces/kg grapes,
- 0_w) neither earwigs nor faeces (= uncontaminated control).

Modalities: harvested Pinot noir grapes were contaminated with

- 5 earwigs/kg grapes,
- 10 earwigs/kg grapes,
- 20 earwigs/kg grapes,
- 0_R) no earwigs (= uncontaminated control).

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

2 / 5 - binomial test 14 tasters
Profile - QDA With two panels (9 tasters and 10 tasters)

2 / 5 - binomial test 13 tasters
Profile - QDA With two panels (9 tasters and 10 tasters)

Results

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).

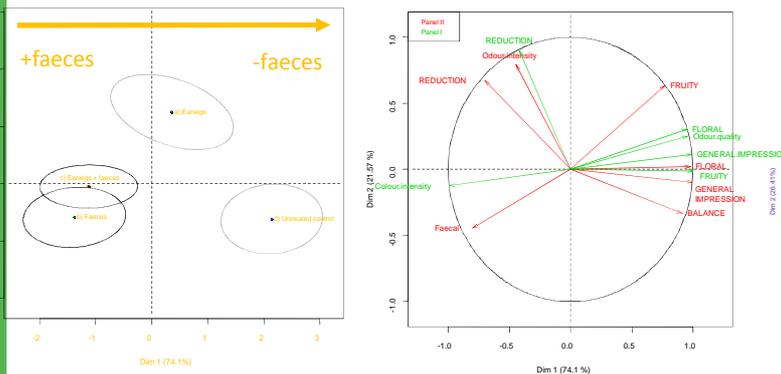


Figure: MFA plots of the four Chasselas. Capital letters = sensory descriptors that were assessed by both panel

- (0_w) Fruity, floral, balance ☺
- (b) & (c) Color intensity, reduction ☹



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

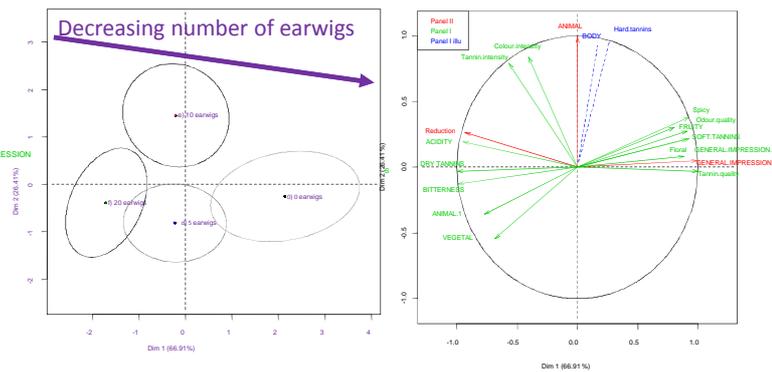


Figure: MFA plots of four Pinot noir. Capital letters = sensory descriptors that were assessed by both panel

- (0_R) Spicy, fruity, aroma quality, soft, floral, tannin quality ☺
- (d) Vegetal ☹
- (e) & (f) Reduction, acidity, dry tannins, bitterness animal and vegetal ☹



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.