

Fungicide residues in wine

With a total surface of approximately 7.5 million hectares, viticulture is a hugely important economic activity in geographical areas with warm climates. Grapevines are especially vulnerable to attacks by fungi; namely, gray mold, downy mildew, powdery mildew, anthracnose, and black rot. Such plant diseases may have devastating effects on grape productivity and quality, so vine growers endeavour to efficiently control these parasites, most commonly using chemical synthetic fungicides. If good agricultural practices are not met, such as correct fungicide dose and/or pre-harvest safety interval, grapes might be contaminated with unacceptable levels of fungicide.

Despite surveys concerning the presence of chemical residue in wine are highly appreciated by consumers as well as regulatory bodies and even wineries, up to now, studies of this kind have usually been circumscribed to particular producing regions or countries. Exceptionally, PAN Europe carried out, in 2008, a study with wines from 8 countries, and they found that most samples contained between 3 and 6 different pesticide residues. In the present study, the authors monitored the presence of several relevant fungicides in wines from diverse world regions.

In order to determine multiple pesticide residues in wines, chromatography-based methods are commonly chosen. These separative methods are endowed with high sensitivity and selectivity; however, laborious sample manipulation steps are usually required, which increase analysis time and cost. Also, antibody-based assays have been occasionally employed. The main advantages of immunoassays over chromatographic methods are simplicity, high sample throughput, and portability, making them an attractive alternative for extensive monitoring programmes focused on particular analytical targets.

Azoxystrobin, boscalid, cyprodinil, fenhexamid, and pyrimethanil are new-generation fungicides extensively employed in vineyards worldwide. Owing to their physico-chemical characteristics, residues of these compounds on grapes can reach must and wine. By taking advantage of the remarkable features of immunochemical methods for the cost-effective and rapid screening of particular analytes in foodstuff, a multiresidue survey on the presence of those five fungicides in bottled wines from all over the world was carried out. Commercial wines of different geographical areas and characteristics, including wine type, country of origin, protected designation of origin, grape variety, alcoholic grade, and price, were included in the survey. Our results are in line with those from other authors, evidencing that contamination of conventional wines with pesticide residues is an issue of global significance, even though the incidence seems to differ among geographical areas. Although the contamination levels that are commonly found should not raise serious toxicological concerns among consumers, farmers and wine-makers should make additional efforts to implement quality control procedures and innovative technological processes aimed at keeping to a minimum the presence of pesticide residues in wines. Since long ago, some authors as well as consumer organizations and professional associations are stressing the need to legislate on specific and more restrictive maximum residue limits for pesticide residues in wine. Likewise, limits to the total pesticide residue contents in wines need to be regulated. Consumers

perceive wines as a high value-added commodity which should meet the uppermost quality standards, so preventive measures and reliable analytical methods, such as immunoassays and chromatographic techniques, may certainly complement each other in order to achieve this goal.

Publication

[Fungicide multiresidue monitoring in international wines by immunoassays.](#)

Esteve-Turrillas FA, Agulló C, Abad-Somovilla A, Mercader JV, Abad-Fuentes A.

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