BACK TO SCHOOL 2019: EXCELL 5 LATEST NEWS

NEW VOLATILE THIOLS PACKAGE 1

Since Sauvignon varietal aromas have been highlighted by Tominaga & al. in the mid' 90s, volatile thiols assay (4-MMP, 3-MH & A-3MH) has always been a SARCO speciality. White wines varietal aromas knowledge (and especially about volatile thiols) has since been expanded and their presence is today also present in some red wines & beers.

Today equipped with new advanced technologies and fine chemistry high skills, **EXCELL has dedicated the last months to develop a new thiols package.**
Our team is now able to quantify several other volatile thiols as 4-MMPOH (citrus notes) which is 4-MMP (boxwood) alcohol or Furfurylthiol (compound highlighted through Louis Blanchard thesis at ISVV).

This expanded scope provides the opportunity to cover different grape varieties and to describe aromatic profiles and typicity of various white wines but also red ones. Furthermore, these analyses are relevant in breweries as well in order to manage production process towards very typical product objectives.
Upstream, an assay method targeting 3MH glutathione and cysteinyl precursors is still available in the laboratory.

New EXCELL LCMSMS thiols package contains the following compounds:

Molecule	Descriptor	Organoleptic threshold (wine)
4-methyl-4mercaptopentan-2-one (4MMP)	Boxwood, broom	0.8 ng/l
3-mercaptohexylacetate (3MHA)	Broom, passion fruit	4 ng/l
3-mercaptohexan-1-ol (3MH)	Grapefruit, passion fruit	60 ng/l
4-methyl-4mercaptopentan-2-ol (4MMPOH)	Citrus zest	55 ng/l
2-furanmethanethiol (2FT)	Coffee	0.4 ng/l
Benzenemethanethiol (BMT)	Gun flit, smoky	0.3 ng/l
Necessary volume for analysis: 500 ml; Delay: 7 days		

2 NEW ESTERS PACKAGE

Molecule	Descriptor	Organoleptic threshold (wine)
Isopropyl acetate	Banana	30 µg/L
Ethyl propionate	Ripe strawberry, solvent	2 100 µg/L
Ethyl isobutyrate	Strawberry, kiwi, fruity, solvent	15 µg/L
Isobutyl acetate	Solvent, fruity	1 600 µg/L
Ethyl butyrate	Ripe kiwi, strawberry kiwi, cheese	20 µg/L
Ethyl 2 methyl butyrate	Fruity, kiwi	18 µg/L
Ethyl isovalerate	Cheese, fruity	3 µg/L
Isoamyl acetate	Banana, sweet	1 100 µg/L
Ethyl valerate	Fruity	nc
Ethyl hexanoate	Pineapple, fruit, apple	14 µg/L
Hexyl acetate	Fruity, pear	1830 µg/L
Ethyl octanoate	Apple skin, fruity, waxy	580 µg/L
Octyl acetate	Waxy, fruity	800 µg/L
Ethyl 3 hydroxy butyrate	Fruity, strawberry	1 800 µg/L
Ethyl 2 hydroxy hexanoate	Blackberry	2 400 µg/L
Ethyl levulinate	Strawberry, apple	350 µg/L
Ethyl decanoate	Waxy, soapy, fruity	200 µg/L
Methyl salycilate	Camphor, fresh	40 µg/L
Ethyl salycilate	Camphor, medicinal	40 µg/L
Acetate phenyl ethyle	Floral, rose, honey	250 µg/L
Ethyl dodecanoate	Waxy, soapy	800 µg/L
Phenyl ethyl alcohol	Rose	14 000 µg/L
Ethyl 6 hydroxy hexanoate	Fruity	1 200 µg/L
Necessary volume for analysis: 100ml; Delay: 7 days		

Esters play a key role in wines aromatic identity; many studies have been managed in different universities all over the world on this point. **This work has allowed to expand the scope of involved molecules.**

Then, to help you characterizing aromatic profile of your wines, we have updated our fermentation esters quantification offer by integrating new compounds and increasing detection sensitivity for some of them.

This protocol upgraded in GCMS now brings a better approach of esters aromatic synergistic effects.

**Although 2-Phenylethanol is not an ester but an alcohol, we propose it in this analytical offer. Its floral descriptors interacting with several other compounds present in our "esters" package.*

FRESHNESS PACKAGE 3

Climate change and customers expectations unfortunately don't move in the same direction. As each summer gets hotter and favourable for important maturities, customers are currently waiting for more and more fresh and tense wines. **Freshness perception can be increased by delicate minty and liquorice flavours in red wines but also some white ones** (Sémillon, Chenin, Petit or Gros Manseng, Roussane, Marsanne…).

Compounds involved in this perception are henceforth well-known through Xavier Poitou & Magali Picard thesis.

Helped by GC-MSMS technology, we have developed a freshness pack clustering all these compounds.

This pack can be used for:

- **Qualifying a grape harvest**: some of our partners have even linked freshness molecules to MND (3-Methyl-2,4-nonanedione, prune aroma).
- **Controlling wine-making**:
  - o Adjust temperatures and maceration
  - o Finalise blending and press wines usage.
  - o Manage wine aging

Molecule	Descriptor	Organoleptic threshold (wine)
Limonene	Citruses	10 µg/L
Menthone	Peppermint	170 µg/L
Menthol	Peppermint	300µg/L
Pulegone	Peppermint	10 - 1 000 µg/L
Carvone	Minty, liquorice	50 µg/L
Mintlactone	Spearmint	100 ng/L à 10 µg/L
Eucalyptol - 1,8-Cineol	Minty, fresh, herbaceous	1,1 µg/L
Piperitone	Herbaceous, minty, camphor	30,2 µg/L
IPMP	Green peas, earthy	2 ng/L
IBMP	Green pepper	15 ng/L
4-heptenol	Vegetal	13 µg/L
Ethyle Salicylate	Camphor, fresh	40 µg/L
Methyle Salicylate	Camphor, medicinal	40 µg/L
Ethyle Benzoate	Fruity, minty	575 µg/L
Safranal	Spicy, green	3 µg/L
cis-hexenol	Vegetal, herbaceous	400 µg/L
trans-hexenol	Vegetal, herbaceous	400 µg/L
n-hexanol	Cut grass	0,5 mg/L
Necessary volume for analysis: 200ml; Delay: 4 days		

4 ASTILBINE

In addition to aromatic topic previously handled, consumers are also looking for smoothness and volume on the palate. A compound recently discovered at Bordeaux ISVV called Astilbine seems to play a key role in this phenomenon. This compound is present at different levels in grape, in the skin but also in seeds and stems. We have developed a LCMSMS quantification method in order to evaluate grape potential, follow extraction & maceration process and if necessary, to manage harvest with stems. In this specific case, we associate quantification of Astilbine to freshness compounds previously described.

WHISKY PEATY AROMAS PACKAGE 5

Over the last months, our development work has also involved our whisky producer partners. Peaty whiskies present an aromatic typicity from peat, a plant and earth decomposing agglomerate used during grain malting.

Thus, thanks to our spirits team work, it is now possible to gather phenols & cresols compounds responsible for peaty aromas in this new pack. Our package allows us to define a peaty factor, particularly useful to qualify row materials, optimise blending and control aging in barrels.

Molecule	Descriptor	Organoleptic threshold (wine)
Phenol	Phenolic, medicinal, antiseptic	19,2 mg/L
o-Cresol	Phenolic	0,61 mg/L
p-Cresol	Phenolic, aromatic, lightly spicy	0,05 mg/L
m-Cresol	Phenolic	0,58 mg/L
Guaiacol	Smoky, medicinal, woody, bacon	0,04 mg/L
2-ethyl phenol	Phenolic	nc
4-ethyl phenol	Phenolic, aromatic, slightly spicy	0,47 mg/L
3,5 Xylénol	Coffee, balsamic	nc
4-ethyl guaiacol	Spicy, smoky	nc
Eugenol	Clove, spicy	nc
Necessary volume for analysis: 100ml; Delay: 7 days		

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