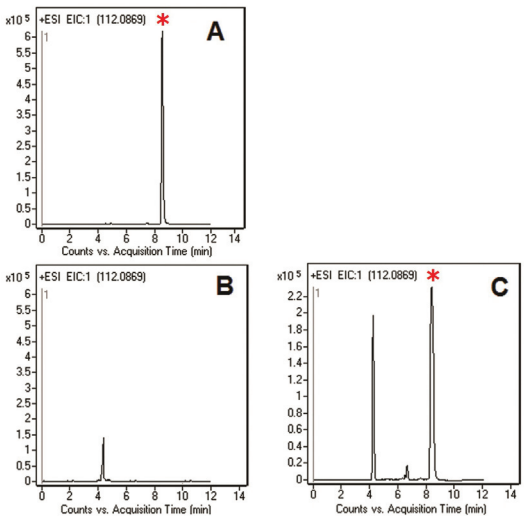
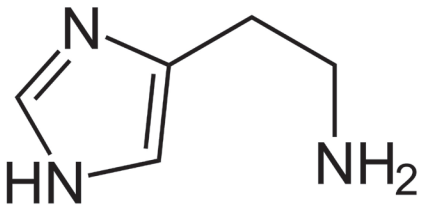
Histamine in Red and White Wine

LC-MS method without derivatization





Note: Histamine is known for its role in allergic response. Release of histamine plays a role in inflammation, gastric acid secretion, microcirculation and neurotransmission in mammalian brains. Measurement of histamine levels in body fluids has been used in clinical analysis in various diseases such as preeclampsia, asthma, cancer, mastocytosis and in the progression of periodontitis. Histamine is also present in many foods and beverages, especially red wine and spoiled food. Ingesting histamine can cause migraines, sweating and nausea.

Method Conditions

Column: **Cogent Diamond Hydride™**, 4µm, 100Å

Catalog No.: 70000-15P-2

Dimensions: 2.1 x 150 mm

Solvents: **A: 50%** DI H_2O / 50% 2-propanol / 0.1% formic acid
B: Acetonitrile / 0.1% formic acid

Gradient:

time (min.)	%B
0	80
5	10
7	10
8	80

Post Time: 5 min (can be reduced for standards)

Injection vol.: 1µL

Flow rate: 0.4 mL/min

Detection: ESI – POS - Agilent 6210 MSD TOF mass spectrometer

Figures/Peaks: **Fig. A:** Histamine standard. 1 mg/mL histamine dihydrochloride in DI H_2O / methanol 80:20. The solution was filtered through a 0.45µm filter (MicroSolv Tech Corp.). Sample for injection was diluted 1:100 with 50:50 solvent A:B mixture.
* = Histamine
Fig. B: White wine. The wine was filtered through a disposable 0.45µm filter (MicroSolv Tech Corp.) and injected as is. No histamine peak. Extra peak is from wine matrix.
Fig. C: Old red wine. The wine was filtered through a disposable 0.45µm filter (MicroSolv Tech Corp.). Sample for injection was diluted 1:5 with 50:50 solvent A:B mixture. * = Histamine
Extra peaks are from wine matrix.

t_0: 0.9 min

Discussion

The method for this analysis is simple, fast, robust, and does not require derivatization, which is the main advantage over other HPLC methods used in the assay of this polar compound.

It was demonstrated that histamine is not present in the white wine sample (see Fig. B). Sample preparation was minimal and involved just filtration using syringe filters. The sample of red wine contained histamine at a level that was determined to be below 10 mg/L (see Fig. C).

Owing to the advantages of the ANP method presented (simplicity, rapidity, cost-effective, etc.) it can be proposed as an important tool for histamine determination in wines and other food products.

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