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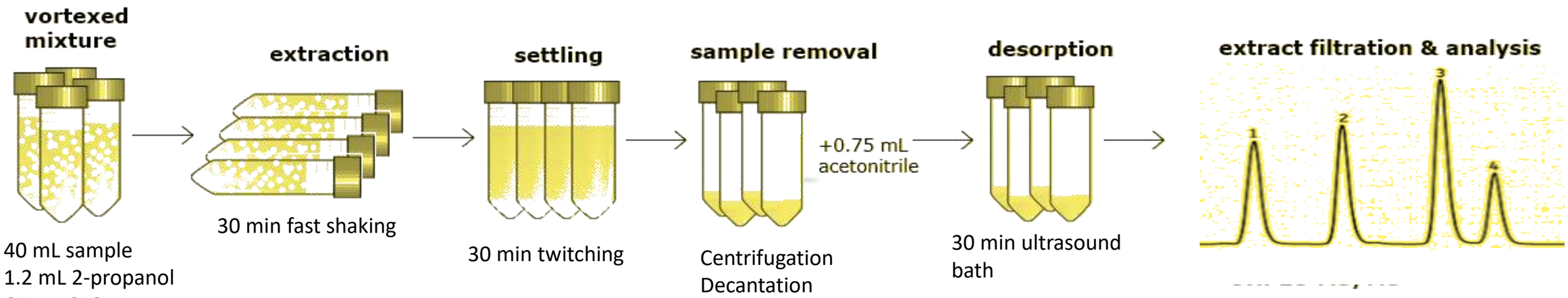
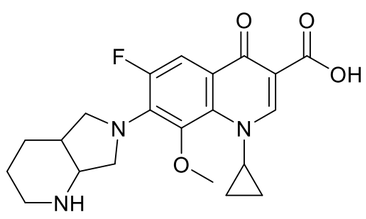
Simplified and fast analysis of selected pharmaceuticals with dispersive micro solid-phase extraction (DMSPE)

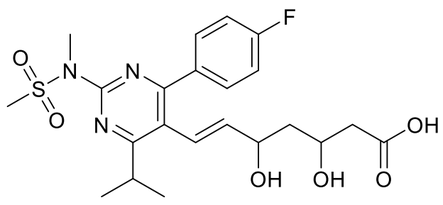


Binding of the analytes onto freely dispersed sorbent in the sample and their desorption afterwards.

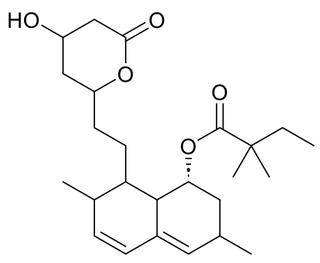
Unveiling practical aspects of DMSPE-HPLC-UV for analysis of 4 selected pharmaceuticals



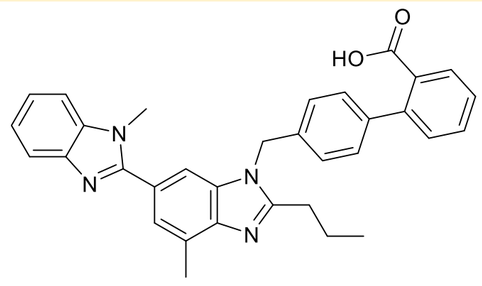
Moxifloxacin (MOX)



Rosuvastatin (ROS)



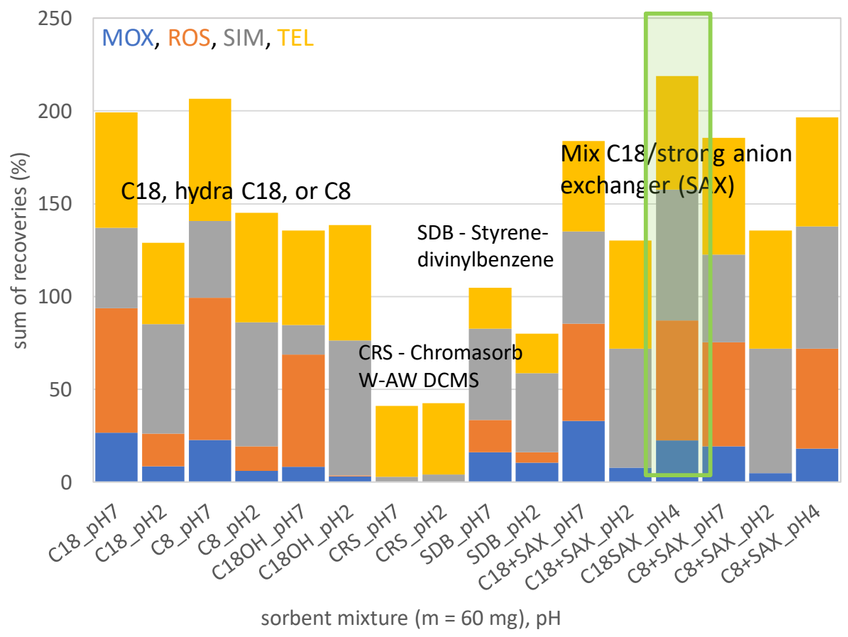
Simvastatin (SIM)



Telmisartan (TEL)

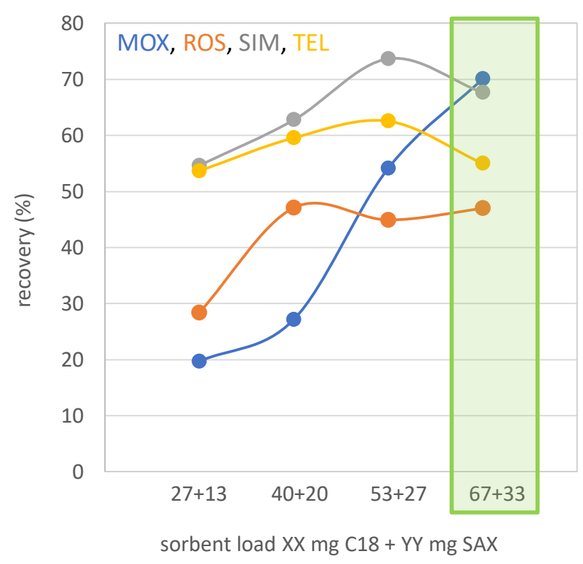
RESULTS

1) Sorbent screening



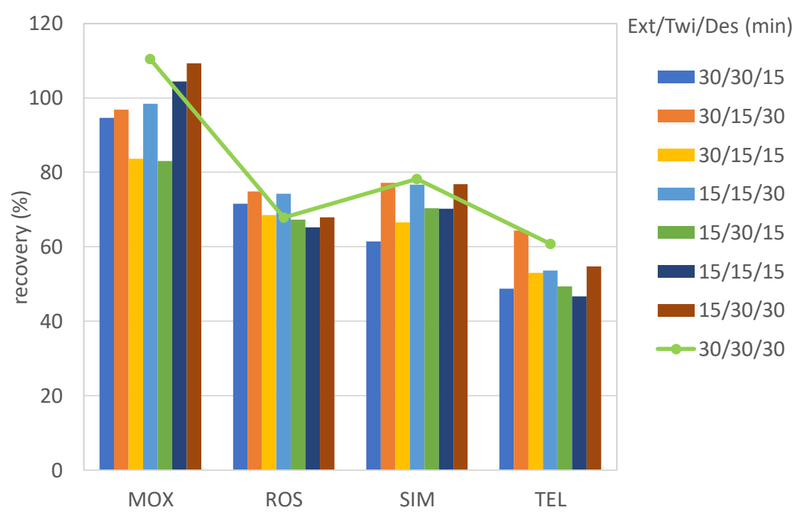
The C18 and C8 sorbents (pH 7) provided the higest recoveries. However, addition of SAX and creation of mixture C18/SAX even increased efficiency, especially at pH 4.

2) Sorbent load



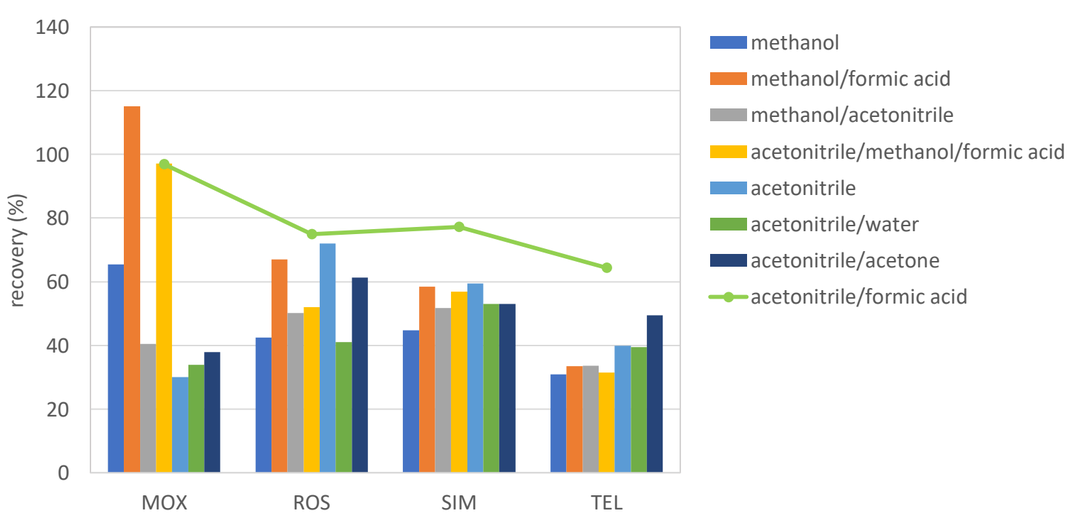
The higher the sorbent mass, the higher the recoveries. This is especially true for very polar MOX.

3) Time



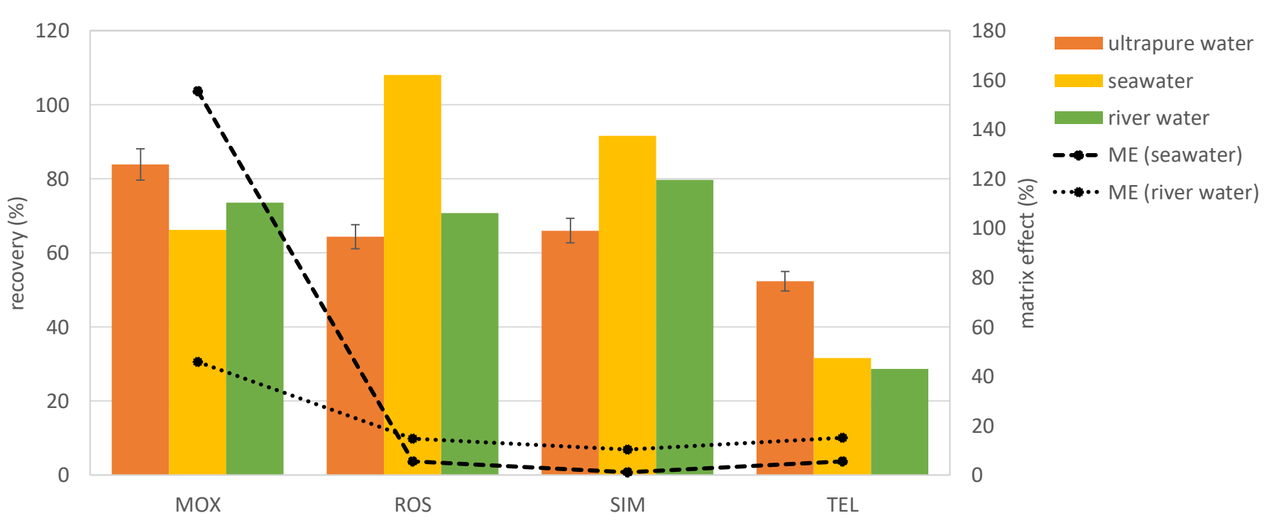
Prolonged extraction (30 min), twitching (30 min), and desorption (30 min) times were the most beneficary for extraction efficiency. However, in general no significant effects were observed.

4) Desorption solvent



Acidic conditions (by adding formic acid) were found the most important parameter in desorption regardless of the solvent. However, acidic acetonitrile finally provided the best compromise of recoveries compared to slightly less efficient acidic methanol.

5) Method performance



Optimized method had recoveries between 50 and 80% reaching > 25 preconcentration factors. Recoveries obtained in seawater/river water were different compared to ultrapure water suggesting the impact of the ionic strength. Repeatability was < 5% RSD. Matrix effects were below 20% except for MOX (the most polar & first-eluting analyte) that suffered up to 100% signal enhancement in seawater.

CONCLUSIONS

DMSPE-HPLC-UV is a promising & simple procedure with high multiplexing capacity.
It is applicable for fast extraction & preconcentration of analytes in water analysis.