

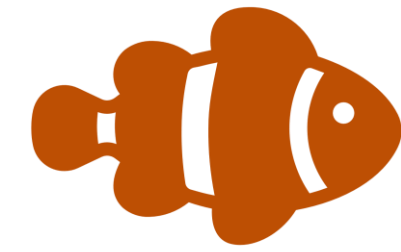
Silicone rubber extract method selection for passive sampling of emerging contaminants

Emerging pollutants in aquatic ecosystems

Why using silicone rubber as passive sampling devices?



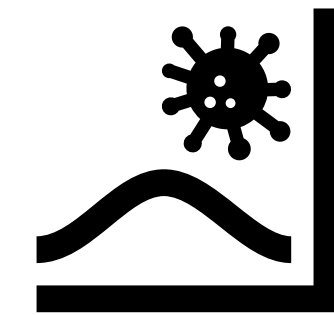
Measure aqueous concentrations of nonpolar contaminants ($\log K_{ow} > 4$)



Bioconcentration in organisms can be mimicked by passive sampling



Less affected by sudden variations in environmental concentrations



Integrated contaminant signal over a time period

Methods

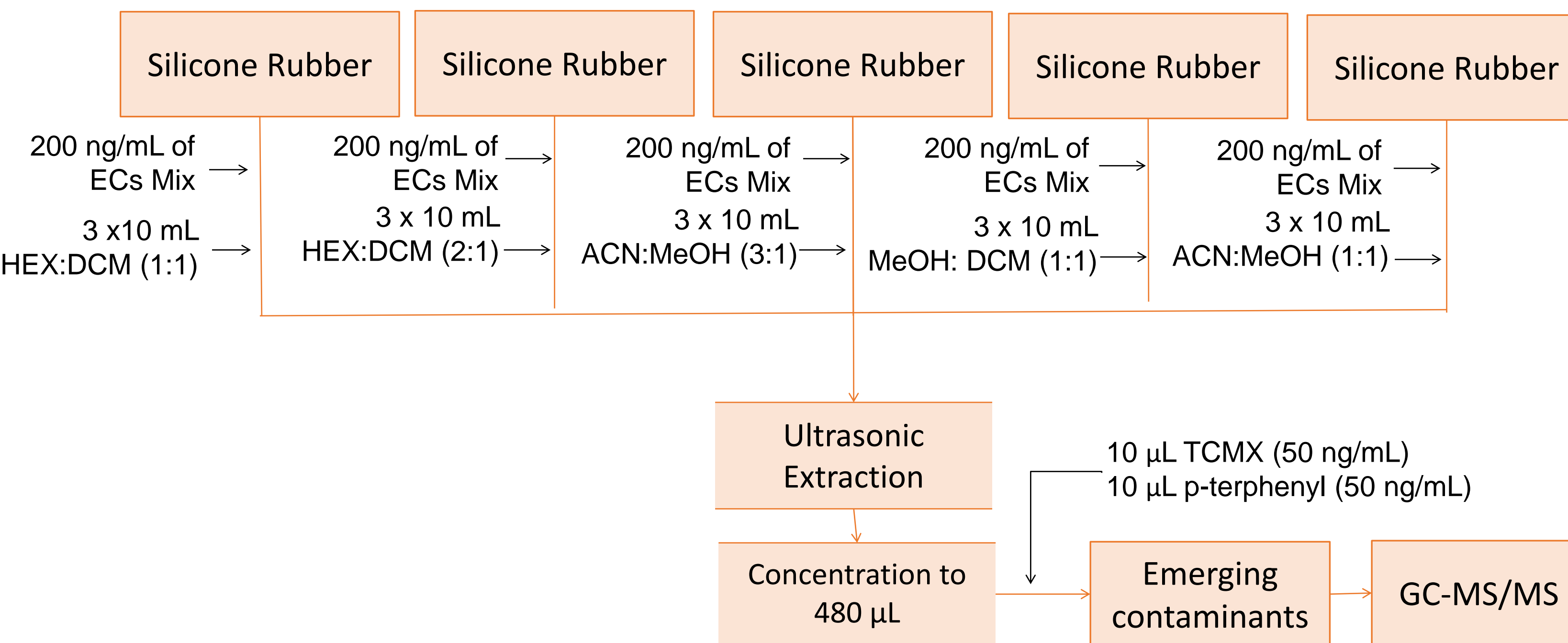


Fig. 1 - Flowchart of the methods used in present study. Mix ECs - Mix of tonalide, galaxolide, octocrylene, 4-MBC, and EHMC; HEX - Hexane, DCM - Dicloromethane, MeOH - Methanol, ACN - Acetonitrile; ACE - Ethyl Acetate GC/MS/MS - Gas chromatogram-tandem mass spectrometry.

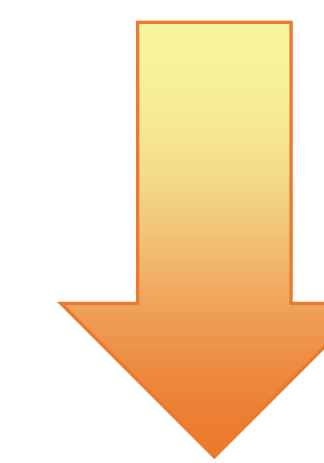
Results

Table 1 - Quantification data of the extractions. HEX - Hexane, DCM - Dicloromethane, MeOH - Methanol, ACN - Acetonitrile; ACE - Ethyl Acetate. HHCB - Galaxolide, AHTN - Tonalide, OCT - Octocrylene.

| | DCM:HEX (v:v, 1:1) | | DCM:HEX (v:v, 2:1) | | MeOH:DCM (v:v, 1:1) | | ACN:MeOH (v:v, 3:1) | | ACE:MeOH (v:v, 1:1) | |
|-------|--------------------|---------|--------------------|---------|---------------------|---------|---------------------|---------|---------------------|---------|
| | REC (%) | RSD (%) | REC (%) | RSD (%) | REC (%) | RSD (%) | REC (%) | RSD (%) | REC (%) | RSD (%) |
| HHCB | 50,0 | 12,0 | 122 | 12,3 | 66,4 | 5,70 | 68,7 | 9,70 | 58,0 | 6,60 |
| AHTN | 53,4 | 11,7 | 113 | 10,6 | 62,9 | 7,70 | 68,9 | 9,80 | 66,0 | 17,0 |
| 4-MBC | 50,4 | 11,5 | 128 | 12,5 | 64,3 | 10,6 | 60,6 | 14,4 | 64,0 | 7,40 |
| EHMC | 64,0 | 24,9 | 45,2 | 8,5 | 75,4 | 8,30 | 76,9 | 21,5 | 103 | 2,20 |
| OCT | 62,2 | 22,4 | 63,7 | 7,5 | 60,5 | 11,0 | 70,1 | 22,9 | 107 | 17,3 |



The best extractions were performed with DCM:HEX (2:1) and ACN:MeOH (3:1)



Those with less expressive results were performed with DCM:HEX (1:1), MeOH:DCM (1:1), and ACE:MeOH (1:1)

Conclusion

According to the data obtained, the solvent mixture that showed the best recoveries and lowest variations was the one composed of DCM:HEX (2:1; v:v).