Detecting UV-filters In Fish Tissue

Angel Hinojosa
Embry-Riddle Aeronautical University Worldwide
917crodriguez@gmail.com

Importance of UV Filters and Why Fish Tissue?

- The purpose of this Narrative Literature review is to explore consistency of methodology used in quantifying the specific UV filters in fish tissues when quantifying with GC-MS or LC-MS.
- UV Filters are widely known to be used in sunscreen products, hair sprays and moisturizers
- However, when bioaccumulate into large bodies of water, they can stick onto fish tissue
- Our narrative literature review focuses on specific UV Chemical Compounds found within Fish Tissue. Namely the following...
- Benzophenone-3, 4-methylbenzylidene camphor (4-MBC), octocrylene, ethylhexyl methoxycinnamate (EHMC) and homosalate
- Additionally, we looked to highlight the published GC-MS & LC-MS detection methodologies and determining the differences

Methods

- There are 4 things we specifically focused on
- Species Analyzed
- Sample Tissue Extraction
- Quantification
- Extraction Controls

Our findings Within The Literature

- A multitude of species were analyzed, among them included eel (Anguilla anguilla), snakehead (Channa Argus) and Common Carp (Cyprinus)
- Quantification varied, however most favored the use of GC-MS rather than LC-MS
- Sample Prep and Extraction varied; most studies utilized composite samples
- Some studies evaluated only fish muscle tissue (8, 18, 25, 30, 33, 35, 37)
- Others removed fat tissue (9,33), while others evaluated non-muscle tissues (4, 11, 19, 23, 36, 40)
- Sources can be found within the QR code

Key Takeaways

1. Species analyzed were diverse
2. Composite samples are shown to be best for accuracy
3. Fish Tissue extracted can be diverse
4. Majority of the studies utilized GC-MS over LC-MS
5. Recommendations include all the above

Acknowledgements & References

Table 1 *Reported measured values (ng/g lipids) of target chemicals detected in fish tissues (LOD = limit of detection)*

	BP-3	4-MBC	OCTOCRYLENE	EHMC	HOMOSALATE
			GC/MS		
Bachelot (2012)	-	-	<LOD - 7112	3 - 256	-
Buser (2005)	-	73 - 166	-	-	-
Cunha (2018)	<LOD - 55.72	5.0 - 14.09	< LOD - 66.6	<LOD - 32.7	<LOD - 22.1
Emnet (2015)	<LOD - 14.1	-	-	-	-
Fent (2010)	<LOD - 151	-	-	<LOD - 701	-
Langford (2015)	<LOD - 1037	-	<LOD - 11875	<LOD - 36.9	-
Mottaleb (2009)	37 - 90	-	-	-	-
Negreira (2013)	<LOD	<LOD	15 - 20	<LOD	<LOD
Petrarca (2022)	<LOD	-	-	<LOD - 10.6	-
Picot Groz (2014)	-	-	* - 3992	* - 1765	-
Sang (2016)	<LOD - 10.3	<LOD	<LOD - 11.6	<LOD - 51.3	-
Subedi (2011)	<LOD	<LOD	<LOD	-	-
Tang (2019)	<LOD - 100	<LOD - 16.2	<LOD - 13.7	<LOD - 41.2	<LOD - 11.0
Tsai (2014)	3.3 - 6.9	-	-	-	<LOD - 0.7
Zenker (2008)	<LOD	<LOD	-	4 - 142	-