



Safety
Quality
Traceability

Arsenic speciation in food

Zdenka Šlejkovec
Ingrid Falnoga



Why arsenic speciation? Toxicity!

Compound	LD ₅₀ mice (g/kg)	LD ₅₀ man (g/kg)	LDL ₀ man (g/kg)
As ₂ O ₃	0.03	0.0015	
As ₂ O ₅			0.005
TETRA	0.89		
DMA	1.2		0.5
MA	1.8		0.05
AC	6.5		
TMAO	10.6		
AsB	> 10		

120 mg/80kg



Arsenic in food – known problems



	major compounds	toxicity
Water	inorganic As (3+/5+)	high
Seafood	arsenobetaine	low
Algae	arsenosugars	unknown
Rice	inorganic As and DMA	high

How does arsenic come into food?

- **Food of terrestrial origin**

- low uptake of As into plants
- biomethylation or its absence
- transfer to animals used as food

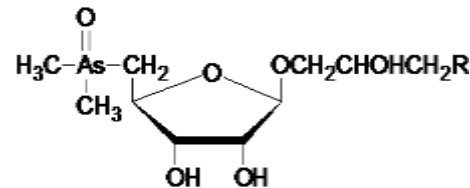
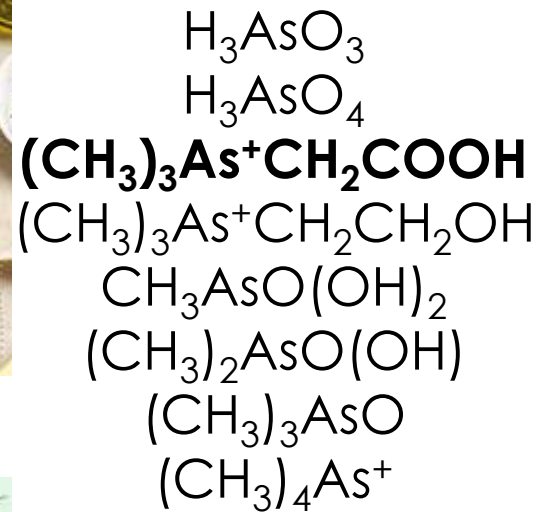
 mainly inorganic As expected – higher toxicity at low concentrations

- **Food of aquatic origin**

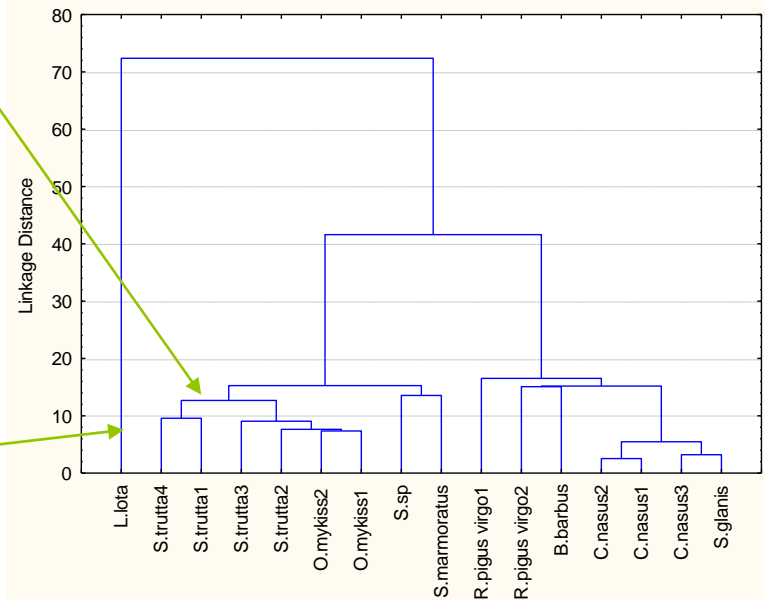
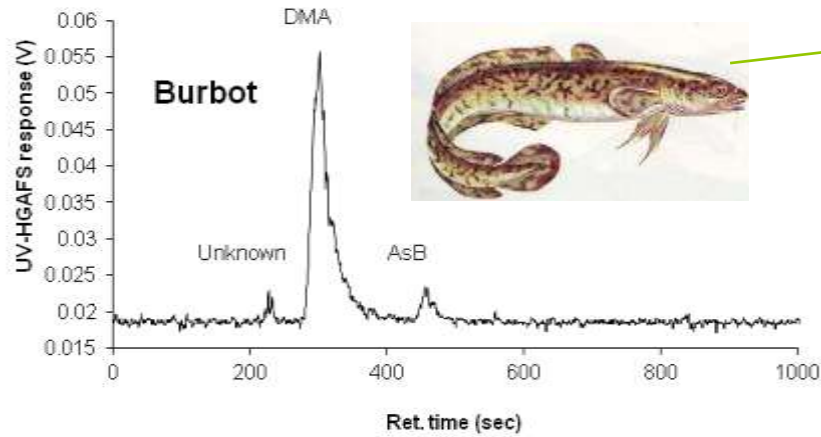
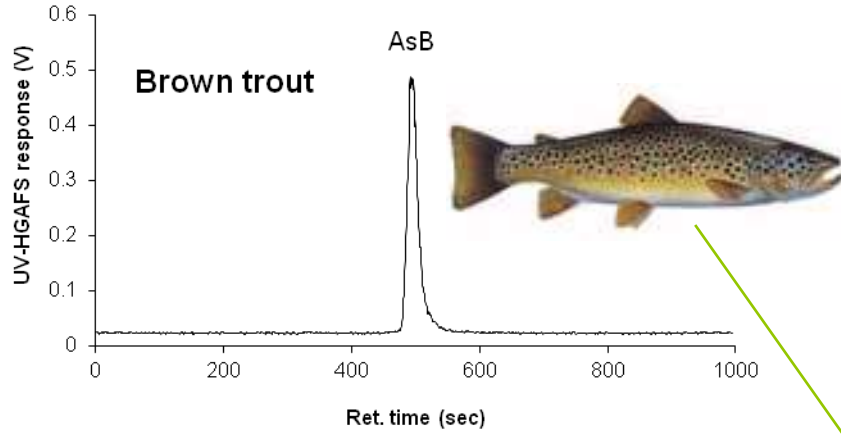
- efficient uptake of As and its transfer via the food chain
- biotransformation of inorganic arsenic into compounds with different toxicity

 origin of arsenobetaine (low toxicity) still unknown

Food control



Genetics



Open questions

- Origin of arsenobetaine – connection to seafood?
- Contaminated areas in Slovenia (Kotredeščica, Mežica, Celje) – potential transfer of As to cow milk?
- Arsenic in relation to antimony and selenium - interactions and increased or decreased toxicity?