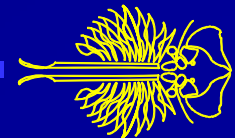


Results of a questionnaire on rotifer culture methods and protocols currently used in European hatcheries

EU funded project: Genetic implications in the production of rotifers in commercial finfish hatcheries (Q5RS-2002-01302)

Rotifer workshop: 9 September 2005
Ghent University



Project partners:

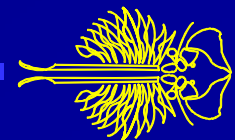
Laboratory for Aquaculture & Artemia Reference Center
Ghent University, Belgium

Sea Fisheries Department, Ministry of Agriculture, Ostend,
Belgium

Department of Genetics, Development and Molecular Biology
Aristotle University of Thessaloniki, Greece

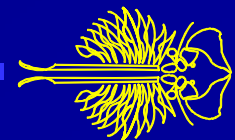
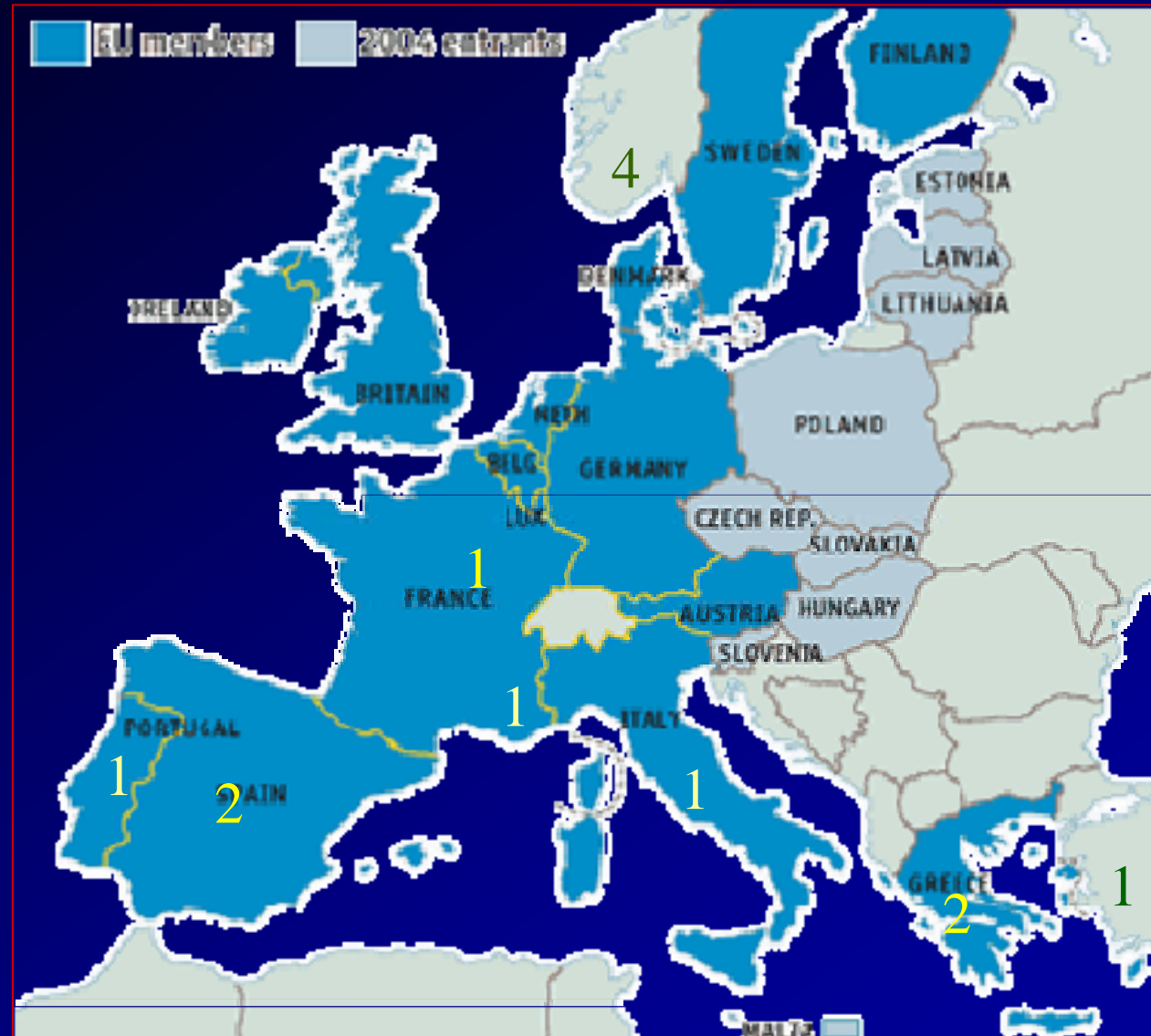
Norwegian University of Science and Technology, Trondheim,
Norway

Maricoltura di Rosignano Solvay srl, Livorno, Italy

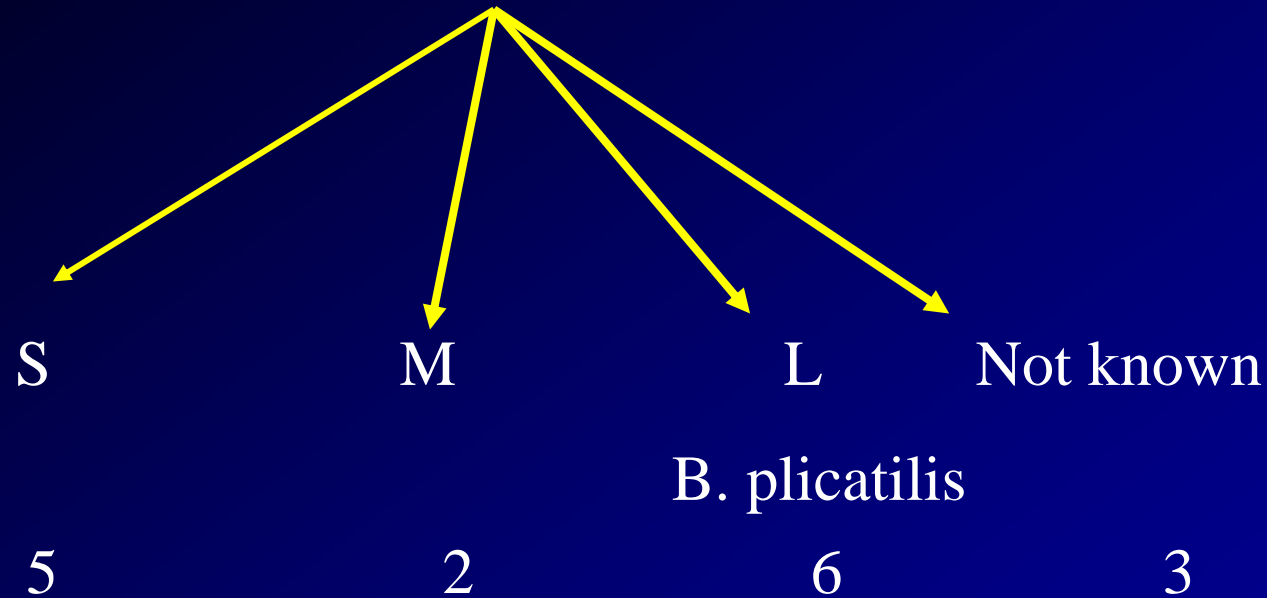


Location of the participating hatcheries

13 hatcheries
17 rotifer stock cultures



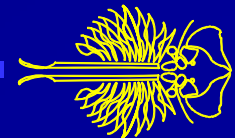
Which rotifer type are you using?



1 hatchery: ?

10 hatcheries: 1 rotifer stock culture

2 hatcheries: more than 1 stock culture (2 or 4 stock cultures)



Origin of the rotifers cultured in the hatchery ?

Unknown: 7

Known: 10

Institute: 3

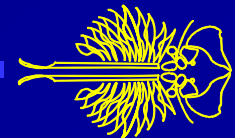
Other hatchery: 3

Place: USA: 1

France: 2

U.K.: 1

→ Transport of rotifer starters



Maintenance of stock cultures during the fish larvae production

All hatcheries except 1

Maintenance of stock cultures outside the fish larvae production

No: 3

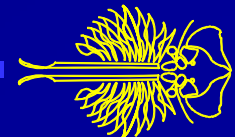
Yes: 10



Source at the start of the new season:

- other commercial farm
- buy from a company
- own resting eggs

1 hatchery: mass production year round



Stock cultures

Feed:

All hatcheries feed algae or a mix of algae.

species: *Tetraselmis* (1), *Nannochloropsis* (3), *Chlorella* (2), *Isochrysis* (1)

1 hatchery: mix of algae, yeast, vitamins, oil

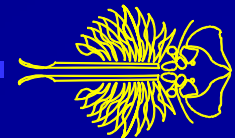
Oxygen:

Aeration: YES : filtered air (4)

NO : (8)

Rotating (4)

Shaking (4)

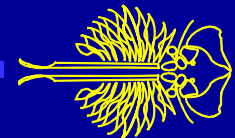


Mass cultures

Feed: 8 hatcheries apply mixtures of feeds
5 hatcheries apply artificial diets

Mixtures: - Nanno/Chlor. **paste** (Reed Mariculture), fresh baker yeast, emulsified oil (Rich), Vit.
- Nanno **paste** (Reed Mariculture), ROCULT (Dana Feed), Culture Selco 3000 (INVE), fresh baker yeast, emulsified oil (Marol E)
- Nanno/ Chlor. **paste**, dry baker yeast (rarely)
- Chlor. **paste**, **fresh algae**
- **Fresh algae**, dry yeast (2)
- **Fresh algae**, DHA prot Selco, fresh baker yeast
- Dry feed (Algamac 2000), fresh baker yeast

Artificial diets: - Culture Selco 3000 (INVE) (3)
- Culture Selco 3000 + Culture Selco Plus (INVE)
- ROCULT (Dana Feed)



Mass cultures

Feeding method:

Manually: 8 hatcheries

Mixture: 3
Artificial diet: 5



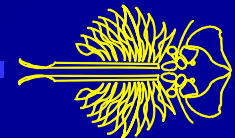
Continuously: 6 hatcheries

Mixture: 5
Artificial diet: 1



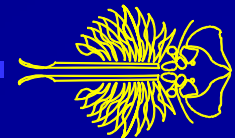
Culture type:

- Batch culture: 7
 - 3 days culture period (5)
 - 3-4 days (1)
 - 10 days (1)
- Semi-continuous: 3
- Continuous: 2
- Recirculation: 2



Suspected reasons for crashes

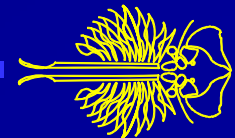
Human error:	11
Ciliates:	7
Bacteria:	5
Oxygen:	5
Floccules:	2
Ammonia:	2
Change of feed-feeding regime:	2
Season related:	2
Feed type:	1
Fresh water:	1
Virus detected in rotifer culture	1



Number of crashes/year

Crash	Number of hatcheries
< 2	8
2-10	2
> 10	3

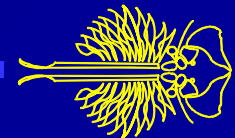
No relation between size of hatchery and number of crashes



Link between genotype and number of crashes?

Crash	< 2	2-10	> 10
Genotype			
B. plicatilis s.s.		1	1
Austria		1	
Cayman	5		
Nevada	2		
Mix Nevada-Cayman			1
Mix plicatilis-Cayman-Manjavacas			1

All Cayman cultures are situated in the Mediterranean.



Mass cultures

Feeding method:

Manually: 8 hatcheries

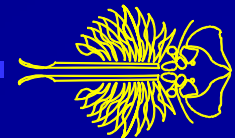
Continuously: 6 hatcheries

Mixture: 3
Artificial diet: 5

Mixture: 5
Artificial diet: 1

Crash /year	Mixture	Art. diet
< 2	2	3
2-10	0	0
> 10	1	2

Crash /year	Mixture	Art. diet
< 2	4	0
2-10	1	0
> 10	0	1



Conclusion:

Too few data to point out a reason for crashes
Most probably a multi-factorial problem

