

UPDATE ON FISH DISEASE SITUATION IN THE MEDITERRANEAN BASIN 2016

*Annual Workshop of the National Reference
Laboratories*

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PRODUCTION VOLUMES

TOTAL PRODUCTION	YEAR										
COUNTRY	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
TURKEY	114.206	124.530	136.573	149.589	155.802	164.197	187.136	210.824	231.672	232.152	234.000
GREECE	90.958	115.392	130.872	148.509	138.513	122.590	111.217	116.073	125.580	115.580	112.159
SPAIN	52.685	61.862	62293	65.835	69866	63.200	61.992	59.920	55.694	59.356	64.186
ITALY	62.258	62.534	63.815	64.073	65137	64.382	64.781	58.100	57.590	57.990	55.480
FRANCE	48.908	50.987	49491	47110	45.954	44.342	45.980	44.540	40.205	41.641	44.521
CROATIA	6.699	7.343	6.913	7653	9946	9823	10681	8.822	8.512	10.201	12.093
PORTUGAL	4166	4367	4.274	4024	4.097	4.674	5130	7000	3.635	5.760	5.919
SLOVENIA	1145	1206	1051	1091	995	701	958	842	897	1020	1029
BOSNIA	7010	7551	7358	7502	7550	7550	4920	3586	2874	3357	4451
SERBIA	0.	4835	6609	7534	7440	8155	7629	7662	5936	7168	7387
Albania	613	697	729	1043	1059	1086	722	1274	1290	924	1300
Macedonia	843	588	1041	1287	1540	1491	1368	1306	1340	1 214	991
Marocco	2014	921	1274	394	425	447	402	449	710	887	761
Algeria	358	272	361	2775	2159	1755	2240	2641	2189	2380	1 325
Tunisia	2483	2 676	3097	3432	4747	5256	7965	8462	12071	11123	14 263
Israele	22408	22117	21434	20017	19177	19895	20817	20342	22252	20166	20 855
Giordania	561	560	509	540	440	541	575	600	720	885	885
Libano	803	803	803	955	1055	1155	1255	1255	1255	1115	1115
Siria	8533	8902	8425	8595	8697	8610	7500	6200	4000	3000	2500
Egypt	536450	594717	635429	693684	705290	918 793	986054	1016629	1091688	1129856	1174819
CYPRUS	2.118	2.552	2.229	2452	3.343	4.118	4.665	4.313	6.171	4.810	5.409
Montenegro	0.	184	211	414	355	590	640	630	630	680	624
MALTA	736	1936	2716	2702	2868	2916	2127	4336	5266	4917	5 913
Lybya	241	240	240	10	10	10	10	10	10	10	10
Grand Total	966.196	1.075.096	1.147.747	1.241.220	1.256.465	537.484	1.536.764	1.585.816	1.682.187	1.714.978	1.729.639

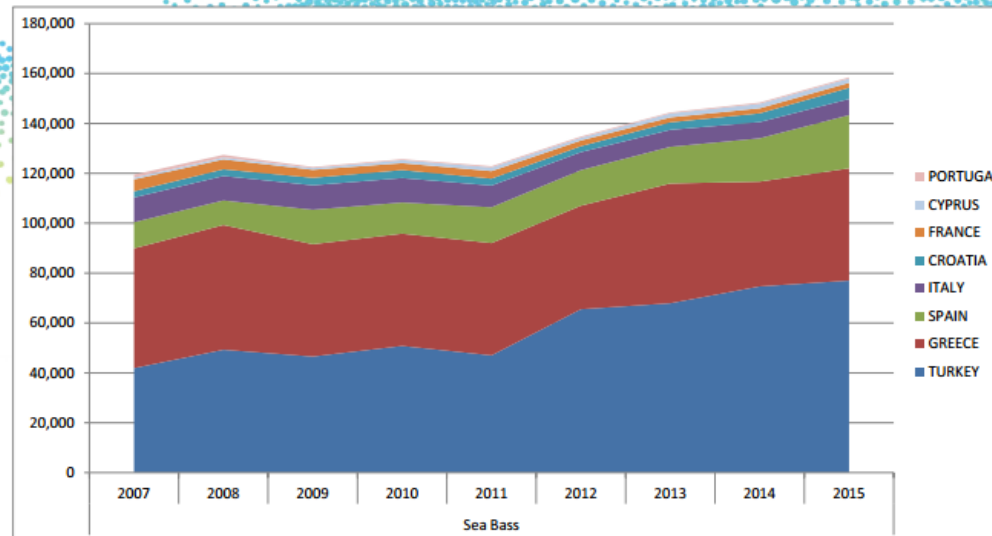
WHICH SPECIES OF FISH WE HAVE TO DEAL WITH?

Sea Bass production –tonns

EUROPEAN SEABASS (*DICENTRARCHUS LABRAX*)



PRODUCTION (tons)		YEAR									
SPECIES	COUNTRY	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Sea Bass	TURKEY	41,900	49,270	46,554	50,796	47,013	65,512	67,912	74,653	77,000	
	GREECE	48,000	50,000	45,000	45,000	45,000	41,500	48,000	42,000	45,000	
	SPAIN	10,480	9,840	13,840	12,495	14,370	14,270	14,700	17,376	21,324	
	ITALY	9,900	9,800	9,800	9,800	8,700	7,200	6,800	6,500	6,450	
	FRANCE	4,764	3,968	3,204	2,779	3,000	2,300	1,970	2,021	1,980	
	CROATIA	2,500	2,700	3,000	3,200	2,785	2,375	3,014	3,500	4,500	
	CYPRUS	740	752	703	1,237	1,500	1,096	1,621	1,817	1,725	
	PORTUGAL	1,205	1,069	444	396	480	500	400	500	500	
Sea Bass Total		119,489	127,399	122,545	125,703	122,848	134,753	144,417	148,367	158,479	



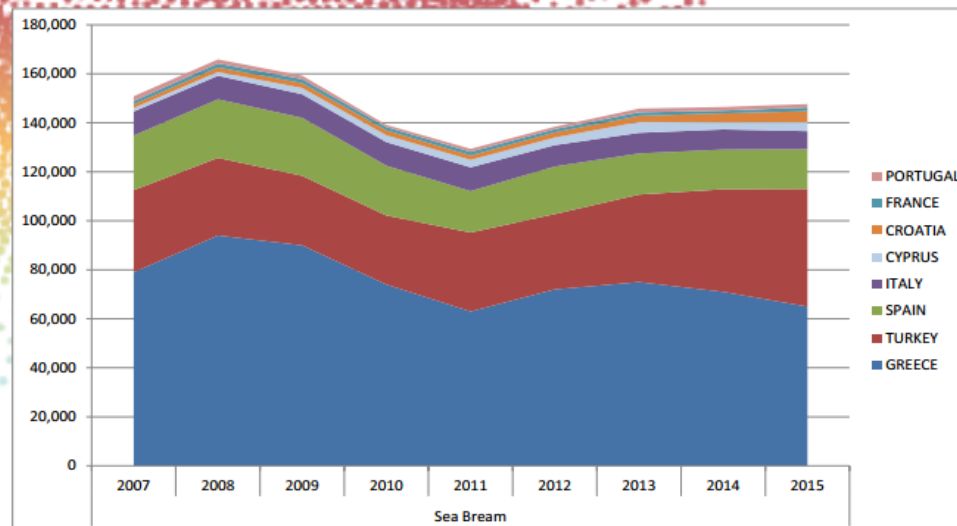
WHICH SPECIES OF FISH WE HAVE TO DEAL WITH?

Sea Bream production –tonns



GILTHEAD SEABREAM (SPARUS AURATA)

PRODUCTION (tons)		YEAR								
SPECIES	COUNTRY	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sea Bream	GREECE	79,000	94,000	90,000	74,000	63,000	72,000	75,000	71,000	65,000
	TURKEY	33,500	31,670	28,362	28,157	32,187	30,743	35,701	41,873	48,000
	SPAIN	22,320	23,930	23,690	20,360	16,930	19,430	16,800	16,230	16,231
	ITALY	9,800	9,600	9,600	9,600	9,700	8,700	8,400	8,200	7,360
	CROATIA	1,500	1,800	2,000	2,000	1,793	2,105	2,466	3,640	4,500
	CYPRUS	1,404	1,600	2,572	2,799	3,065	3,121	4,444	2,919	3,656
	PORTUGAL	1,930	1,635	1,383	851	1,200	1,000	1,500	1,500	1,400
	FRANCE	1,392	1,636	1,648	1,377	1,500	1,300	1,477	1,105	1,502
Sea Bream Total		150,846	165,871	159,255	139,144	129,375	138,399	145,788	146,467	147,649



WHICH SPECIES OF FISH WE HAVE TO DEAL WITH?

Sea bream production –thousands of juveniles

JUVENILE PRODUCTION OF EUROPEAN SEABASS & GILTHEAD SEABREAM



PRODUCTION '000 juveniles		YEAR								
SPECIES	COUNTRY	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sea Bass	TURKEY	147,000	180,000	117,500	105,000	149,000	205,000	172,000	178,000	220,000
	GREECE	130,000	195,700	180,000	180,000	174,000	184,000	192,000	175,000	175,000
	FRANCE	34,420	35,307	39,732	39,800	45,742	46,000	46,542	48,382	55,575
	SPAIN	29,200	34,000	24,650	28,199	33,150	36,423	31,125	43,328	24,903
	ITALY	55,000	55,000	55,000	55,000	48,000	40,000	45,000	42,000	27,500
	CYPRUS	3,117	3,500	3,610	2,522	4,359	5,280	3,955	4,334	6,964
	CROATIA	11,000	13,000	8,100	9,000	8,600	8,100	5,100	1,000	1,000
	PORTUGAL	2,371	2,214	2,182	1,290	1,500	0	0	0	0
Sea Bass Total		412,108	518,721	430,774	420,811	464,351	524,803	495,722	492,044	510,942
Sea Bream	GREECE	220,000	214,000	150,000	160,000	242,000	245,000	266,000	237,000	245,000
	TURKEY	103,000	80,000	72,000	85,000	140,000	185,000	138,000	149,000	120,000
	ITALY	52,000	50,000	48,000	48,000	62,000	70,000	65,000	67,000	60,000
	SPAIN	67,370	47,282	32,180	36,451	52,900	54,985	51,420	65,786	39,250
	FRANCE	26,740	31,317	22,300	29,100	41,742	30,400	43,728	47,103	54,510
	CYPRUS	12,502	13,000	8,589	8,929	18,479	7,976	14,267	23,588	27,927
	CROATIA	6,000	7,000	6,000	8,929	6,900	5,400	3,400	0	0
	PORTUGAL	29,722	21,722	3,810	1,378	1,000	0	0	0	0
Sea Bream Total		517,334	464,321	342,879	377,787	565,021	598,761	581,815	589,477	546,687
Grand Total		929,442	983,042	773,653	798,598	1,029,372	1,123,564	1,077,537	1,081,521	1,057,629

AIM:

**Continue survey established in 2013
targeting main problems, follow trends and
highlight emergence of new disease**



Contributions from 18 Experts

18- Marine

10- Freshwater

Legislative frame

CD 2006/88

- Bass and bream are not in the list of susceptible species **BUT**

Article 10

Animal health surveillance scheme

Member States shall ensure that a risk-based animal health surveillance scheme is **applied in all farms and farming areas**, as appropriate for the type of production.

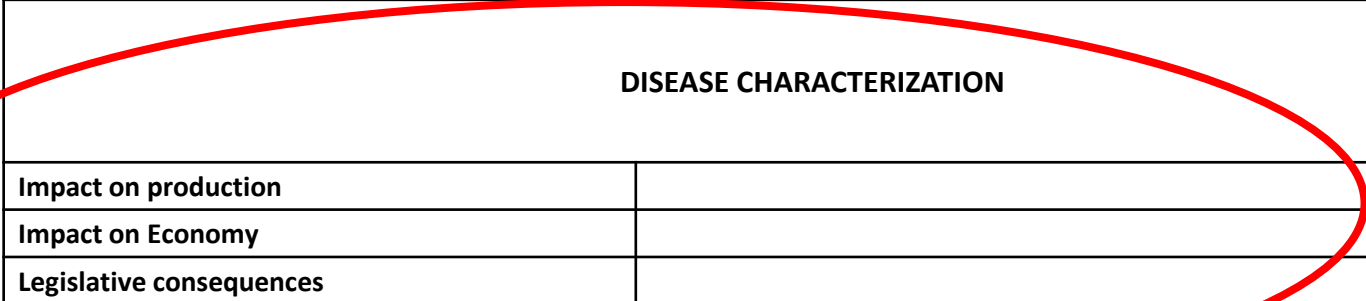
shall aim at the detection of:

- (a) **any increased mortality in all farms** and farming areas as appropriate for the type of production;
- (b) the **diseases listed** in Part II of Annex IV, in farms and farming areas were **species susceptible** to those diseases are present

Questionnaire template

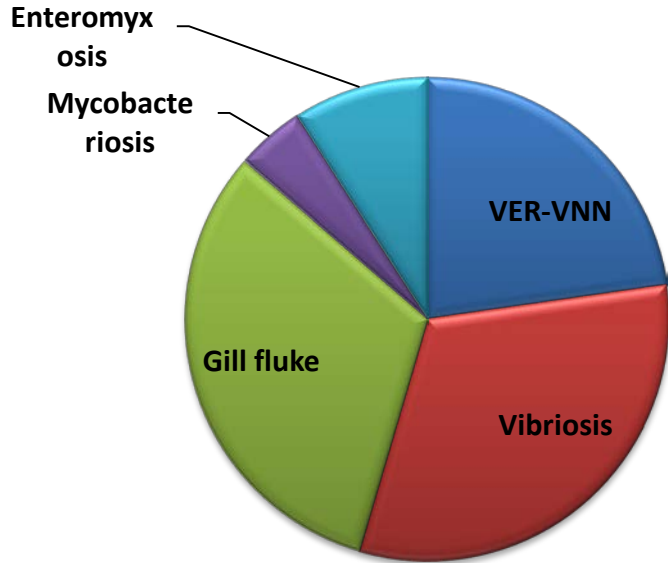
Third disease to be considered for its impact in the aquaculture sector

Name	
Aetiology	
Symptoms / Diagnosis	
Control methods applied	
Area of interest	
Species affected / size	
Rearing sector affected (Hatchery/nursery/ongrowing)	
DISEASE CHARACTERIZATION	
Impact on production	
Impact on Economy	
Legislative consequences	

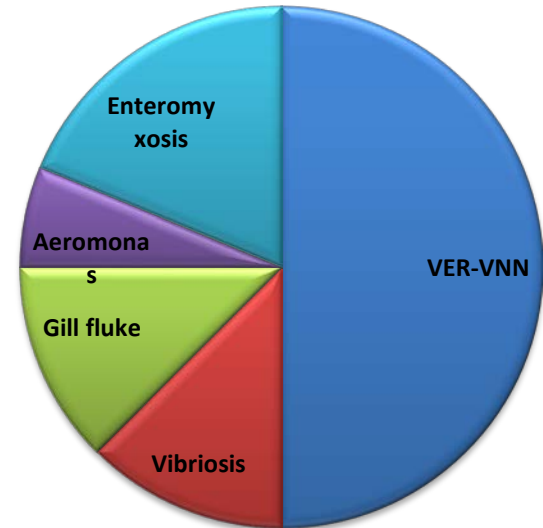


Salt Water Results

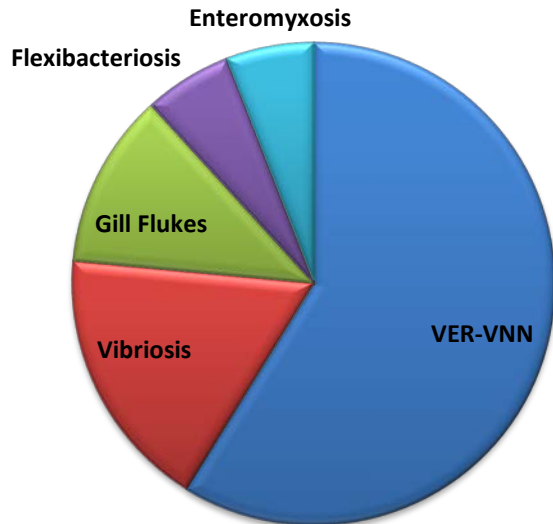
1st SW disease in 2013



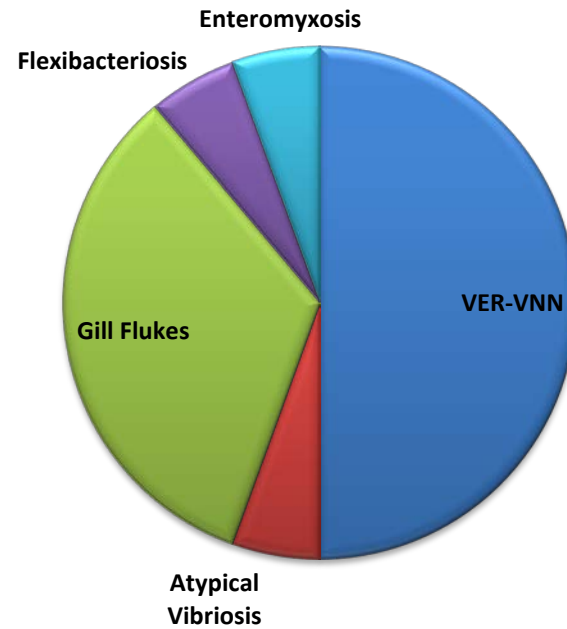
1st SW disease in 2014



1st Disease SW 2015



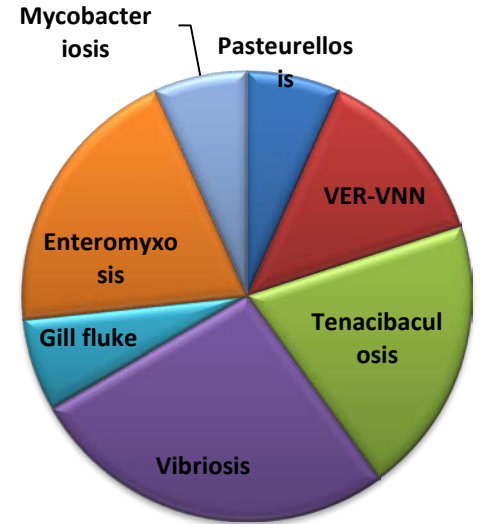
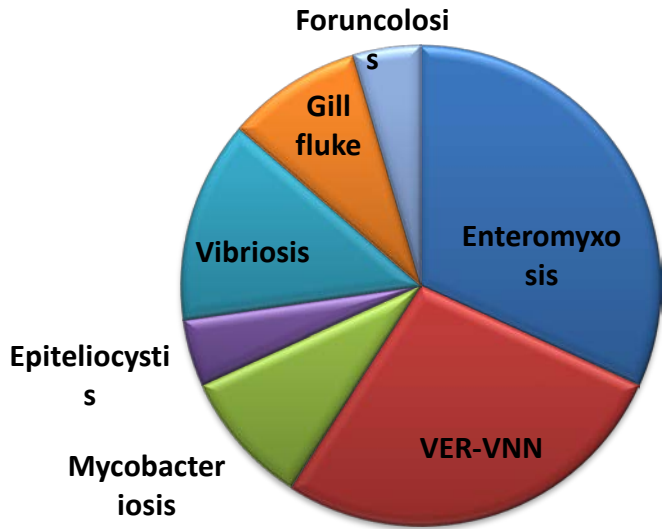
1st Disease SW 2016



2013

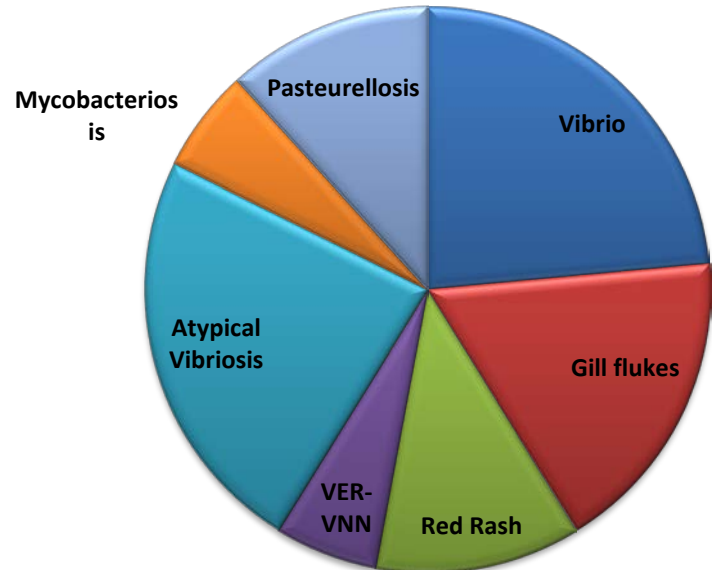
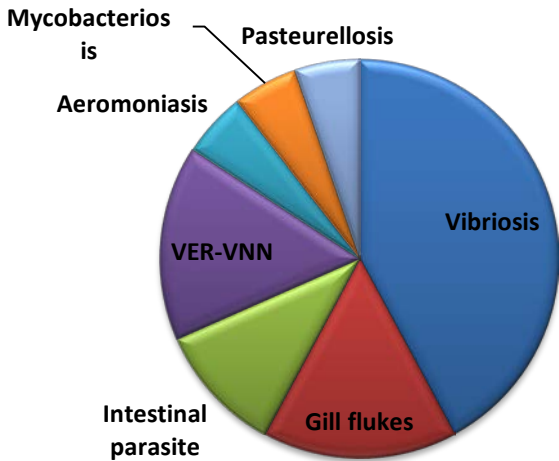
2nd Dis. Salt Water Results

2014



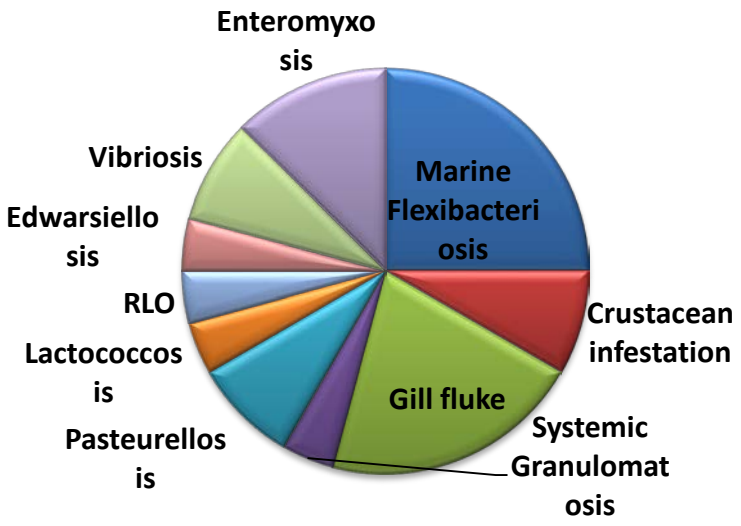
2nd Disease SW 2016

2015

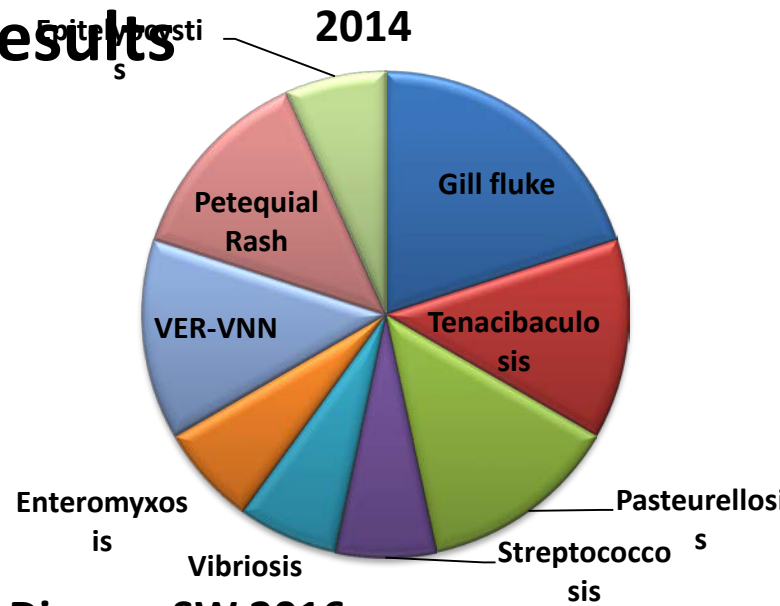


3rd Dis. Salt Water Results

2013

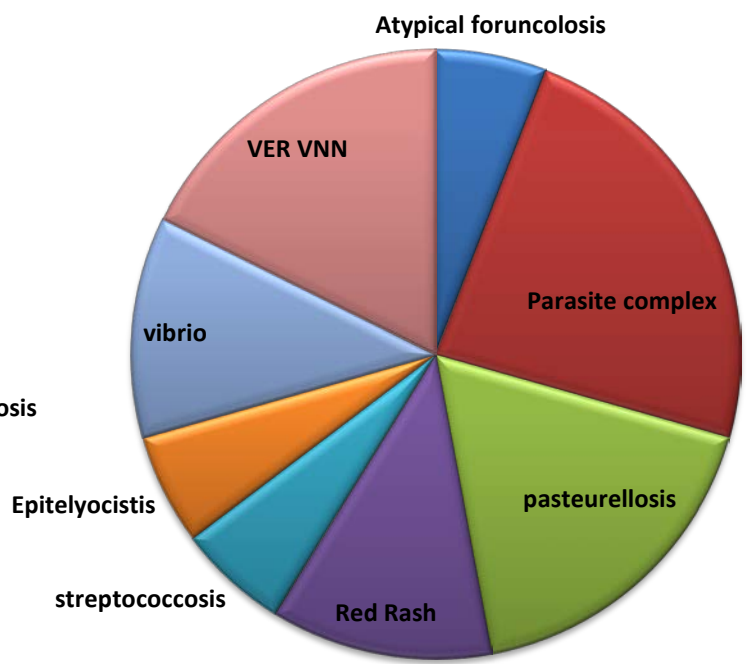
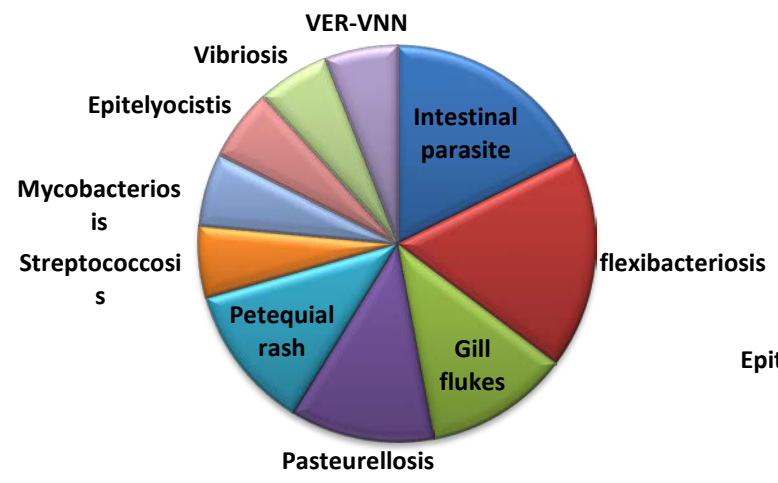


2014



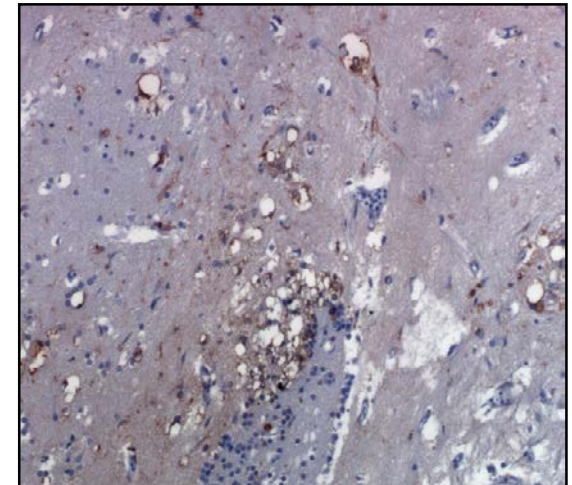
3rd Disease SW 2016

2015



Results – Marine - VIRUS

- VER/VNN is by far the most important disease in 2016, and the importance is increasing since 2013
- Field trial of vaccine prototypes in progress
- Sea bass remain target species mainly at larval/nursery stage, with implication for market size as well
- Sea bream larval stage

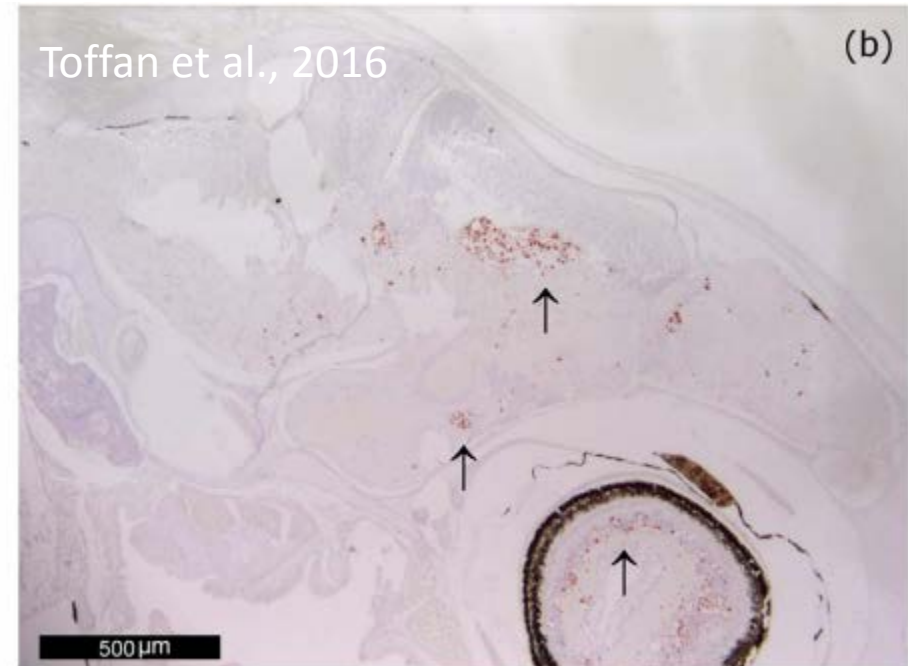


Nodavirus in Sea-Bream

Viral nervous necrosis in gilthead sea bream (*Sparus aurata*) caused by reassortant betanodavirus RGNNV/SJNNV: an emerging threat for Mediterranean aquaculture

Toffan et al., 2016

- Vertical transmission
- Biosecurity measures
- Diagnostic test development



Results – Marine 2 - Bacteria

Major constraint for Marine aquaculture despite the availability of therapeutic treatment and (few) vaccines

- **Vibrio** (*Vibrio Anguillarum* plus atypical vibriosis i.e. *Vibrio harveyi*: uncoordinated swimming behavior, progressive weight loss, exophthalmos, keratitis, skin lesions)



Results Marine 3 – Parasites complex



Third disease to be considered for its impact in the aquaculture sector

Name	PARASITIC DISEASES OF SPARIDS: ENTEROMYXOSIS, SPARICOTYLOSIS, ENTEROSPOROSIS, INFECTION BY APOROCOTYLIDS
Aetiology	Enteromyxum leei (Myxozoa) - Sparicotyle chrysophrii (Monogenea, Polyopisthocotylea) – Enterospora nucleophila (Microsporidia) – Cardicola aurata (Digenea, Aporocotylidae)
Symptoms / Diagnosis	ENTEROMYXOSIS: enteritis (progressive weight loss in gilthead seabream, high mortality in sharpsnout seabream) SPARICOTYLOSIS: gill anemia in gilthead seabream ENTEROSPOROSIS: emaciative syndrome INFECTION BY APOROCOTYLIDS: gill necrosis Diagnosis: Clinical diagnosis, necropsy, parasite detection/identification + detection of Aporocotylids eggs in gills (adults in circulatory system) + PCR for early stages of E. leei + PCR for E. nucleophila infection
Control methods applied	Reduction of biomass density (if feasible) - change of cage nets (for Sparicotyle and Aporocotylid infections) Problem: lack of licensed effective antiparasitic treatments
Species affected / size	ENTEROMYXOSIS: gilthead seabream >100-150g, sharpsnout seabream <80g + other sparids and non sparids SPARICOTYLOSIS: gilthead seabream – all sizes ENTEROSPOROSIS: mainly juveniles INFECTION BY APOROCOTYLIDS: mainly juveniles
Rearing sector affected (Hatchery/nursery/ongrowing)	Ongrowing

Courtesy of Prof. Fioravanti

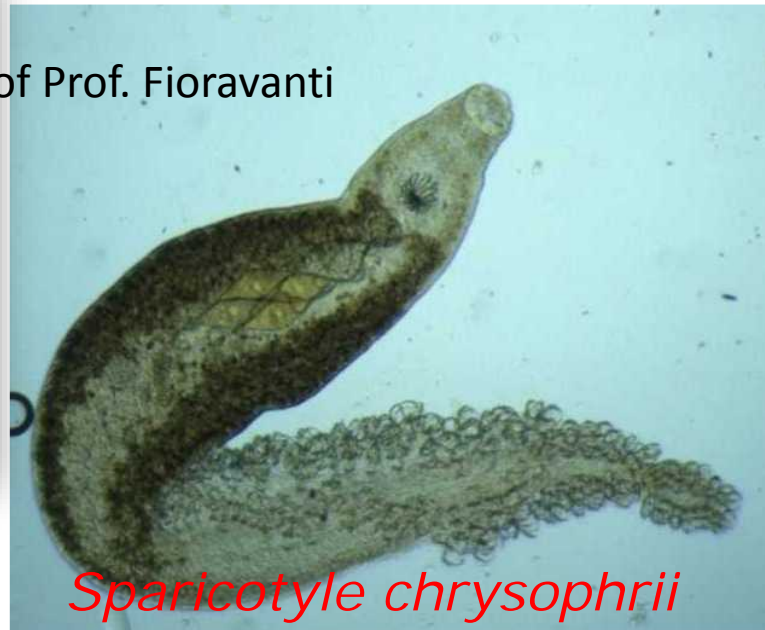
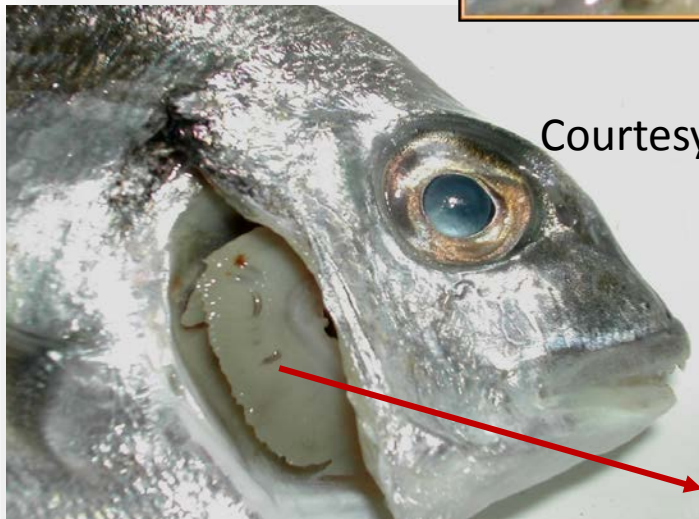
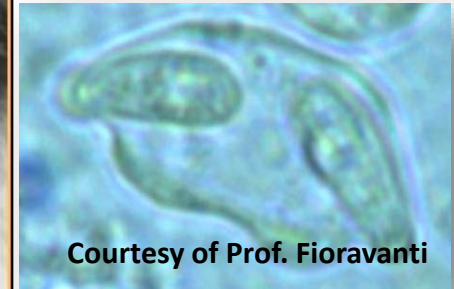
Courtesy of Prof. Fioravanti

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Sparicotyle chrysophrii



Red Rash Syndrome

- Aetiology unknown
- Affect mostly adult gilthead sea bream
- Observed mainly in cages
- Seasonal appearance during cold months, syndrome tend to solve when temperature rise again.
- High morbidity – low mortality – problem in marketability of the fish
- Effective treatment possible with antibiotics (Oxytetracycline)



Red Rash Syndrome

- Is it Emerging?
 - First observance in 2003.
 - Reported at EAFP *2007 Padrós & Zarza, EAFP Grado*
 - AW 2010 – Dr. Bovo

- Why has it gain importance?

- Perceived increased prevalence
- Increased awareness on the use of Antibiotics
- Similarities with Red Mark Syndrome in Rainbow trout

Two new large research programs on Med. Aquaculture



MedAID aims to increase the overall competitiveness and sustainability of the Mediterranean marine fish farming aquaculture sector, throughout the whole value chain.

Impacts

MedAID will combine socioeconomics, biological sciences and food technology to improve competitiveness for the industry by providing strategies for optimizing production processes, marketing, business, administration and sector image and governance.

The project will provide integrated solutions targeted at solving specific industrial bottlenecks throughout the whole value chain.

Guides and recommendations produced by MedAID will widen the range of available tools and allow harmonization, networking and data sharing for analysis at regional level.



and



Thank all of you for your attention

And thanks all experts for providing interesting replies:

- Panos varvarigos
- Thanos Prapas
- Daniel Gijon
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- Nadav Davidovich
- Maria Letizia Fioravanti
- Snjezana Zrncic
- Fabio Borghesan
- Micaela Bras
- Francesc Padros
- Pierpaolo Patarnello
- Thomas Siampras
- Jes Brinch-Iversen
- Carlos Zarza
- Mercè Isern
- Carlos Rodriguez
- Elena Planas Callao
- Marino Prearo

