Egg quality criteria in common dentex (*Dentex dentex* Linnaeus)

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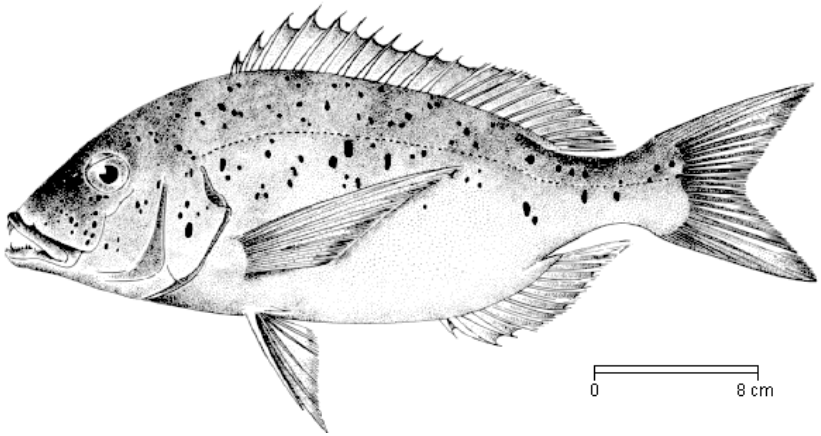


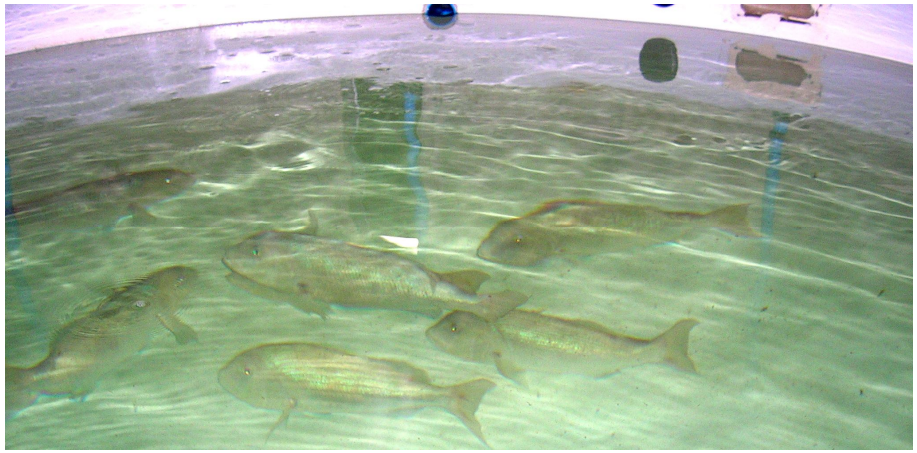
Common dentex (*Dentex dentex* Linnaeus, 1758)

OBJECTIVES

- Compare egg quality
  - Captive broodstocks
  - Among the same spawning season
  - Between years
- Determine egg quality criteria
- Biochemical criteria

14L:10D, 18 – 20 ºC

- Tank 1
  - 7 males (1147 g ave.)
  - 5 females (1449 g ave.)
- Tank 2
  - 6 males (1482 g ave.)
  - 4 females (1561 g ave.)



Broodstocks rearing

- Egg volumes (ml)
  - Total
  - Floating/Non floating

2005	2006
ELISA plates	ELISA plates
Lipids	Weight (wet & dry)
Enzymes	Lipids
Metabolites	Enzymes
Genetics	Metabolites
	Genetics
	Morphology

Genetics

19ºC, darkness, starved

- Developmental stage
- Hatching rate
- Larval survival
- Deformities

Metabolites

- Total carbohydrates
- Hexose
- 6-deoxyhexose
- Heptose
- Ribose
- Ketoses
- Glucose-6-phosphate
- Fructose-6-phosphate
- Sialic acid
- ATP

Tested biochemical parameters

Enzymes

- Succinate dehydrogenase
- Glucose-6-phosphate dehydrogenase
- Acid phosphatase
- Pyruvate kinase
- Adenylate kinase
- Transaldolase
- Aspartate aminotransferase
- Malate dehydrogenase

Tested biochemical parameters

Lipids

– Total
– Fatty acids composition
– Lipid classes

Volumes

	Broodstock 1		Broodstock 2	
	2005	**2006**	**2005**	**2006**
Floating (ml)	3520	14150	4140	8925
Sinking (ml)	1890	4385	3120	6310
Total (ml)	5410	18535	7260	15235
Spawning days	76	128	87	129

Brooddstock 1

Spaw. date	Hatch. Rate (%)	Hatch. Surv. (%)	Mort. 3 dph (%)	Mort. 5 dph (%)	Day 100% mortality	Deformities (%)	Female(s) code
27/4/06	**97.92**	**100.00**	**57.61**	**72.83**	**10**	**0**	**7FC2, 340F**
28/4/06	**85.26**	**100.00**	**56.79**	**69.14**	**9**	**0**	
29/4/06	57.29	94.55	16.36	16.36	9	0	
30/4/06	92.71	84.88	34.88	38.37	10	4.17	
2/5/06	92.93	96.74	21.74	27.17	10	1.01	
3/5/06	**83.51**	**91.36**	**40.74**	**40.74**	**11**	**7.22**	
4/5/06	96.88	92.86	22.62	26.19	11	2.08	
5/5/06	100.00	98.95	9.47	11.58	11	2.11	
6/5/06	**100.00**	**98.92**	**6.45**	**11.83**	**11**	**0**	**340F, 8337**
7/5/06	95.83	81.61	24.14	24.14	11	10.42	
8/5/06	90.53	75.00	35.00	35.00	10	9.47	7FC2, 340F
9/5/06	96.84	94.57	8.70	29.35	10	2.11	
11/5/06	**98.96**	**96.84**	**3.16**	**6.32**	**10**	**0.00**	
12/5/06	**91.67**	**100.00**	**9.09**	**9.09**	**11**	**7.14**	
13/5/06	**100.00**	**97.92**	**4.17**	**4.17**	**11**	**0.00**	
17/5/06	93.75	83.95	32.10	33.33	10	0.00	
23/5/06	**96.88**	**96.74**	**36.96**	**42.39**	**10**	**0.00**	**340F**
26/5/06	81.63	93.51	27.27	27.27	11	2.04	

Brooddstock 2

Spaw. date	Hatch. Rate (%)	Hatch. Surv. (%)	Mort. 3 dph (%)	Mort. 5 dph (%)	Day 100% mortality	Deformities (%)	Female(s) code
28/4/06	24.21	82.61	34.78	34.78	8	0.00	
29/4/06	**88.54**	**97.62**	**7.14**	**10.71**	**9**	**0.00**	**3F5E, 118F**
30/4/06	94.79	95.56	21.11	23.33	10	0.00	
2/5/06	95.51	91.67	19.05	26.19	10	6.74	
3/5/06	100.00	100.00	8.79	13.19	10	1.03	
4/5/06	**93.68**	**96.63**	**3.37**	**4.49**	**11**	**2.11**	**3F5E, 118F**
5/5/06	**98.96**	**100.00**	**3.16**	**3.16**	**10**	**0.00**	
6/5/06	**97.89**	**98.92**	**1.08**	**2.15**	**10**	**0.00**	**3F5E**
7/5/06	**95.83**	**93.48**	**7.61**	**7.61**	**11**	**1.04**	
8/5/06	**97.83**	**95.56**	**7.78**	**7.78**	**10**	**1.09**	**3F5E, 118F**
9/5/06	91.67	96.59	13.64	21.59	9	1.04	
12/5/06	95.83	90.70	16.28	17.44	10	2.08	
13/5/06	95.83	92.13	17.98	17.98	10	2.08	
23/5/06	57.73	98.21	41.07	50.00	10	0.00	
26/5/06	**71.43**	**78.46**	**41.54**	**49.23**	**11**	**5.10**	**3F5E, 118F, 8D1D**
27/5/06	**48.45**	**76.60**	**40.43**	**46.81**	**10**	**1.03**	

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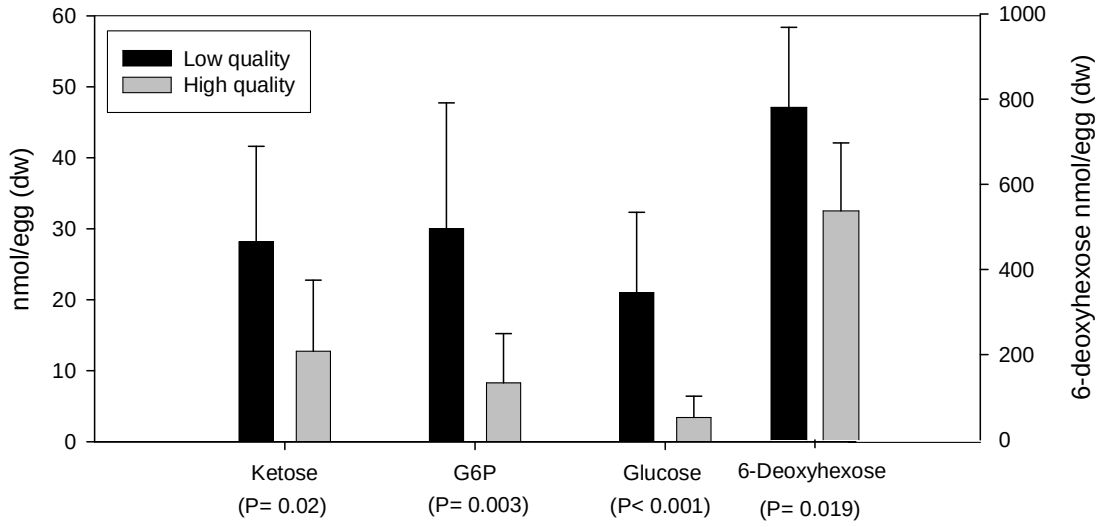
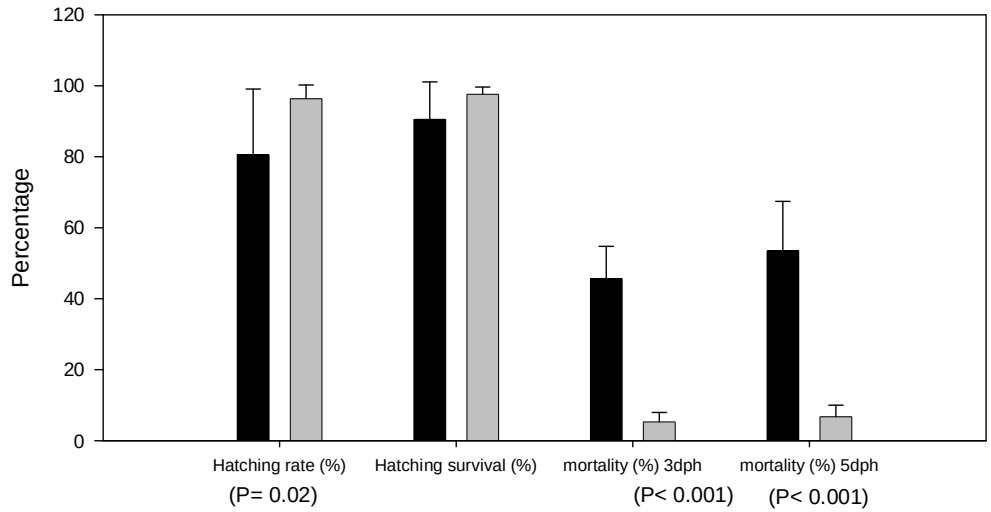
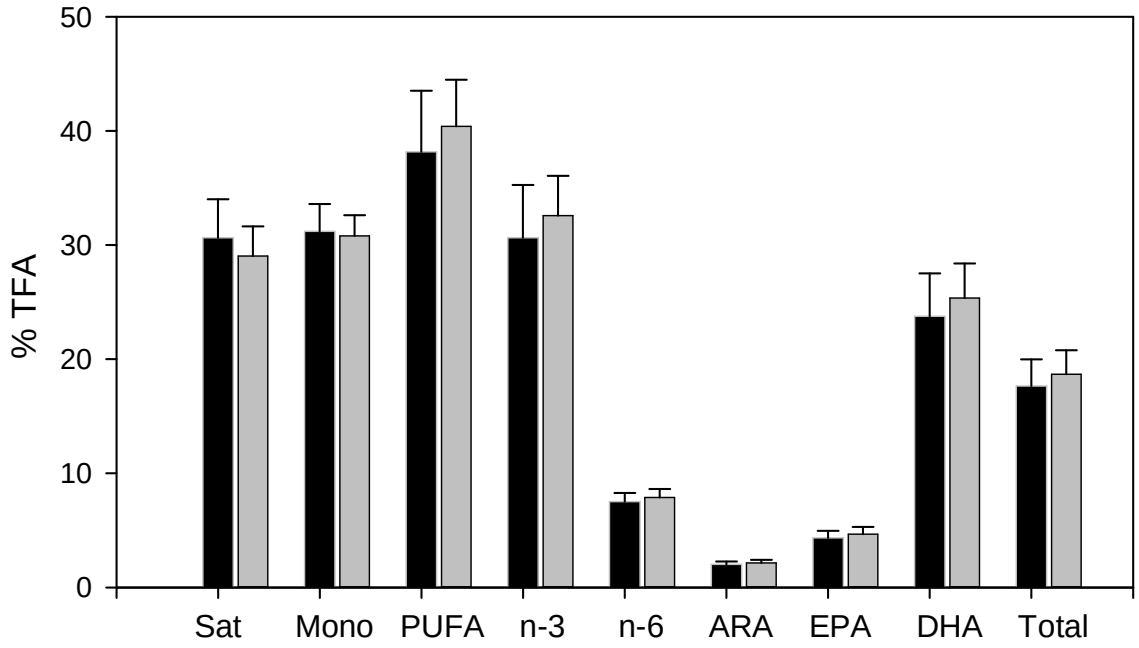
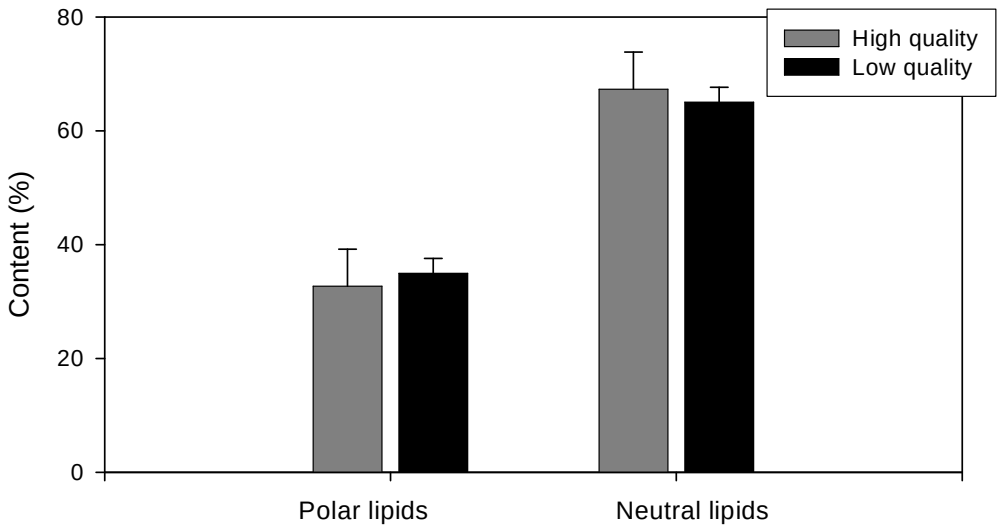
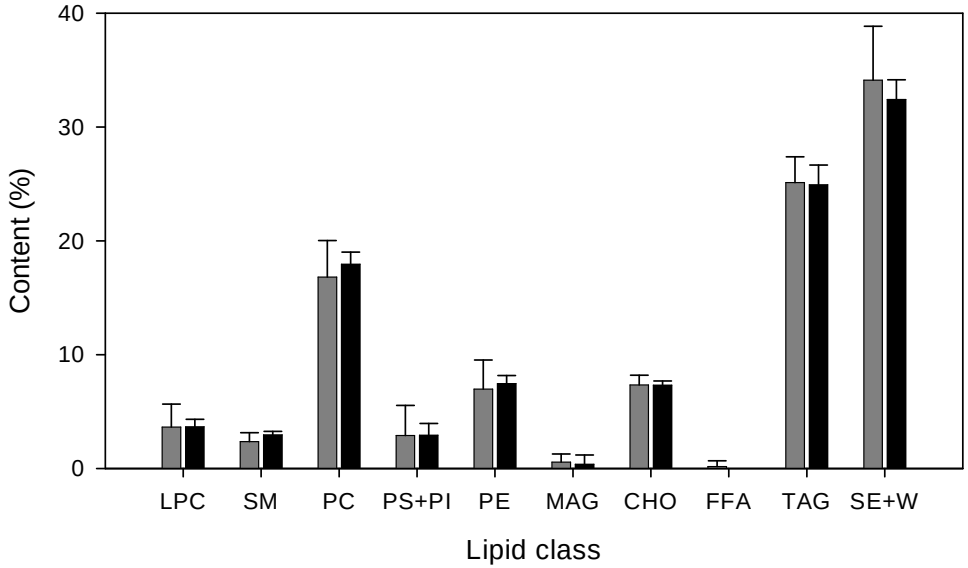






Fatty acids


80
60
40
20
0
Content (%)
High quality
Low quality
Polar lipids
Neutral lipids


40
30
20
10
0
Content (%)
LPC
SM
PC
PS+PI
PE
MAG
CHO
FFA
TAG
SE+W
Lipid class

Lipid class

Conclusions

- Microsatellite loci → parental identification and contribution
- Hatching rate unrelated to larval mortality
- Not single regression, multiple regression needed
- No significant differences in enzyme activity
- Significant differences in carbohydrate content:
  - Low-quality: Higher amounts of ketose, glucose-6-phosphate, glucose and 6-deoxyhexose
- No significant differences in lipid analysis

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