

Morphological and ecophysiological adaptations of wild gilthead seabream *Sparus aurata* associated with tuna farms

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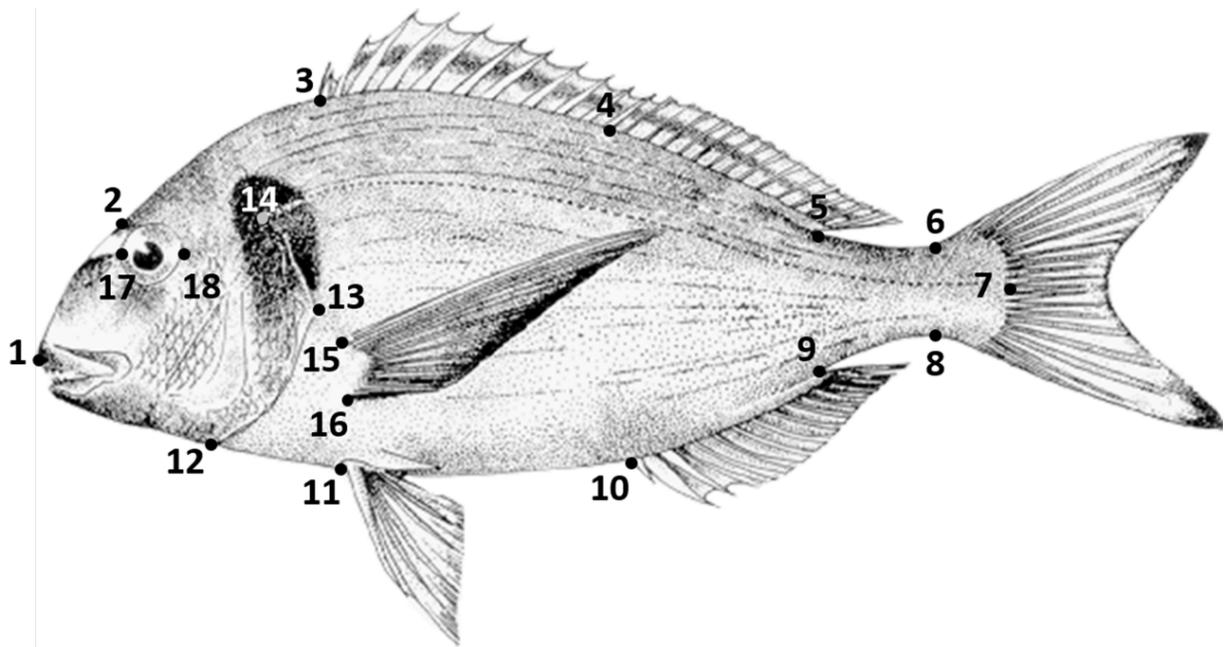


Fig. S1. Graphical representation of 18 landmark positions used to visualise the body shape of the sampled *Sparus aurata*: 1) anterior tip of snout at the upper jaw; 2) vertical point above the most anterior point in the eye; 3) anterior insertion of the dorsal fin; 4) last spiny ray of the dorsal fin; 5) posterior insertion of the dorsal fin; 6) dorsal point at the least depth of the caudal peduncle; 7) posterior body extremity; 8) ventral point at the least depth of the caudal peduncle; 9) posterior insertion of the anal fin; 10) anterior insertion of the anal fin; 11) insertion of the pelvic fin; 12) ventral tip of the insertion of the operculum on the lateral profile; 13) point of maximum extension of the operculum on the lateral profile; 14) anterior extremity of the lateral line on the head profile; 15) dorsal insertion of the pectoral fin; 16) ventral insertion of the pectoral fin; 17) the most anterior point in the eye; 18) the most posterior point in the eye

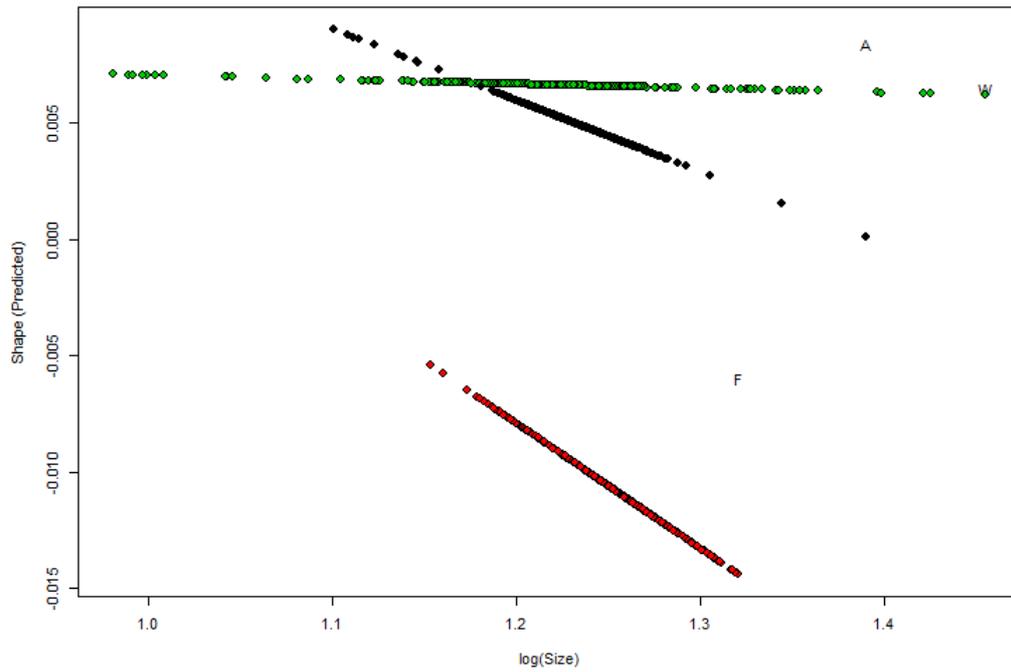


Fig. S2. Significant angular differences in the allometric slopes between sampled origins (W-wild, A-farm associated, F-farmed), where fish change shape as they grow in different ways, and vector length differences, where individuals from different origins change shape more as they grow, display heterogeneous patterns

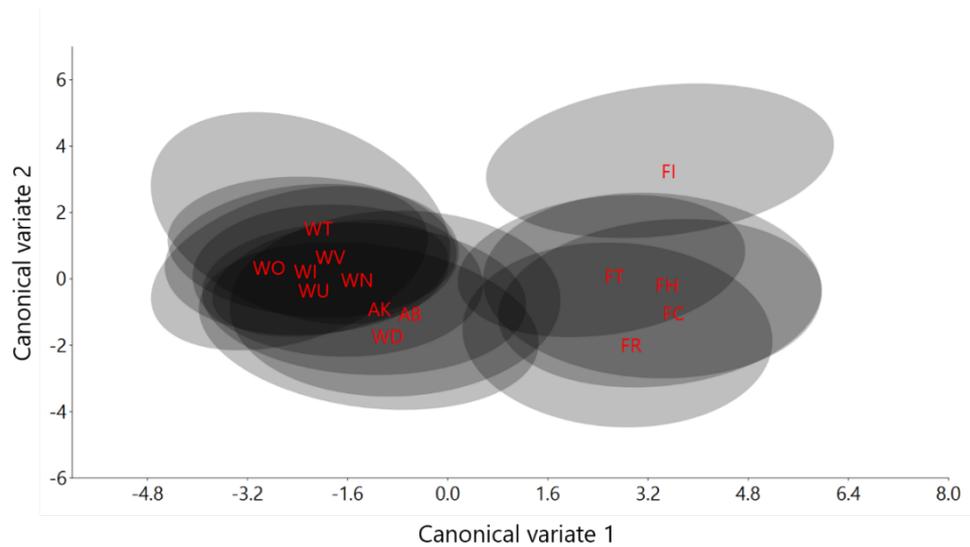


Fig. S3. Canonical variate (CV) ordination plot of sampled populations with displayed 95 % confidence ellipses. The nomenclature of the samples have been derived according to the: (a) origin of the fish (A – farm associated, F – farmed, W – Wild); (b) sampling location and farmed population origin with applied rearing technology (AB = Brač tuna farm; AB = Kali tuna farm; FR = French conventional; FI = Italian conventional; FT = Italian organic; FC = Croatian conventional; FH = Croatian organic; WD = Dubrovnik; WI = Istria; WN = Novigrad Sea; WO = Trogir; WU = Unije; WV = Velebit Channel; WT = Tar)

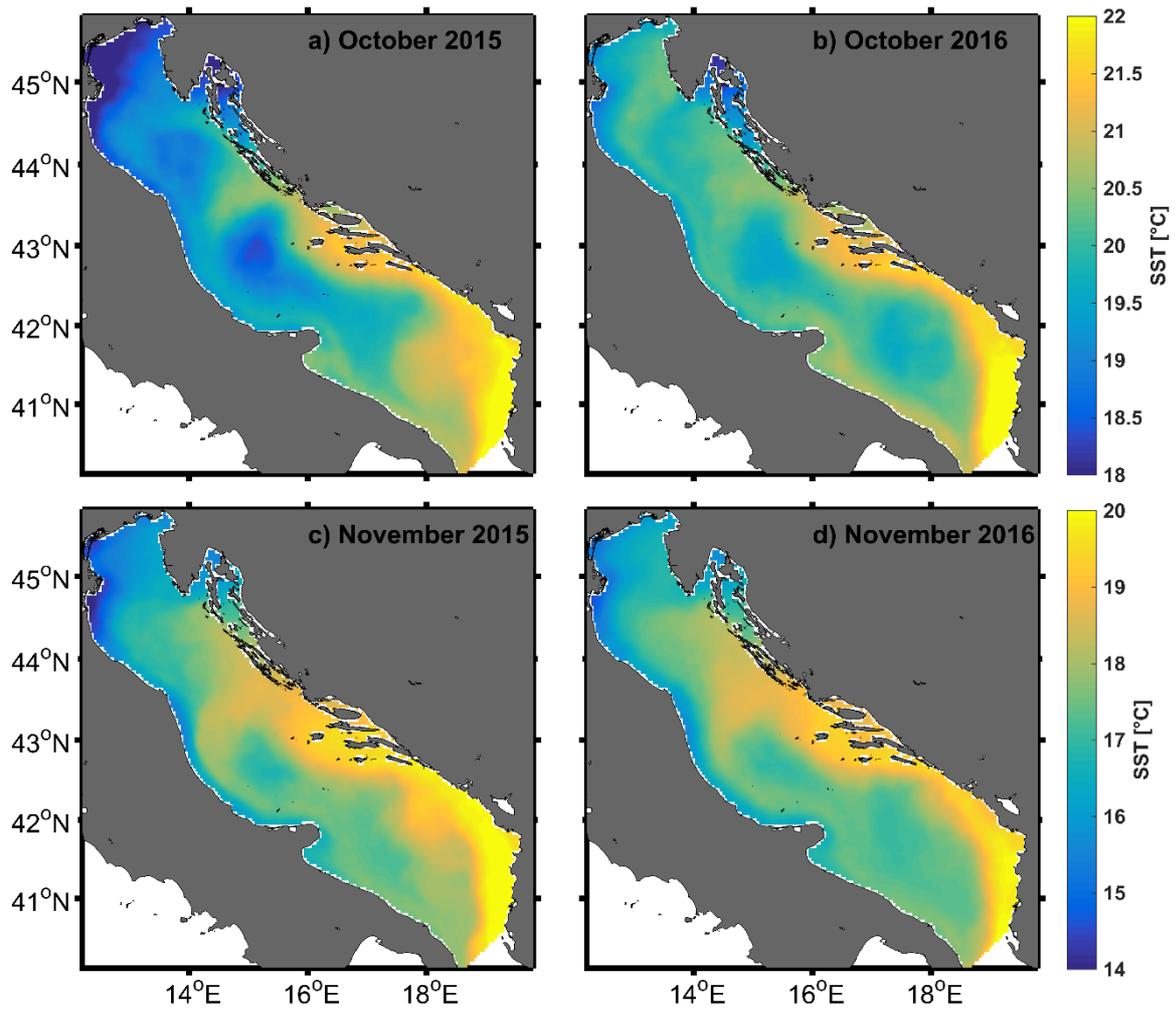


Fig. S4. Monthly mean SST obtained from reprocessed AVHRR satellite data during the sampled period in two consecutive years

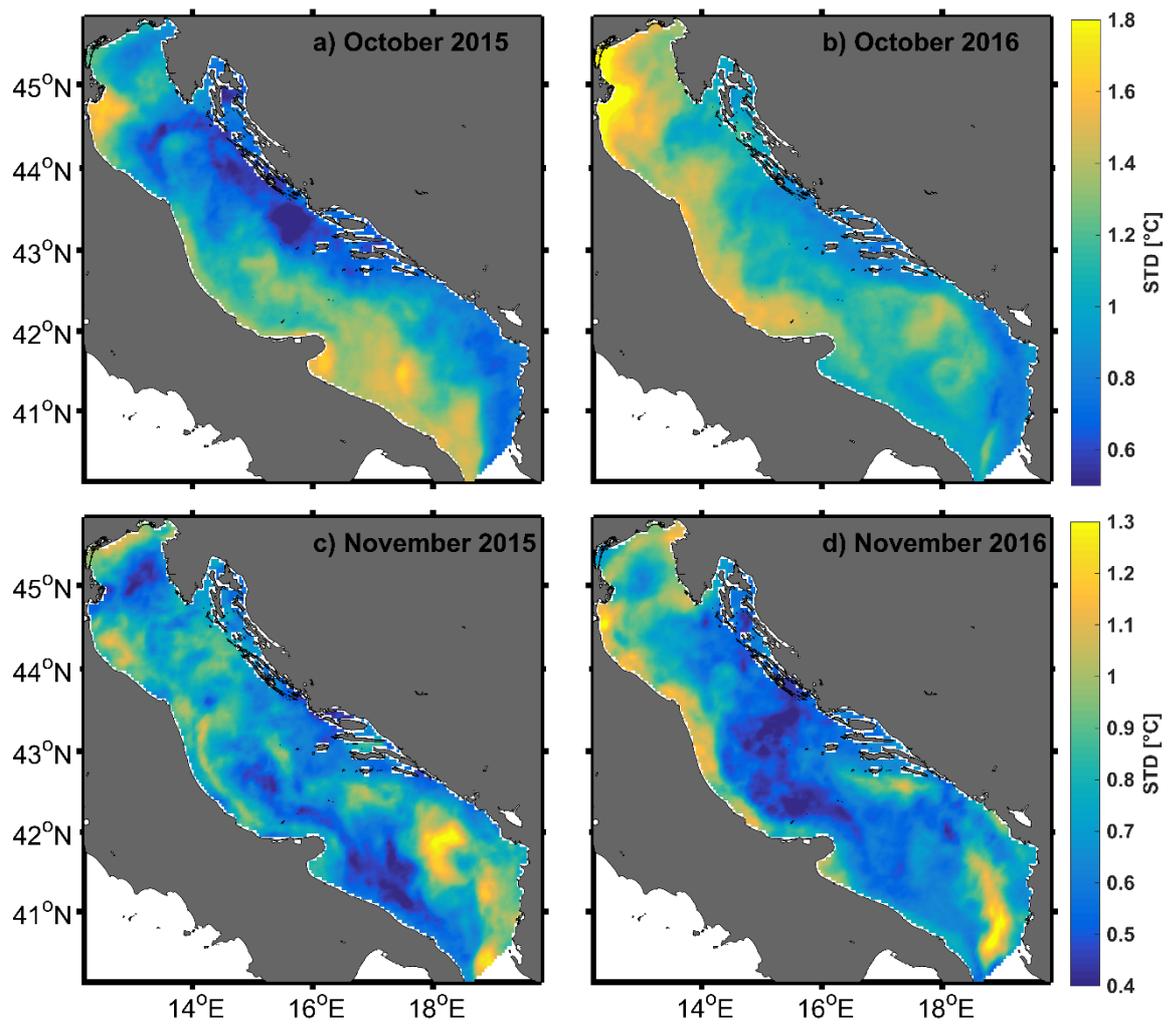


Fig. S5. SST standard deviation (STD) obtained from reprocessed AVHRR satellite data during the sampled period in two consecutive years

Table S1. Procrustes distances between mean body shapes of gilthead seabream from the sampled farm-associated, farmed and wild populations. Values in bold displayed pairwise comparisons of mean shapes between populations that are for one-fold smaller than the remaining pairwise comparisons

Population	AB	AK	FC	FH	FI	FR	FT	WD	WI	WN	WO	WT	WU
AK	0.0046*	—	—	—	—	—	—	—	—	—	—	—	—
FC	0.0169	0.0201	—	—	—	—	—	—	—	—	—	—	—
FH	0.0186	0.0222	0.0122	—	—	—	—	—	—	—	—	—	—
FI	0.0218	0.0245	0.0211	0.0221	—	—	—	—	—	—	—	—	—
FR	0.0147	0.0185	0.0085	0.0115	0.0183	—	—	—	—	—	—	—	—
FT	0.0169	0.0198	0.0163	0.0130	0.0213	0.0144	—	—	—	—	—	—	—
WD	0.0087	0.0086	0.0217	0.0237	0.0229	0.0189	0.0214	—	—	—	—	—	—
WI	0.0138	0.0143	0.0233	0.0203	0.0264	0.0220	0.0181	0.0164	—	—	—	—	—
WN	0.0083	0.0073	0.0214	0.0226	0.0247	0.0197	0.0215	0.0121	0.0158	—	—	—	—
WO	0.0195	0.0156	0.0318	0.0352	0.0335	0.0316	0.0311	0.0185	0.0232	0.0186	—	—	—
WT	0.0185	0.0194	0.0220	0.0270	0.0253	0.0226	0.0283	0.0220	0.0235	0.0182	0.0277	—	—
WU	0.0121	0.0131	0.0219	0.0188	0.0269	0.0200	0.0160	0.0170	0.0096	0.0138	0.0230	0.0246	—
WV	0.0120	0.0109	0.0241	0.0230	0.0260	0.0230	0.0204	0.0143	0.0079	0.0122	0.0170	0.0215	0.0109

Bonferroni correction of p – value ($\alpha = 0.01/91 = 0.00011$). * A non-significant p value (0.0004) was recorded only for pairwise comparisons among farm-associated populations.

Table S2. Length-weight relationship and relative condition index (Kn) equations for wild, farm-associated and farmed gilthead seabream for the total length interval of 22 – 31 cm

Origin	N	Logarithmic	Exponential	r ²	Relative condition index
Farm associated	277	$\log_{10}Wt = 3.2861*TL - 2.2778$	$Wt = 0.0053 * TL^{3.2861}$	0.86	$Kn = Wt/[0.0053 * TL^{3.2861}]$
Farmed	407	$\log_{10}Wt = 3.2785*TL - 2.1947$	$Wt = 0.0064 * TL^{3.2785}$	0.90	$Kn = Wt/[0.0064 * TL^{3.2785}]$
Wild	340	$\log_{10}Wt = 3.0215*TL - 1.8639$	$Wt = 0.0137 * TL^{3.0215}$	0.87	$Kn = Wt/[0.0137 * TL^{3.0215}]$
Overall sample	1024	$\log_{10}Wt = 3.3004*TL - 2.2557$	$Wt = 0.0056 * TL^{3.3004}$	0.84	$Kn = Wt/[0.0056 * TL^{3.3004}]$

Table S3. Sex distribution of overall sampled gilthead seabream by origin

Sex categorization	Origin			Total	
	Farm associated	Farmed	Wild		
Count	Male	168	207	217	592
	Intersex phase	76	2	85	163
	Female	33	4	38	75
	Total	277	213	340	830
%	Male	60.7	97.2	63.82	71.32
	Intersex phase	27.4	0.93	25.00	19.64
	Female	11.9	1.87	11.18	9.04
	Total	33.4	25.7	40.9	100