Supplementary Material

Supplementary Results

Supplementary Results 1: Comparison of bivalves to gastropods

Of the 196 taxa recovered, most were gastropods (107, 54.6%) or bivalves (84, 42.9%). More bivalves (78/84 taxa, 92.9%) than gastropods (63/107 taxa, 58.9%) could be identified to the species level (two-sample test for equality of proportions: χ^2_1=26.4, P<0.0001).

Despite similar numbers of gastropod and bivalve taxa, bivalves constituted the vast majority of individuals (80.9%), distantly followed by gastropods (18.9%). Similarly, more bivalve than gastropod individuals were found alive (8.2% vs. 2.3%, two-sample test for equality of proportions: χ^2_1=344.3, P<0.0001). Accordingly, the proportion of bivalve taxa that were found alive (26/84, 31.0%) was higher than that detected for gastropods (14/107, 13.1%, two-sample test for equality of proportions: χ^2_1=8.0, P=0.0046).

The relative proportion of allochthonous taxa was higher for gastropods (54.7%) than for bivalves (36.9%, two-sample test for equality of proportions with continuity correction: χ^2_1=5.3, P=0.022). An analysis of the living community indicates that four taxa classified as allochthonous based on habitat data were recovered alive, three bivalves (*Ctena decussata*, *Musculus costulatus*, *Mytilaster solidus*) and one gastropod (*Jujubinus exasperatus*). These taxa were classified as indigenous in subsequent analyses, resulting in 53.8% allochthonous taxa among gastropods and 33.3% among bivalves (two-sample test for equality of proportions with continuity correction: χ^2_1=7.1, P=0.008).

Supplementary Results 2: Interannual variability

Both taxa richness and abundance were higher in 2009 than in 2008 at all four sites sampled in consecutive years (PC, Fe, CS and So). In 2008, 52 ± 12 taxa (mean ± SE) were found per census, while in 2009 taxa richness had almost doubled to 95 ± 12 taxa per census (b=42.8, P=0.005). This increase was significant both within living (b=10.3, P=0.021) and dead taxa (b=43.0, P=0.006). At the same time, total abundances had tripled between the two years, from 825 ± 283 individuals per census in 2008 to 2708 ± 448 individuals per census in 2009 (b=1883.0, P=0.026). This is mostly due to an increase in the number of dead individuals (b=1716.0, P=0.030), as the number of living individuals did not change significantly over time (b=167.0, P=0.106). As the identity of all 2008 specimens from the dead record was reconfirmed after the completion of the 2009 survey (see methods), identification bias cannot explain this difference. Despite substantial differences in taxa richness and abundance, almost all measures analyzing live-dead agreement in terms of preservation potential, rank abundance, and taxa richness were consistent across the two sampling years (see Supplementary Table 7), the only exception being a slight tendency for higher values of Spearman's rho after excluding allochthonous taxa in 2009 compared to 2008 (b=0.12, P=0.047, Supplementary Table 7).

Supplementary Results 3: Short-term within-season variability

Study sites showed considerable variability across years (see Supplementary Results 2), and short-term fluctuations might be expected to influence inferences on live-dead fauna agreement. We therefore compared replicate censuses to random census pairs, and found that replicate censuses were not significantly more similar to each other than expected by chance (Supplementary Table 8). Taxa richness, abundance, and measures of live-dead agreement all showed significant short-term variability. Even though we cannot exclude that divergence between replicate censuses was in part caused by fine-scale spatial differences (replicate censuses were collected at a distance of about 200 m), these results demonstrate that variability in living and dead communities can be substantial even across very short timespans.

Supplementary Tables

Supplementary Table 1

Ratio of the number of dead to living taxa using rarefied data standardized for the number of living individuals present in a census, and difference in the logarithm of rarefied taxa number (ΔS), computed using the minimum, corrected, and maximum number of bivalve individuals (Gilinsky & Bennington, 1994). The ratio of the number of dead to living taxa using raw data is insensitive to assumptions concerning bivalve sampling. ΔS = log(rarefied number of dead taxa) – log(number of living taxa) (Olszewski & Kidwell, 2007). Mean values of 2009 censuses only include GPS coordinates already sampled in 2008 (marked with an asterisk), while mean values across all censuses (n=12) are shown for comparison.

Census	Ratio of dead to living taxa number (rarefied data)			Difference in log of rarefied taxa number (ΔS)		
	minimum	corrected	maximum	minimum	corrected	maximum
CS08	3.2	3.1	3.0	1.16	1.13	1.11
CS09*	2.7	2.6	2.6	0.99	0.96	0.94
Fe08	2.9	2.8	2.8	1.07	1.04	1.02
Fe09a*	2.0	1.9	1.9	0.68	0.64	0.62
Fe09b	1.7	1.7	1.7	0.55	0.53	0.52
Ge09	3.6	3.5	3.4	1.29	1.26	1.24
PC08	2.9	2.8	2.7	1.06	1.02	1.00
PC09a*	1.8	1.7	1.7	0.57	0.55	0.53
PC09b	2.5	2.4	2.4	0.91	0.89	0.88
So08	2.3	2.2	2.1	0.82	0.79	0.76
So09*	2.8	2.6	2.5	1.01	0.96	0.93
To09	1.6	1.5	1.5	0.47	0.43	0.41
Mean 08	2.8	2.7	2.7	1.03	1.00	0.97
Mean 09	2.3	2.2	2.2	0.81	0.78	0.76
Mean all	2.5	2.4	2.4	0.88	0.85	0.83

Supplementary Table 2

Proportion of dead individuals belonging to taxa sampled alive, computed separately for datasets including all taxa and only indigenous taxa, and using the minimum, corrected, and maximum number of bivalve individuals (Gilinsky & Bennington, 1994). The proportion of dead taxa found alive and the proportion of living taxa found dead are insensitive to assumptions concerning bivalve sampling. Mean values of 2009 censuses only include GPS coordinates already sampled in 2008 (marked with an asterisk), while mean values across all censuses (n=12) are shown for comparison.

Census	Proportion of dead individuals belonging to taxa found alive (all taxa)			Proportion of dead individuals belonging to taxa found alive (only indigenous taxa)		
	minimum	corrected	maximum	minimum	corrected	maximum
CS08	49.0%	51.3%	52.3%	55.2%	57.2%	58.0%
CS09*	44.0%	46.5%	47.5%	48.9%	51.2%	52.2%
Fe08	55.2%	56.9%	57.6%	57.7%	59.3%	59.9%
Fe09a*	56.6%	59.3%	60.5%	62.5%	64.7%	65.7%
Fe09b	59.0%	62.0%	63.2%	64.6%	67.3%	68.4%
Ge09	74.5%	76.5%	77.5%	83.1%	84.4%	85.0%
PC08	48.4%	48.9%	49.7%	51.5%	51.7%	52.6%
PC09a*	49.6%	52.5%	53.8%	68.4%	69.4%	69.8%
PC09b	44.2%	46.8%	47.9%	60.7%	61.6%	61.9%
So08	62.8%	63.7%	64.6%	67.9%	68.3%	68.9%
So09*	84.1%	85.0%	85.4%	89.1%	89.5%	89.7%
To09	67.0%	67.9%	68.3%	69.4%	70.1%	70.4%
Mean 08	53.9%	55.2%	56.0%	58.1%	59.1%	59.9%
Mean 09	58.6%	60.8%	61.8%	67.2%	68.7%	69.3%
Mean all	57.9%	59.8%	60.7%	64.9%	66.2%	66.9%

Supplementary Table 3

Rank-order agreement between a taxon's living and dead abundance (Spearman's rho), computed separately for datasets including all taxa, indigenous taxa only, and for those taxa recovered alive, using the minimum, corrected, and maximum number of bivalve individuals (Gilinsky & Bennington, 1994). Significant rho values (*P*<0.05) are shown in bold. Mean values of 2009 censuses only include GPS coordinates already sampled in 2008 (marked with an asterisk). Mean values across all censuses (n=12) are shown for comparison.

Census	Spearman's rho (all taxa)			Spearman's rho (only indigenous taxa)			Spearman's rho (only taxa found alive)		
	minimum	corrected	maximum	minimum	corrected	maximum	minimum	corrected	maximum
CS08	**0.28**	**0.28**	**0.28**	**0.36**	**0.36**	**0.36**	**0.82**	**0.74**	**0.72**
CS09*	**0.36**	**0.35**	**0.35**	**0.44**	**0.44**	**0.44**	**0.73**	**0.74**	**0.74**
Fe08	**0.36**	**0.36**	**0.36**	**0.41**	**0.40**	**0.40**	**0.89**	**0.89**	**0.89**
Fe09a*	**0.47**	**0.47**	**0.47**	**0.53**	**0.53**	**0.53**	**0.75**	**0.74**	**0.75**
Fe09b	**0.39**	**0.39**	**0.39**	**0.45**	**0.45**	**0.45**	**0.53**	**0.53**	**0.53**
Ge09	**0.36**	**0.36**	**0.36**	**0.47**	**0.46**	**0.46**	**0.83**	**0.83**	**0.83**
PC08	**0.36**	**0.36**	**0.36**	**0.39**	**0.39**	**0.39**	0.37	0.40	0.40
PC09a*	**0.52**	**0.53**	**0.53**	**0.61**	**0.61**	**0.61**	**0.74**	**0.74**	**0.74**
PC09b	**0.45**	**0.45**	**0.45**	**0.52**	**0.52**	**0.52**	**0.56**	**0.56**	**0.56**
So08	**0.43**	**0.43**	**0.43**	**0.51**	**0.51**	**0.51**	**1.00**	**0.97**	**0.97**
So09*	**0.45**	**0.45**	**0.45**	**0.56**	**0.56**	**0.56**	**0.61**	**0.61**	**0.61**
To09	**0.48**	**0.48**	**0.48**	**0.56**	**0.56**	**0.56**	**0.70**	**0.70**	**0.71**
Mean 08	0.36	0.36	0.36	0.42	0.42	0.42	0.77	0.75	0.75
Mean 09	0.45	0.45	0.45	0.54	0.54	0.54	0.71	0.71	0.71
Mean all	0.41	0.41	0.41	0.48	0.48	0.48	0.71	0.71	0.70

Supplementary Table 4

Estimated asymptotic minimum taxa richness (S_{est}), estimated number of undetected taxa (f_0), and the ratio between observed (S_{obs}) and estimated (S_{est}) taxa richness (Chao et al., 2009) computed for all dead censuses using the minimum, corrected, and maximum number of bivalve individuals (Gilinsky & Bennington, 1994). The corresponding values for living censuses are insensitive to assumptions concerning bivalve sampling. Mean values of 2009 censuses only include GPS coordinates already sampled in 2008 (marked with an asterisk). Mean values across all censuses (n=12) are shown for comparison.

Census	Dead community S_{est}			Dead community f_0			Dead community S_{obs}/S_{est}		
	minimum	corrected	maximum	minimum	corrected	maximum	minimum	corrected	maximum
CS08	86.8	90.0	90.0	13.8	17.0	17.0	0.84	0.81	0.81
CS09*	137.7	140.7	140.7	10.7	13.7	13.7	0.92	0.90	0.90
Fe08	90.1	95.6	95.6	22.1	27.6	27.6	0.76	0.71	0.71
Fe09a*	106.8	109.0	109.0	9.8	12.0	12.0	0.91	0.89	0.89
Fe09b	147.6	162.6	162.6	20.6	35.6	35.6	0.86	0.78	0.78
Ge09	102.4	109.2	109.2	13.4	20.2	20.2	0.87	0.82	0.82
PC08	46.1	56.2	56.2	10.1	20.2	20.2	0.78	0.64	0.64
PC09a*	101.8	121.0	121.0	28.8	48.0	48.0	0.72	0.60	0.60
PC09b	95.1	96.0	96.0	7.1	8.0	8.0	0.93	0.92	0.92
So08	28.3	28.8	28.8	1.3	1.8	1.8	0.96	0.94	0.94
So09*	107.2	112.8	112.8	28.2	33.8	33.8	0.74	0.70	0.70
To09	131.9	151.0	151.0	16.9	36.0	36.0	0.87	0.76	0.76
Mean 08	62.8	67.6	67.6	11.8	16.6	16.6	0.83	0.78	0.78
Mean 09	113.4	120.9	120.9	19.4	26.9	26.9	0.82	0.77	0.77
Mean all	98.5	106.1	106.1	15.2	22.8	22.8	0.85	0.79	0.79

Supplementary Table 5

Literature used to compile habitat information for all taxa. For each reference the number of taxa is provided for which species- and genus-specific habitat information was present. Reference numbers correspond to those used in Supplementary Table 6.

Reference number	Number of taxa with species-specific habitat information	Number of taxa with genus-specific habitat information	Reference
1	28	42	Albano & Sabelli (2011)
2	7	21	Albayrak et al. (2007)
3	8	34	Almeida et al. (2008)
4	21	46	Arroyo et al. (2006)
5	0	24	Avila (2003)
6	3	39	Avila et al. (2007)
7	0	3	Avila et al. (2008)
8	5	19	Bachelet et al. (2000)
9	6	20	Badalamenti et al. (2002)
10	8	13	Bertasi et al. (2007)
11	5	4	Cinar et al. (1998)
12	7	13	Colosio et al. (2007)
13	7	5	Como et al. (2008)
14	0	1	Como & Magni (2009)
15	13	18	Cosentino & Giacobbe (2006)
16	19	24	Cosentino & Giacobbe (2008)
17	5	10	Crocetta & Spanu (2008)
18	23	27	De Biasi et al. (2003)
19	0	1	De Montaudouin et al. (1999)
20	0	1	Dolbeth et al. (2007)
21	3	5	Duineveld et al. (2007)
22	3	1	Fabi et al. (2009)
23	0	3	Frost et al. (1999)
24	46	2	Goto & Poppe (1991)
25	79	0	Goto & Poppe (1993)
26	60	0	Huber (2010)
27	1	7	Kazanci et al. (2003)

28	1	0	Kidwell (2002)
29	0	43	Kilias (1997)
30	1	0	Koukouras & Russo (1991)
31	7	35	Koutsoubas et al. (2000)
32	25	0	Mastrototaro et al. (2008)
33	1	33	Melone & Taviani (1982)
34	33	67	Milazzo et al. (2000)
35	12	24	Mutlu & Ergev (2008)
36	6	23	Nicolaidou et al. (2006)
37	2	1	Peharda et al. (2002)
38	3	14	Ponti et al. (2007)
39	4	5	Reizopoulou & Nicolaidou (2004)
40	1	0	Rossi et al. (2001)
41	19	44	Rueda et al. (2001)
42	12	31	Rueda et al. (2008)
43	28	54	Rueda et al. (2009)
44	7	27	Rueda & Salas (2003)
45	17	37	Rueda & Salas (2008)
46	3	5	Sawyer & Zuschin (2010)
47	15	44	Schirosi et al. (2010)
48	4	4	Semprucci et al. (2010)
49	31	29	Siletic (2006)
50	28	60	Terlizzi et al. (2003)
51	44	66	Terlizzi et al. (2005)
52	1	0	Terlizzi et al. (2008)
53	13	26	Weber & Zuschin (2013)
54	1	0	Yonow (1996)

Supplementary Table 6

Habitat assignments of all taxa. For each taxon, the classification as either indigenous or allochthonous and the number of references with species- and genus-specific habitat information are provided. Reference numbers in the last two columns refer to references given in Supplementary Table 5. In addition, columns three and four provide the habitat type(s) from which a taxon has been reported alive (S=soft substrates, R=rocky substrates, V=vegetation, P=pelagic zone, E=attached to echinoderms, W=wood-boring). If a taxon has been reported alive from more than one habitat type, habitat types are ordered according to the number of references for each of them, with the first being the habitat most often reported, and with equal signs (=) designating habitat types with identical numbers of references. Four taxa (*Ctena decussata*, *Jujubinus exasperatus*, *Musculus costulatus*, *Mytilaster solidus*) classified as allochthonous based on literature data were recovered in the living community – these four taxa were classified as indigenous in all analyses.

Taxon	Classification	Number of species-specific references (habitat types)	Number of genus-specific references (habitat types)	Species-specific references	Genus-specific references
Abra segmentum	indigenous	5 (S)	22 (S, V, R)	18, 25, 26, 38, 40	1, 2, 4, 8, 10, 13, 15, 18, 21, 27, 31, 33, 35, 36, 39, 41, 43, 44, 45, 47, 48, 49
Acanthocardia paucicostata	indigenous	7 (S)	10 (S, V)	2, 25, 26, 32, 41, 43, 49	4, 11, 15, 16, 18, 21, 22, 35, 43, 47
Acanthocardia tuberculata	indigenous	10 (S, V)	8 (S, V)	11, 15, 16, 18, 22, 25, 26, 35, 43, 47	2, 4, 21, 33, 35, 41, 43, 49
Acteon tornatilis	indigenous	4 (S, V)	0	4, 24, 41, 54	-

Alvania cimex	allochthonous	5 (R)	8 (R, S)	1, 9, 24, 50, 51	5, 6, 7, 31, 34, 50, 51, 53
Alvania sp. 1	allochthonous	0	10 (R, S, V)	-	1, 5, 6, 7, 9, 31, 34, 50, 51, 53
Alvania sp. 2	allochthonous	0	10 (R, S, V)	-	1, 5, 6, 7, 9, 31, 34, 50, 51, 53
Anomia ephippium	indigenous	12 (S, V, R)	1 (R)	3, 4, 18, 25, 26, 41, 42, 43, 45, 49, 51, 53	49
Anomiidae sp.	indigenous	0	11 (S, V, R)	-	3, 4, 17, 18, 41, 42, 43, 45, 49, 51, 53
Antalis dentalis	indigenous	1 (S)	2 (S)	25	15, 33
Antalis inaequicostata	indigenous	4 (S)	1 (S)	15, 25, 32, 41	33
Antalis vulgaris	indigenous	3 (S, V)	2 (S)	1, 25, 32	15, 33
Arca noae	allochthonous	6 (R)	2 (R)	25, 26, 34, 49, 50, 51	6, 49
Atlanta peronii	allochthonous	1 (P)	0	24	-
Atys jeffreysi	allochthonous	1 (R)	0	34	-
Barbatia barbata	allochthonous	8 (R, S=V)	2 (R, S)	1, 25, 26, 34, 35, 49, 50, 51	9, 49
Barleeia sp.	allochthonous	0	3 (R)	-	29, 34, 51
Barleeia unifasciata	allochthonous	3 (R)	1 (only depth reported)	24, 34, 51	29
Bittium sp.	indigenous	0	22 (S, V, R)	-	1, 3, 4, 5, 6, 8, 9, 18, 27, 31, 33, 34, 35, 36, 41, 42, 43, 44, 45, 47, 51, 53
Bolinus brandaris	indigenous	3 (S)	0	24, 32, 35	-
Bolma rugosa	allochthonous	4 (V, R=S)	0	1, 4, 34, 42	-
Bornia sebetia	allochthonous	1 (only depth reported)	0	25	-
Bulla striata	indigenous	7 (S, V, R)	0	3, 18, 24, 32, 41, 44, 51	-
Calliostoma conulus	allochthonous	4 (R, V)	13 (S, R=V)	1, 17, 24, 34	4, 6, 16, 17, 29, 34, 41, 42, 43, 44, 45, 50, 51
Calliostoma sp. 1	indigenous	0	14 (R=S=V)	-	1, 4, 6, 16, 17, 29, 34, 41, 42, 43, 44, 45, 50, 51
Calliostoma sp. 2	indigenous	0	14 (R=S=V)	-	1, 4, 6, 16, 17, 29, 34, 41, 42, 43, 44, 45, 50, 51
Callista chione	indigenous	4 (S, V)	0	4, 16, 25, 26	-
Calyptraea chinensis	indigenous	9 (S, V, R)	0	3,4, 16, 24, 32,	-

				41, 42, 43, 45	
Cardita calyculata	allochthonous	7 (R, S)	0	6, 25, 26, 34, 41, 50, 51	-
Cerastoderma glaucum	indigenous	12 (S, V)	3 (S, V)	8, 12, 13, 15, 18, 25, 26, 31, 36, 38, 39, 53	3, 41, 47
Cerithiidae sp. 1	indigenous	0	8 (S, R, V)	-	3, 29, 31, 33, 34, 47, 50, 51
Cerithiidae sp. 2	indigenous	0	8 (S, R, V)	-	3, 29, 31, 33, 34, 47, 50, 51
Cerithiidae sp. 3	indigenous	0	8 (S, R, V)	-	3, 29, 31, 33, 34, 47, 50, 51
Cerithiidae sp. 4	indigenous	0	8 (S, R, V)	-	3, 29, 31, 33, 34, 47, 50, 51
Cerithiidae sp. 5	indigenous	0	8 (S, R, V)	-	3, 29, 31, 33, 34, 47, 50, 51
Cerithiidae sp. 6	indigenous	0	8 (S, R, V)	-	3, 29, 31, 33, 34, 47, 50, 51
Cerithiopsis sp.	allochthonous	0	8 (R, S=V)	-	1, 6, 29, 34, 41, 44, 50, 51
Cerithium vulgatum	indigenous	8 (S, R, V)	5 (R, S)	3, 24, 31, 32, 34, 47, 50, 51	31, 34, 35, 50, 51
Chama gryphoides	allochthonous	6 (R)	0	25, 26, 34, 49, 50, 51	-
Chamelea gallina	indigenous	18 (S, V)	0	2, 4, 10, 12, 15, 16, 18, 21, 22, 25, 26, 35, 41, 43, 45, 47, 48, 53	-
Chauvetia sp.	allochthonous	0	3 (R, V)	-	1, 34, 51
Chrysallida sp.	allochthonous	0	6 (R, S, V)	-	1, 34, 43, 44, 50, 51
Clanculus cruciatus	allochthonous	6 (R, S)	3 (R, S)	1, 24, 34, 47, 50, 51	34, 47, 50
Columbella rustica	allochthonous	5 (R)	1 (R=S)	1, 24, 34, 50, 51	6
Conus mediterraneus	allochthonous	4 (R, V)	0	3, 24, 34, 51	-
Copulabyssia corrugata	unknown	0	0	-	-
Corbula gibba	indigenous	17 (S, V)	0	2, 4, 10, 15, 16, 18, 21, 22, 25, 26, 32, 35, 41, 43, 44, 48, 52	-
Crepidula unguiformis	indigenous	1 (only depth reported)	2 (R=S=V)	24	1, 19
Ctena decussata	allochthonous	5 (R, S, V)	0	25, 34, 49, 50, 51	-
Cyclope neritea	indigenous	11 (S, V)	2 (S)	10, 12, 13, 24,	16, 47

				31, 36, 38, 39, 46, 47, 53	
Cyclope pellucida	indigenous	3 (S)	10 (S, V)	16, 24, 47	10, 12, 13, 31, 36, 38, 39, 46, 47, 53
Diodora gibberula	allochthonous	4 (R)	2 (R, V)	24, 34, 50, 51	1, 29
Diodora graeca	allochthonous	3 (R, V)	3 (R)	1, 24, 34	29, 50, 51
Diplodonta trigona	indigenous	0	2 (S)	-	16, 29
Donacilla cornea	indigenous	3 (S)	0	25, 26, 30	-
Donax semistriatus	indigenous	7 (S)	8 (S, V)	10, 12, 18, 25, 26, 35, 48	8, 15, 16, 18, 35, 43, 45, 53
Donax trunculus	indigenous	5 (S)	10 (S, V)	8, 16, 25, 26, 53	8, 10, 12, 15, 16, 18, 35, 43, 45, 48
Donax variegatus	indigenous	3 (S)	11 (S, V)	18, 25, 26	8, 10, 12, 15, 16, 18, 35, 43, 45, 48, 53
Donax venustus	indigenous	6 (S, V)	8 (S)	15, 16, 25, 26, 43, 45	8, 10, 12, 16, 18, 35, 48, 53
Dosinia lupinus	indigenous	9 (S, V)	0	16, 18, 21, 25, 26, 41, 43, 45, 53	-
Emarginula adriatica	allochthonous	1 (R)	5 (R, V)	17	1, 29, 34, 50, 51
Ennucula aegeensis	allochthonous	1 (S)	0	49	-
Ensis ensis	indigenous	4 (S)	0	15, 16, 25, 26	-
Ensis minor	indigenous	2 (S)	2 (S)	25, 26	15, 16
Epitonium sp. 1	indigenous	0	3 (S=V)	-	4, 35, 43
Epitonium sp. 2	indigenous	0	3 (S=V)	-	4, 35, 43
Epitonium sp. 3	indigenous	0	3 (S=V)	-	4, 35, 43
Eulima glabra	allochthonous	1 (only depth reported)	1 (E)	24	29
Eulima sp.	allochthonous	0	2 (E)	-	24, 29
Euthria cornea	allochthonous	2 (R)	0	1, 24	-
Flexopecten coarctatus	allochthonous	8 (V, S, R)	2 (S, R=V)	1, 4, 25, 26, 42, 43, 45, 49	33, 49
Flexopecten glaber	allochthonous	5 (R, S)	4 (V, S, R)	1, 25, 26, 32, 49	4, 43, 45, 49
Fossarus ambiguus	allochthonous	1 (R)	0	51	-
Fusinus syracusanus	allochthonous	1 (R)	7 (R, S, V)	24	1, 4, 17, 34, 35, 42, 50
Fustiaria rubescens	indigenous	2 (S)	0	25, 32	-
Galeomma turtoni	allochthonous	5 (R, S=V)	1 (R)	1, 25, 49, 50, 51	29
Gari fervensis	indigenous	6 (S, R=V)	3 (S, R=V)	16, 25, 26, 32, 37, 43	1, 43, 49
Gibberula miliaria	allochthonous	6 (R, S=V)	2 (R)	4, 13, 24, 34, 50, 51	34, 51
Gibberula philippii	allochthonous	2 (R)	5 (R, S=V)	34, 51	4, 13, 34, 50, 51

Gibberula sp.	allochthonous	0	5 (R, S=V)	-	4, 13, 34, 50, 51
Gibbomodiola adriatica	allochthonous	2 (V)	0	25, 43	-
Gibbula ardens	indigenous	3 (R=S=V)	15 (S, R, V)	24, 32, 34	3, 4, 5, 6, 8, 9, 18, 31, 33, 34, 35, 36, 41, 47, 51
Gibbula rarilineata	allochthonous	1 (R)	15 (S, R, V)	24	3, 4, 5, 6, 8, 9, 18, 31, 33, 34, 35, 36, 41, 47, 51
Gibbula sp.	indigenous	0	15 (S, R, V)	-	3, 4, 5, 6, 8, 9, 18, 31, 33, 34, 35, 36, 41, 47, 51
Gibbula turbinoides	allochthonous	4 (R)	14 (S, R, V)	24, 34, 50, 51	3, 4, 5, 8, 9, 18, 31, 33, 34, 35, 36, 41, 47, 51
Glans trapezia	indigenous	4 (S, R)	1 (R=S)	25, 32, 49, 51	49
Glycymeris bimaculata	indigenous	2 (S)	1 (S=V)	25, 26	43
Glycymeris nummaria	indigenous	3 (S, V)	0	25, 26, 43	-
Granulina marginata	allochthonous	2 (R=V)	1 (R)	24, 34	34
Haliotis tuberculata lamellosa	allochthonous	4 (R)	1 (R)	1, 24, 50, 51	29
Heliacus contextus	allochthonous	1 (only depth reported)	0	33	-
Hexaplex trunculus	indigenous	7 (S, R, V)	0	4, 24, 34, 35, 50, 51, 53	-
Hiatella arctica	indigenous	11 (R=S, V)	4 (R, S=V)	1, 4, 17, 18, 25, 26, 34, 41, 42, 43, 49	29, 49, 50, 51
Homalopoma sanguineum	allochthonous	4 (R, S=V)	0	1, 24, 47, 50	-
Hydrobia sp. / *Odostomia* sp.	indigenous	0	17 (S, V, R)	-	3, 8, 14, 18, 20, 27, 31, 34, 36, 38, 39, 41, 42, 44, 50, 51, 53
Irus irus	allochthonous	4 (R)	0	25, 26, 50, 51	-
Jujubinus exasperatus	allochthonous	6 (R, V, S)	15 (V, S, R)	1, 17, 24, 34, 50, 51	3, 4, 5, 6, 23, 31, 33, 34, 41, 42, 43, 44, 45, 50, 51
Karnekampia sulcata	allochthonous	1 (R)	1 (only depth reported)	17	29
Lajonkairia substriata	indigenous	1 (only depth reported)	1(R=S)	26	29
Lentidium mediterraneum	indigenous	8 (S)	0	10, 12, 18, 25, 26, 28, 48, 53	-
Lima lima	allochthonous	6 (R, S=V)	3 (R)	1, 25, 26, 34, 49, 50	34, 50, 51

Limaria tuberculata	allochthonous	5 (R, S=V)	2 (R, S)	1, 25, 26, 49, 51	6, 49
Limidae sp.	allochthonous	0	1 (R=V)	-	1
Littorina obtusata	allochthonous	1 (V)	2 (R=S)	24	3, 29
Littorina sp.	allochthonous	1 (V)	2 (R=S)	-	3, 29
Loripes lucinalis	indigenous	12 (S, V)	0	11, 13, 25, 31, 32, 36, 39, 44, 46, 47, 49, 53	-
Lucinella divaricata	indigenous	6 (S, V, R)	0	25, 43, 45, 49, 51, 53	-
Mactra stultorum	indigenous	7 (S)	0	10, 12, 18, 25, 26, 35, 41	-
Mangelia sp.	indigenous	0	7 (S=V, R)	-	1, 4, 15, 42, 43, 50, 51
Melarhaphe neritoides	allochthonous	2 (R=S)	1 (R)	3, 24	29
Mimachlamys varia	allochthonous	6 (R, S=V)	0	18, 25, 26, 32, 34, 49	-
Mitromorpha sp.	allochthonous	0	1 (R=V)	-	6
Modiolus barbatus	allochthonous	8 (R, S, V)	1 (V)	9, 13, 25, 32, 49, 50, 51, 53	43
Muricidae sp. 1	allochthonous	0	7 (R, S, V)	-	4, 17, 29, 34, 47, 50, 51
Muricidae sp. 2	allochthonous	0	7 (R, S, V)	-	4, 17, 29, 34, 47, 50, 51
Muricidae sp. 3	allochthonous	0	7 (R, S, V)	-	4, 17, 29, 34, 47, 50, 51
Muricidae sp. 4	allochthonous	0	7 (R, S, V)	-	4, 17, 29, 34, 47, 50, 51
Muricopsis sp.	allochthonous	0	5 (R, V)	-	1, 17, 34, 50, 51
Musculus costulatus	allochthonous	11 (V, R, S)	2 (S, V)	4, 25, 26, 34, 42, 43, 44, 45, 49, 50, 51	41, 42
Musculus discors	allochthonous	2 (V)	10 (V, S, R)	25, 26	4, 29, 41, 42, 43, 44, 45, 49, 50, 51
Myrtea spinifera	indigenous	2 (S)	0	2, 25	-
Mytilaster marioni	allochthonous	2 (R)	9 (S, R=V)	25, 26	4, 27, 34, 36, 39, 42, 43, 49, 51
Mytilaster minimus	indigenous	10 (S, R=V)	2 (R)	4, 25, 26, 27, 36, 39, 42, 43, 49, 51	34, 49
Mytilaster solidus	allochthonous	2 (R)	9 (S, R=V)	25, 26	4, 27, 34, 36, 39, 42, 43, 49, 51
Mytilus galloprovincialis	indigenous	9 (R=S)	0	18, 25, 26, 32, 47, 49, 50, 51, 53	-

Nassarius cuvierii	indigenous	5 (V, S, R)	20 (S, V, R)	4, 24, 42, 45, 51	3, 6, 12, 15, 16, 18, 31, 33, 34, 35, 41, 42, 43, 44, 45, 46, 47, 50, 51, 53
Nassarius mutabilis	indigenous	6 (S)	20 (S, V, R)	15, 16, 18, 24, 35, 41	3, 4, 6, 12, 16, 18, 31, 33, 34, 35, 41, 42, 43, 44, 45, 46, 47, 50, 51, 53
Nassarius sp.	indigenous	0	23 (S, V, R)	-	1, 3, 4, 6, 12, 15, 16, 18, 29, 31, 33, 34, 35, 41, 42, 43, 44, 45, 46, 47, 50, 51, 53
Natica hebraea	indigenous	3 (S)	4 (S, R)	16, 24, 35	33, 35, 41, 50
Neolepton sp.	allochthonous	0	1 (R)	-	34
Nerita sanguinolenta	allochthonous	0	1 (only depth reported)	-	29
Neverita josephinia	indigenous	4 (S)	0	15, 16, 24, 35	-
Nuculana pella	indigenous	3 (S, V)	0	25, 26, 43	-
Obesotoma laevigata	indigenous	3 (S, V)	3 (S, V)	4, 41, 43	16, 42, 43
Omalogyridae sp. 1	allochthonous	0	4 (R)	-	6, 34, 50, 51
Omalogyridae sp. 2	allochthonous	0	4 (R)	-	6, 34, 50, 51
Pandora inaequivalvis	indigenous	5 (S, V)	0	18, 25, 26, 41, 44	-
Parvicardium scabrum	indigenous	3 (S, V)	15 (S, V, R)	4, 25, 26	1, 5, 6, 11, 18, 27, 33, 34, 41, 42, 43, 44, 45, 49, 51
Parvicardium scriptum	allochthonous	8 (V, R=S)	10 (S, R=V)	1, 4, 25, 26, 42, 43, 45, 51	5, 6, 11, 18, 27, 33, 34, 41, 44, 49
Patella caerulea	allochthonous	1 (R)	3 (R)	24	6, 29, 51
Patella rustica	allochthonous	1 (R)	2 (R)	24	6, 51
Patella ulyssiponensis	allochthonous	2 (R)	1 (R)	24, 51	6
Pecten jacobaeus	indigenous	3 (S, R=V)	1 (S=V)	25, 26, 49	4
Philine sp.	indigenous	0	6 (S, R)	-	18, 24, 34, 36, 41, 51
Phorcus turbinatus	allochthonous	1 (R)	0	24	-
Pinna nobilis	indigenous	3 (S=V)	0	25, 26, 49	-
Pitar rudis	indigenous	9 (S, V)	0	2, 4, 15, 25, 26, 32, 43, 45, 49	-
Polititapes aureus	indigenous	14 (S, V)	1 (S)	3, 4, 8, 10, 11, 18, 25, 26, 32, 36, 41, 43, 44,	35

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Polyplacophora sp.	allochthonous	0	8 (R, S=V)	-	1, 3, 4, 18, 33, 34, 50, 51
Pseudochama gryphina	allochthonous	7 (R)	0	6, 9, 25, 26, 34, 49, 50	-
Puncturella noachina	allochthonous	1 (R)	1 (R)	24	29
Retusa sp.	indigenous	0	2 (R=S=V)	-	34, 43
Retusa truncatula	indigenous	2 (S)	2 (R=S=V)	24, 36	34, 43
Rissoa auriscalpium	allochthonous	1 (R)	21 (S, V, R)	34	1, 2, 3, 4, 5, 6, 9, 29, 31, 34, 36, 38, 41, 42, 43, 44, 45, 47, 50, 51, 53
Rissoa sp. 1	indigenous	0	20 (S, V, R)	-	1, 2, 3, 4, 5, 6, 9, 31, 34, 36, 38, 41, 42, 43, 44, 45, 47, 50, 51, 53
Rissoa sp. 2	indigenous	0	20 (S, V, R)	-	1, 2, 3, 4, 5, 6, 9, 31, 34, 36, 38, 41, 42, 43, 44, 45, 47, 50, 51, 53
Rissoa sp. 3	indigenous	0	20 (S, V, R)	-	1, 2, 3, 4, 5, 6, 9, 31, 34, 36, 38, 41, 42, 43, 44, 45, 47, 50, 51, 53
Rissoa sp. 4	indigenous	0	20 (S, V, R)	-	1, 2, 3, 4, 5, 6, 9, 31, 34, 36, 38, 41, 42, 43, 44, 45, 47, 50, 51, 53
Rissoa sp. 5	indigenous	0	20 (S, V, R)	-	1, 2, 3, 4, 5, 6, 9, 31, 34, 36, 38, 41, 42, 43, 44, 45, 47, 50, 51, 53
Rissoa sp. 6	indigenous	0	20 (S, V, R)	-	1, 2, 3, 4, 5, 6, 9, 31, 34, 36, 38, 41, 42, 43, 44, 45, 47, 50, 51, 53
Rissoa sp. 7	indigenous	0	20 (S, V, R)	-	1, 2, 3, 4, 5, 6, 9, 31, 34, 36, 38, 41, 42, 43, 44, 45, 47, 50, 51, 53
Rissoa sp. 8	indigenous	0	20 (S, V, R)	-	1, 2, 3, 4, 5, 6,

					9, 31, 34, 36, 38, 41, 42, 43, 44, 45, 47, 50, 51, 53
Rissoa variabilis	indigenous	4 (R=S)	21 (S, V, R)	31, 34, 47, 51	1, 2, 3, 4, 5, 6, 9, 29, 31, 34, 36, 38, 41, 42, 43, 44, 45, 47, 50, 51, 53
Rissoa ventricosa	indigenous	2 (R=S)	21 (S, V, R)	9, 47	1, 2, 3, 4, 5, 6, 9, 29, 31, 34, 36, 38, 41, 42, 43, 44, 45, 47, 50, 51, 53
Rissoa violacea	indigenous	4 (S=V, R)	19 (S, R=V)	1, 31, 42, 51	2, 3, 4, 5, 6, 9, 31, 34, 36, 38, 41, 42, 43, 44, 45, 47, 50, 51, 53
Rissoina bruguieri	allochthonous	5 (R)	0	1, 24, 34, 50, 51	-
Rocellaria dubia	allochthonous	6 (R)	0	9, 25, 26, 49, 50, 51	-
Smaragdia viridis	allochthonous	7 (V, S, R)	0	1, 4, 15, 42, 43, 45, 51	-
Solecurtus strigilatus	indigenous	2 (S)	0	25, 26	-
Solemya togata	allochthonous	6 (V, S)	0	13, 25, 26, 32, 43, 45	-
Spisula subtruncata	indigenous	12 (S, V, R)	0	2, 4, 11, 16, 18, 25, 26, 32, 41, 43, 45, 50	-
Spondylus gaederopus	allochthonous	4 (R)	0	25, 26, 49, 51	-
Striarca lactea	allochthonous	8 (R, S=V)	0	1, 25, 26, 34, 35, 49, 50, 51	-
Styliola subula	allochthonous	1 (P)	1 (P)	24	29
Tellimya ferruginosa	indigenous	4 (S, V)	0	16, 18, 25, 43	-
Tellina albicans	indigenous	4 (S)	12 (S, V, R)	15, 18, 25, 47	1, 2, 8, 10, 12, 15, 16, 33, 41, 43, 45, 49
Tellina distorta	indigenous	7 (S, V)	14 (S, V, R)	2, 15, 16, 25, 32, 43, 45	1, 2, 8, 10, 12, 15, 16, 18, 33, 41, 43, 45, 47, 49
Tellina incarnata	indigenous	1 (S)	14 (S, V, R)	25	1, 2, 8, 10, 12, 15, 16, 18, 33, 41, 43, 45, 47, 49
Tellina planata	allochthonous	3 (V, S)	14 (S, V, R)	25, 43, 45	1, 2, 8, 10, 12, 15, 16, 18, 33,

					41, 43, 45, 47, 49
Tellina pulchella	indigenous	3 (S, V)	14 (S, V, R)	16, 25, 43	1, 2, 8, 10, 12, 15, 16, 18, 33, 41, 43, 45, 47, 49
Tellina tenuis	indigenous	7 (S, R)	10 (S, V)	1, 8, 10, 12, 16, 25, 41	2, 8, 15, 16, 18, 33, 43, 45, 47, 49
Tellinidae sp.	indigenous	0	14 (S, V, R)	-	1, 2, 8, 10, 12, 15, 16, 18, 33, 41, 43, 45, 47, 49
Thracia pubescens	indigenous	2 (S)	8 (S, V, R)	25, 26	1, 21, 23, 29, 43, 45, 49, 50
Thracia sp.	indigenous	0	8 (S=V, R)	-	1, 21, 23, 29, 43, 45, 49, 50
Tricolia tenuis	indigenous	9 (S, V, R)	4 (R, S=V)	1, 6, 24, 32, 34, 41, 42, 44, 51	5, 34, 42, 50
Truncatella subcylindrica	allochthonous	2 (R=S)	1 (only depth reported)	24, 47	29
Turbonilla formosa	indigenous	0	5 (S, R)	-	1, 35, 41, 43, 50
Turbonilla hamata	indigenous	0	5 (S, R)	-	1, 35, 41, 43, 50
Venerupis corrugata	indigenous	3 (S, R)	15 (S, V, R)	25, 26, 47	3, 4, 8, 10, 11, 13, 16, 18, 31, 37, 46, 47, 50, 51, 53
Venerupis decussata	indigenous	13 (S, V, R)	5 (S, R=V)	3, 8, 11, 13, 18, 25, 26, 31, 37, 46, 47, 51, 53	4, 10, 16, 47, 50
Venus casina	indigenous	2 (S)	3 (S, R=V)	25, 26	1, 33, 49
Venus verrucosa	indigenous	6 (S, R, V)	0	1, 18, 25, 26, 32, 49	-
Vermetidae sp.	allochthonous	0	5 (R)	-	6, 29, 34, 50, 51
Vexillum savignyi	allochthonous	5 (R, V)	3 (R)	1, 9, 24, 34, 51	34, 50, 51
Weinkauffia turgidula	allochthonous	1 (R)	0	1	-
Xylophaga sp.	allochthonous	1 (W)	0	49	-

Supplementary Table 7

Interannual comparison of live-dead agreement for the four sites sampled in both 2008 and 2009 (PC, Fe, CS and So). Of sites sampled twice in 2009 (PC, Fe), only the first 2009 censuses are included. ΔS = log(rarefied number of dead taxa) – log(number of living taxa) (Olszewski & Kidwell, 2007). S_{obs}/S_{est} denotes the ratio between observed (S_{obs}) and estimated asymptotic minimum (S_{est}) taxa richness (Chao et al., 2009). All comparisons were conducted using linear models in which site and year were included as predictors.

Parameter	Slope, test statistic and *P*-value
Proportion of living taxa found dead	*b*=0.09, *t*=1.4, *P*=0.26
Spearman's rho (all taxa)	*b*=0.09, *t*=2.8, *P*=0.07
Spearman's rho (indigenous taxa)	*b*=0.12, *t*=3.3, *P*=0.047
Spearman's rho (taxa found alive)	*b*=-0.04, *t*=-0.4, *P*=0.79
Ratio of dead to living taxa number (raw data)	*b*=-0.51, *t*=-0.7, *P*=0.51
Ratio of dead to living taxa number (rarefied data)	*b*=-0.51, *t*=-1.5, *P*=0.22
Difference in log of rarefied taxa number (ΔS)	*b*=-0.22, *t*=-1.5, *P*=0.23
Proportion of dead taxa found alive (all taxa)	*b*=0.05, *t*=1.5, *P*=0.23
Proportion of dead taxa found alive (indigenous taxa)	*b*=0.09, *t*=1.9, *P*=0.16
Proportion of dead individuals belonging to taxa found alive (all taxa)	*b*=0.06, *t*=1.0, *P*=0.39
Proportion of dead individuals belonging to taxa found alive (indigenous taxa)	*b*=0.10, *t*=1.5, *P*=0.22
S_{obs}/S_{est} (living community)	*b*=-0.02, *t*=-0.2, *P*=0.87
S_{obs}/S_{est} (dead community)	*b*=-0.00, *t*=-0.0, *P*=0.98

Supplementary Table 8

Comparison of differences between replicate samples of the same sites (Fe09a with Fe09b, and PC09a with PC09b) to differences among sites sampled in 2009 in terms of taxa richness, abundance, and live-dead agreement. Differences between replicates (n=2) were compared to differences between any two sites sampled in 2009 (n=26) using non-parametric Wilcoxon rank sum tests following sequential Bonferroni correction (Holm, 1979). ΔS = log(rarefied number of dead taxa) – log(number of living taxa) (Olszewski & Kidwell, 2007). S_{obs}/S_{est} denotes the ratio between observed (S_{obs}) and estimated asymptotic minimum (S_{est}) taxa richness (Chao et al., 2009).

Parameter	Mean difference ± SE, median difference		Test statistic and *P*-value
	between replicates (n=2)	between sites (n=26)	
Total taxa richness	22.0 ± 9.0, 22.0	25.4 ± 3.2, 24.5	*W*=25, *P*=1.00
Living taxa richness	4.0 ± 4.0, 4.0	5.4 ± 0.7, 4.5	*W*=21, *P*=1.00
Dead taxa richness	22.5 ± 7.5, 22.5	25.5 ± 3.3, 25.0	*W*=25, *P*=1.00
Total abundance	3871.0 ± 1069.0, 3871.0	2425.2 ± 319.0, 1944.5	*W*=39, *P*=1.00
Living abundance	5.5 ± 4.5, 5.5	157.4 ± 18.2, 155.0	*W*=0, *P*=0.41
Dead abundance	3865.5 ± 1064.5, 3865.5	2459.0 ± 328.9, 1984.5	*W*=39, *P*=1.00
Proportion of living taxa found dead	0.06 ± 0.02, 0.06	0.04 ± 0.01, 0.03	*W*=40, *P*=1.00
Spearman's rho (all taxa)	0.08 ± 0.00, 0.08	0.07 ± 0.01, 0.07	*W*=26, *P*=1.00
Spearman's rho (indigenous taxa)	0.08 ± 0.01, 0.08	0.07 ± 0.01, 0.07	*W*=31, *P*=1.00
Spearman's rho (taxa found alive)	0.20 ± 0.02, 0.20	0.12 ± 0.02, 0.11	*W*=43, *P*=1.00

Ratio of dead to living taxa (raw data)	1.84 ± 0.41, 1.84	2.06 ± 0.30, 1.68	*W*=27, *P*=1.00
Ratio of dead to living taxa (rarefied data)	0.45 ± 0.25, 0.45	0.80 ± 0.11, 0.88	*W*=16, *P*=1.00
Difference in log of rarefied taxa number (ΔS)	0.23 ± 0.11, 0.23	0.35 ± 0.04, 0.34	*W*=19, *P*=1.00
Proportion of dead taxa found alive (all taxa)	0.09 ± 0.03, 0.09	0.07 ± 0.01, 0.05	*W*=36, *P*=1.00
Proportion of dead taxa found alive (indigenous taxa)	0.13 ± 0.05, 0.13	0.08 ± 0.01, 0.05	*W*=38, *P*=1.00
Proportion of dead individuals belonging to taxa found alive (all taxa)	0.04 ± 0.02, 0.04	0.18 ± 0.02, 0.15	*W*=2, *P*=0.40
Proportion of dead individuals belonging to taxa found alive (indigenous taxa)	0.05 ± 0.03, 0.05	0.15 ± 0.02, 0.16	*W*=10, *P*=1.00
S_{obs}/S_{est} (living community)	0.14 ± 0.03, 0.14	0.20 ± 0.03, 0.16	*W*=23, *P*=1.00
S_{obs}/S_{est} (dead community)	0.22 ± 0.11, 0.22	0.12 ± 0.02, 0.12	*W*=38, *P*=1.00

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