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### CHONDRICHTHYES CAUGHT DURING THE MEDITS SURVEYS IN ITALIAN WATERS

## I CONDROITTI PESCATI DURANTE LE CAMPAGNE MEDITS NELLE ACQUE ITALIANE

Key-words: fish, trawl survey, biomass, Mediterranean Sea.

**Abstract** – Data on chondrichthyes fished during 16 surveys as part of the MEDITS project carried out from 1994 to 2009 on trawlable bottoms up to 800m depth in all seas around Italy are presented and discussed. From a total of 7 GSAs (10255 hauls) 38 elasmobranch species, including 21 rays and skates, 16 sharks and 1 chimaera, have been identified. Only 10 species occurred in all GSAs, 31 in the Strait of Sicily and 19 in the South Adriatic Sea. The number of species caught per year ranged from 23 to 31.

**Introduction** - Although the contribution of elasmobranchs to the market is low (in Italy during 2008, 1375t were landed, according to IREPA data) the by-catch discarded at sea is high and so the management of these fish needs particular attention above all in order to maintain biodiversity and the functions and services of the ecosystem. The interaction between species and the removal of top predators are crucial for the structure and function of the ecosystems. At present some species are threatened, often as a result of human activities. The main reasons for this is that these fish have a k-strategy life span: they grow slowly, mature at a relatively late age, have few young, low natural mortality rates and a very slow population increase (Hamlett 1999, 2005), they are generally top predators and some are rare. They are an important indicator of resource exploitation and the evolution of the community in an area, particularly where there are important multispecies fisheries. The non-sustainable exploitation of elasmobranchs implies an urgent need for a more systematic approach to the assessment and conservation of elasmobranchs.

Action Plans for the conservation of Cartilaginous Fish in the Mediterranean have been proposed at national and international level (in particular, UNEP MAP RAC/SPA 2003; FAO 1998). But there is an urgent need for our knowledge to be updated and no specific research on elasmobranchs has been financed or carried out for more than a year. Most of the data come from trawl surveys for demersal stock assessment (Relini, 2000 and Relini *et al.*, 2000) or, in the case of pelagic fish, from longline fisheries. Some data were collected during the ELASMOIT project (Relini *et al.*, 2010) supported by the Ministry for the Environment, Land and Sea Protection. There are 72 species present in Italian seas (plus 7 doubtful species) of which one is a chimaera, 41 are sharks and 30 are rays and skates (Vacchi and Serena, 2010). Some species are large, high-speed swimmers, which makes them very difficult to catch by bottom trawling.

At present there is no target fishery for elasmobranchs in Italy. All the landed catch

is a by-catch of other fisheries. As mentioned above, the landed commercial catch in 2008 was 1375t, 63% of which was fished by otter trawlers and 54% were sharks.

**Materials and methods** - Data were collected during the Medits surveys carried out each year from 1994 to 2009 in the 7 GSAs (Geographical SubAreas established by GFCM-FAO in 2001) of Italian seas (Fig. 1) between May and July on all trawlable bottoms between 10m (Posidonia meadows excluded) and 800m depth. The sampling design was random stratified, five strata were established (see Tab. 1) and the number of hauls was proportional to the surface of strata and the position of hauls was the same in all years. The duration of the hauls was one hour at depths more than 200 m and half an hour at depths less than 200 m. The gear had a vertical opening of 2-2.5 m and small cod end (20 mm stretched mesh).

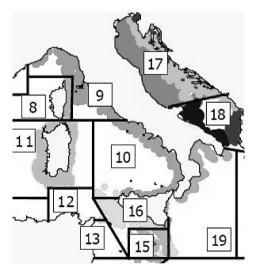


Fig. 1 - The seven Italian GSAs (9, 10, 11, 16, 17, 18, 19). Le sette GSA italiane (9, 10, 11, 16, 17, 18, 19).

Depth strata (m)	GSA9	GSA10	GSA11	GSA16	GSA17	GSA18	GSA19	Total
0-50	283	118	294	106	671	206	144	1822
51-100	304	145	345	208	494	234	128	1858
101-200	554	248	413	165	359	385	160	2284
201-500	606	324	343	281	110	163	233	2060
501-800	437	403	353	345	11	195	487	2231
0-200 (Shelf)	1141	511	1052	479	1524	825	432	5964
200-800 (Slope)	1043	727	696	626	121	358	720	4291
0-800 (Total)	2184	1238	1748	1105	1645	1183	1152	10255

Tab. 1 - The total number of hauls per stratum and GSA.Numero totale di cale per strato e GSA.

For information on gear, protocol of methods and processing of data, see Relini *et al.*, 2008 and the website (www.sibm.it/SITO%20MEDITS/principalemedits.htm).

The number of hauls per GSA is given in Tab. 1 and a total of 10255 were performed during 16 surveys. Estimates of abundance indices (density n/km<sup>2</sup>, biomass kg/km<sup>2</sup>) were based on stratified random sampling and swept area method and were computed for two macrostrata: shelf (10-200 m depth) and slope (200-800 m depth).

For species caught in at least 12 out of 16 campaigns carried out ( $\geq$ 75%) a non-parametric Spearman's rho value was estimated so as to test time trends.

The main references for identification and updated nomenclature are Fisher *et al.* (1987), Serena (2005), Serena *et al.* (2010) and Vacchi & Serena (2010).

The references give record of all the papers published by GSAs on elasmobranchs fished during Medits surveys.

**Results** - During the course of 16 years, 38 species (Tab. 2) including 21 rays and skates, 16 sharks and 1 rabit fish were collected and identified. Only 9 species (including 5 sharks) occurred in all GSAs, and another 10 were present in 6 GSAs.

				GSAs				1	
Species	9	10	11	16	17	18	19	Total	% GSA
Chimaera monstrosa Linnaeus, 1758	*	*	*	*	*	*	8	7	100.0
Galeus melastomus Rafinesque, 1810	*	*	*	*	*	*	*	7	100.0
Scyliorhinus canicula (Linnaeus, 1758)	*	*	*	*	*	*	*	7	100.0
Scyliorhinus stellaris (Linnaeus, 1758)	*	*	*	*	*	*	*	7	100.0
Galeorhinus galeus (Linnaeus, 1758)		*						1	14.3
Mustelus asterias Cloquet, 1821				*	*			2	28.6
Mustelus mustelus (Linnaeus, 1758)	*	*	*	*	*		*	6	85.7
Mustelus punctulatus Risso, 1826				*	*			2	28.6
Heptranchias perlo (Bonnaterre, 1788)	*		*	*			*	4	57.1
Hexanchus griseus (Bonnaterre, 1788)	*	*	*	*				4	57.1
Centrophorus granulosus (Bloch and Schneider, 1801)	*	*	*	*		*		5	71.4
Centrophorus uyato (Rafinesque, 1810)		*		*			*	3	42.9
Dalatias licha (Bonnaterre, 1788)	*	*	*	*	*	*	*	7	100.0
Etmopterus spinax (Linnaeus, 1758)	*	*	*	*	*	*	*	7	100.0
Oxynotus centrina (Linnaeus, 1758)	*	*	*	*	*		*	6	85.7
Squalus acanthias Linnaeus, 1758	*	*	*	*	*	*		6	85.7
Squalus blainvillei (Risso 1826)	*	*	*	*		*	*	6	85.7
Dasyatis centroura (Mitchill, 1815)							*	1	14.3
Dasyatis pastinaca (Linnaeus, 1758)	*	*	*	*	*		*	6	85.7
Pteroplatytrygon violacea (Bonaparte, 1832)		*						1	14.3
Gymnura altavela (Linnaeus, 1758)							*	1	14.3
Myliobatis aquila (Linnaeus, 1758)	*	*	*	*	*	*		6	85.7
Pteromylaeus bovinus (Geoffroy St-Hilarie, 1817)					*		*	2	28.6
Dipturus batis (Linnaeus, 1758)	*							1	14.3
Dipturus oxyrinchus (Linnaeus, 1758)	*	*	*	*			*	5	71.4
Leucoraja circularis (Couch, 1838)	*		*	*	*	*	*	6	85.7
Leucoraja fullonica (Linnaeus, 1758)	*			*		*	*	4	57.1
Leucoraja melitensis (Clark, 1926)				*				1	14.3
Raja asterias Delaroche, 1809	*	*	*	*	*	*	*	7	100.0
Raja brachyura Lafont, 1873			*	*				2	28.6
Raja clavata Linnaeus, 1758	*	*	*	*	*	*		6	85.7
Raja miraletus Linnaeus, 1758	*	*	*	*	*	*	*	7	100.0
Raja montagui Fowler, 1910	*	*		*	*	*	*	6	85.7
Raja polystigma Regan, 1923	*	*	*		*	*		5	71.4
Rostroraja alba Lacépède, 1803				*				1	14.3
Torpedo marmorata Risso, 1810	*	*	*	*	*	*	*	7	100.0
Torpedo nobiliana Bonaparte, 1835	*	*	*	*	*	*	*	7	100.0
Torpedo torpedo (Linnaeus, 1758)	*	*	*	*	*		*	6	85.7
Total species caugth (38)	27	26	25	31	23	19	24		-

Tab. 2 - List of species fished during Medits surveys (1994-2009) in each GSA. Lista delle specie catturate durante le campagne Medits (1994-2009) in ciascuna GSA.

The highest number of species was found in the Strait of Sicily (GSA16: 31 species), the lowest (19 species) in the South Adriatic Sea (GSA18). Eight species including 1

shark were found only in one GSA and three of them during one year only: they are *Galeorhinus galeus* (GSA10, 1995 and 2001), *Dasyatis centroura* (GSA19, 2002) *Pteroplatytrygon violacea* (GSA10, 2000 and 2002), *Gymnura altavela* (GSA19, 2006) *Pteromylaeus bovinus* (GSA17, ten years), *Dipturus batis* (GSA9, 1996) *Leucoraja melitensis* (GSA16, all years excluding 1994 and 2003) and *Rostroraja alba* (GSA16, 1995, 2000, 2003, 2005, 2007, 2008 and 2009).

The number of species caught per year (Tab. 3) was 23 in 1994, 30 in 1995 and fell to 23 in 1997, then increased with some fluctuation to 31 in 2008 and 2009.

Tab. 3 - List of species caught per year in all GSAs.

Lista delle specie catturate ogni anno in tutte le GSA.

								Ye	ars									
Species	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total	% su GSA
Chimaera monstrosa Linnaeus, 1758	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Galeus melastomus Rafinesque, 1810	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Scyliorhinus canicula (Linnaeus, 1758)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Scyliorhinus stellaris (Linnaeus, 1758)		*		*	*		*	*	*			*		*		*	9	56.3
Galeorhinus galeus (Linnaeus, 1758)		*						*									2	12.5
Mustelus asterias Cloquet, 1821									*			*	*		*	*	5	31.3
Mustelus mustelus (Linnaeus, 1758)	*	*	*	*	*	*	8	*	*	*		*	*	*	*	*	16	100.0
Mustelus punctulatus Risso, 1826								*		*	*				*	*	5	31.3
Heptranchias perlo (Bonnaterre, 1788)		*				*			*	*	*	*	*	*	*	*	10	62.5
Hexanchus griseus (Bonnaterre, 1788)	*	*	*		*	*	*	*	*		*		*	*	*	*	13	81.3
Centrophorus granulosus (Bloch and Schneider, 1801)	*	*	*	*	*	*	8	*	*	*	*	*	*	*	*	*	16	100.0
Centrophorus uyato (Rafinesque, 1810)		*					*						*				3	18.8
Dalatias licha (Bonnaterre, 1788)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Etmopterus spinax (Linnaeus, 1758)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Oxynotus centrina (Linnaeus, 1758)	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	15	93.8
Squalus acanthias Linnaeus, 1758	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Squalus blainvillei (Risso 1826)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Dasyatis centroura (Mitchill, 1815)									*								1	6.3
Dasyatis pastinaca (Linnaeus, 1758)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Pteroplatytrygon violacea (Bonaparte, 1832)									*								2	12.5
Gymnura altavela (Linnaeus, 1758)													*				1	6.3
Myliobatis aquila (Linnaeus, 1758)	*	*	*		*	*	*	*	*	*		*		*	*	*	13	81.3
Pteromylaeus bovinus (Geoffroy St-Hilarie, 1817)		*	*	*		*			*		*	*	*		*	*	10	62.5
Dipturus batis (Linnaeus, 1758)			*														1	6.3
Dipturus oxyrinchus (Linnaeus, 1758)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Leucoraja circularis (Couch, 1838)			*	*			*	*		*	*	*	*	*	*	*	11	68.8
Leucoraja fullonica (Linnaeus, 1758)					*	*									*		3	18.8
Leucoraja melitensis (Clark, 1926)		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	15	93.8
Raja asterias Delaroche, 1809	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Raja brachyura Lafont, 1873	*	*	*		*		*	*	*	*	*	*	*	*	*	*	14	87.5
Raja clavata Linnaeus, 1758	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Raja miraletus Linnaeus, 1758	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Raja montagui Fowler, 1910	*	*	*	*	*	*		*	*	*		*	*	*	*	*	16	100.0
Raja polystigma Regan, 1923	*	*	*	*	*	*	8	*	*	*		*	*	*	*	*	16	100.0
Rostroraja alba Lacépède, 1803		*					8			*		*		*	*	*	7	43.8
Torpedo marmorata Risso, 1810	*	*	*	*	*	*	8	*	*	*	*	*	*	*	*	*	16	100.0
Torpedo nobiliana Bonaparte, 1835	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Torpedo torpedo (Linnaeus, 1758)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	100.0
Totale species caught	23	30	27	23	26	26	29	28	30	27	27	29	29	28	31	31		
Percentage of total species (38)	57.5	75.0	67.5	57.5	65.0	65.0	72.5	70.0	75.0	67.5	67.5	72.5	72.5	70.0	77.5	77.5		

With regard to vertical distribution, the presence of species in different strata is reported (Tab. 4). In the last column on the right there are literature data on the vertical distribution of the species. In grey are the Medits data that conflict with the literature data and hence change the known vertical distribution of some species. There is interesting information about *S. stellaris*, *T. marmorata* and *T. torpedo*: whereas previously their vertical distribution was known up to 100 m depth, during the Medits surveys they were collected at more than 500 m depth. Sixteen species were found in all five strata, five in one stratum alone. The highest number of species occurred at the fourth and fifth strata, while the lowest was found at the second stratum, with a difference of five species. Five species were found only on the slope and six only on the shelf.

Species	0-50m	51-100m	101-200m	201-500m	501-800m	Literature depth range (m)
Centrophorus granulosus	*			*	*	150-1400
Centrophorus uyato		*			*	50-1400
Chimaera monstrosa			*	*	*	200-700 (1000)
Dalatias licha				*	*	90-1000
Dasyatis centroura	*					up to 200
Dasyatis pastinaca	*	*	*	*	*	up to 200
Dipturus batis					*	up to 600
Dipturus oxyrinchus	*	*	*	*	*	90-900
Etmopterus spinax	*		*	*	*	100-1000
Galeorhinus galeus				*	*	20-470
Galeus melastomus		*	*	*	*	200-1200
Gymnura altavela				*		up to 60
Heptranchias perlo			*	*	*	50-400 (1000)
Hexanchus griseus				*	*	100-1000
Leucoraja circularis			*	*	*	70-275
Leucoraja fullonica				*	*	30-550
Leucoraja melitensis	*	*	*	*	*	60-600
Myliobatis aquila	*	*	*			semipelagic up to 200
Mustelus asterias	*		*			up to 100
Mustelus mustelus	*	*	*	*	*	up to 450
Mustelus punctulatus	*		*			up to 200
Oxvnotus centrina		*	*	*	*	60-660
Pteromylaeus bovinus	*					semipelagic 100
Pteroplatytrygon violacea	*	*				pelagic 100 (240)
Raja asterias	*	*	*	*	*	up to 200
Raja brachyura	*	*	*	*		up to 200
Raja clavata	*	*	*	*	*	20-700
Raja miraletus	*	*	*	*	*	50-150
Raja montagui	*	*	*	*	*	up to 650
Raja polystigma	*	*	*	*	*	100-400
Rostroraja alba		*		*	*	40-500
Squalus acanthias	*	*	*	*	*	10-700
Squalus blainvillei	*	*	*	*	*	15-720
Scyliorhinus canicula	*	*	*	*	*	up to 550
Scyliorhinus stellaris	*	*	*	*	*	20-100
Torpedo marmorata	*	*	*	*	*	10-100
Torpedo nobiliana.	*	*	*	*	*	10-150
Torpedo torpedo	*	*	*	*	*	70 (+)
	25	23	26	30	30	/0 (+)
N° species per stratum ercentage of total species (38)	25 66	61	68	<u> </u>	30 79	

Tab. 4 -	Species	occurrence	in diffe	rent strata	and lite	erature da	ata reg	garding dept	h range.
	Presenza	a delle specie	nei diver	si strati e a	lati della	letteratura	ı sulla d	distribuzione	batimetrica.

Grey areas represent new data that conflict with the literature Le aree in grigio si riferiscono a dati nuovi discordanti con quelli della letteratura

Data on numbers of individuals and biomass per GSA and year in the shelf (10-200 m) and in the slope (200-800 m) are given in Tabs. 5, 6, 7, 8, in which (when applicable) the Spearman rho values show the trend in each GSA.

The most abundant species on the shelf (Tab. 5) are S. canicula, R. asterias, R. brachyura and R. miraletus.

A clear negative trend occurs for *S. acanthias* in GSA 17, while positive trends are evident for *R. brachyura* (GSA11), *M. mustelus* (GSA16), *R. clavata* (GSA9 and GSA16), *R. miraletus* (GSA11) and *S. blainvillei* (GSA16). In 87 out of 110 series the data are insufficient to calculate the coefficient, in 24 there is no trend, 6 are positive and 1 negative as mentioned above.

# Tab. 5 - Density index (n/km<sup>2</sup>) for shelf stratum (10-200 m depth) per GSA. Medits 1994-2009. Significant Spearman rho values are in bold.

Indici di densità (nlkm<sup>2</sup>) per la piattaforma (10-200 m) e per GSA. Medits 1994-2009. In grassetto i valori del rho di Spearman significativi.

GSA9 GSA11 C. uyato GSA16 C. monstrosa GSA18 D. centroura	1994 1994	1995 1995	1996	1997	1998	1999	2000 0,220	2001	2002	2003	2004	2005	2006	2007	2008	2009 0.076	rho Spearman n.c.
C. uyato GSA16 C. monstrosa GSA18 D. centroura		1995	100.0				0.220										
GSA16 C. monstrosa GSA18 D. centroura		1995															n.c.
C. monstrosa GSA18 D. centroura			1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA18 D. centroura	4.314	1005	1005	100.0	1000	1999			2002	2002	2004	2005	2006	2007		2000	n.c.
D. centroura	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman n.c.
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA19									0.873								n.c.
D. pastinaca	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9											0.303				0.378		n.c.
GSA10		37.654	4.546	0.689	21.420		6.344	8.909				33.237		70.876	15.238	34.319	n.c.
GSA11 GSA16		37.034	4.540	12.000	21.420		0.344	8.909	2.316	0.814	0.785	1.361	0.430	0.400	15.238	0.399	n.c. n.c.
GSA17									0.415	0.222	0.705	1.501	0.150	0.320	1.007	0.577	n.c.
GSA19					1.622		7.440	0.880			6.006	10.985	0.858	0.851	10.485	2.623	n.c.
D. oxyrhincus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
	0.241	2.210	1.076	0.234	0.243	4.220	2.1.42	1.032		0.330	0.007	0.324	2.001	0.326	0.319	0.941	n.c.
GSA11 GSA16	6.234	3.319	1.076	1.791	0.638	4.339	2.143	8.810	0.772	8.373	2.387	2.325	2.801	1.684	2.031	6.898	0.079 n.c.
E.spinax	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA11		3.626					64.690					37.780					n.c.
GSA18														5.274			n.c.
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9			1.438			0.189		0.258		0.242	6.600	6.070		0.237	9.641		n.c.
GSA11 GSA16						0.189		0.404		0.242	6.600	5.870	0.430	0.237	9.641		n.c. n.c.
GSA18							0.485				3.635		0.450				n.c.
H. perlo	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9														0.326			n.c.
GSA16	100.4	1005	1007	1007	1000	1000	2000	2001	2002	2002	2004	2005	2006	1.201	2000	2000	n.c.
L. circularis GSA16	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA18 GSA18												0.460		0.400			n.c. n.c.
L. melitensis	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA16		2.635								4.070	0.785		1.719	0.400	2.009	3.591	n.c.
M. aquila	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
	0.270	0.000	0.717		0.004	1.015	0.550	1.2.17	1.197	0.550				0.410		0.376	n.c.
GSA10 GSA11	0.277	0.698 0.263	0.717		2.824	4.245	2.773 0.529	4.347	0.255	0.778		0.478		1.405	0.996		n.c. n.c.
GSA16	0.277	0.203			1.008		0.329		0.233	4.070		0.478			0.402	1.197	n.c.
GSA17				1.451	0.563	6.407	2.154	3.266	16.878	2.188	1.034	1.408	7.584	0.961	7.125	3.330	0.231
GSA18															0.569		n.c.
M. asterias	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA16 GSA17			<b>—</b>						0.866			0.454	3.009		2.411	0.399	n.c.
M. mustelus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	n.c. rho Spearman
GSA9					0.262	0.263		0.601									n.c.
GSA10													0.402				n.c.
GSA11					0.252												n.c.
	1.438	1.318	12.175 7.363	5.337 8.526	2.547	26.854 2.218	11.259 0.269	3.896 3.859	31.657 15.364	8.953 1.591	29.056 0.207	15.884 20.513	8.597 7.788	8.008 0.801	18.887 6.563	32.320	0.582 -0.143
GSA17 GSA18	0.512	2.091	7.303	8.320		0.371	0.269	0.356	15.564	1.591	0.207	20.515	/./00	0.801	0.303	1.720	-0.143 n.c.
GSA19	1.595	7.590	2.309	6.776	8.111		0.930	0.880	18.566	1.504	0.858	0.738	6.864	27.246	0.855	25.270	-0.004
M. punctulatus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA16								1 1 0 7		0.705	1.571				2.411	0.798	n.c.
GSA17 O. centrina	1994	1995	1996	1997	1998	1999	2000	1.187	2002	2.785 2003	0.414	2005	2006	2007	2008	0.555 2009	n.c. rho Spearman
	0.241	0.469	0.266	1111	1770	1///	2000	2001	2002	2005	2004	2005	2000	0.326	2000	2007	n.c.
GSA11						0.189	0.380		132.238								n.c.
GSA16		1.318											0.430				n.c.
P. bovinus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA17 GSA19		2.577	0.778	0.284 0.847		0.835			0.873		0.858	1.690	2.574		0.855	0.874	n.c. n.c.
P. violacea	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2.574	2007	2008	2009	rho Spearman
GSA10							0.699		0.704								n.c.
R. asterias	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9	1.526	1.680	5.576	2.112	2.367	8.922	2.505	1.080	4.473	8.076	3.227	1.799	0.413	2.016	1.491	0.376	-0.344
GSA10 GSA11	1.744 14.980	1.871 4.654	1.386 6.566	0.666	1.263 7.985	0.545 6.235	2.627 5.858	0.725 4.657	5.908		0.661	2.128 43.059	31.076	18.643	0.756	10.253	n.c. 0.289
	14.980	4.654	6.566	2.668	1.273	6.235 8.951	2.502	4.657	3.088	2.442	5.497	5.446	4.299	39.237	2.411	9.576	0.289
	0.289	0.752	1.555	0.284	0.992	0.810	0.486	1.172	4.253	0.580	0.857	2.166	0.922	0.320	0.844	0.370	0.200
	0.321	0.548			0.934	0.371			0.538	0.536	0.463	0.465	1.726			0.682	n.c.
GSA19		1.715	1.555			0.835	0.930		1.746		0.858	0.738	7.517	3.406	3.393		n.c.
R. brachyura	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA11 GSA16	0.456	1.580	0.432		1.260		0.264	15.076	2.348	15.269	102.858	57.466	35.001	42.956	9.756	44.166	0.754
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	0.430	0.801 2007	4.822 2008	2009	n.c. rho Spearman
		2.629	2.877		2.432	4.091	2.050	5.936	8.885	4.616	4.241	4.861	5.499	8.137	16.758	6.943	0.794
R. clavata	0.963	2.029	2.0//	4.520	2.432	4.091		5.950	0.000	4.010	4.241	4.001					
R. clavata GSA9 GSA10	0.963 0.558 32.738	48.799	30.557	4.520	2.432	0.545	0.553 18.708	53.234	14.450	43.082	47.787	4.001	0.466	39.858	23.598	2.106 38.173	n.c.

(Segue/Follows)

GSA16	8.628	9.223	6.764	16.010	19.099	7.672	20.016	2.597	19.303	24.418	32.983	31.314	61.901	30.429	47.419	37.507	0.829
GSA17	0.020	0.236	0.701	0.284	0.300	0.880	1.347	2.0 7 /	17.505	0.995	0.207	0.894	1.435	0.481	0.913	0.956	0.483
GSA18	0.321		0.451													2.589	n.c.
R. miraletus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9	5.761	7.423	8.028	10.113	10.644	27.746	14.351	6.046	7.540	11.137	5.151	5.623	10.205	8.051	5.541	5.375	-0.318
GSA10	1.744		2.868	3.443		1.415		0.725		1.555		2.165	0.121		0.602	0.646	n.c.
GSA11	13.546	17.900	11.326	22.576	27.663	15.003	12.790	66.283	3.209	34.817		69.189	38.814	56.100	27.652	40.040	0.589
GSA16	66.151	169.965	198.865	381.561	145.152	79.282	290.236	97.399	121.222	90.348	168.055	131.155	165.499	144.537	151.099	246.990	0.047
GSA17			2.383	3.484 0.742	2.397	3.590	0.595	1.818	3.575	2.398 3.464	0.857	3.268	1.677	2.173	1.256	2.612	-0.244
GSA19 R. montagui	1994	1995	1996	1997	1998	0.717 1999	6.510 2000	2001	4.288	2003	2004	2005	4.353 2006	2007	2.564	1.749 2009	n.c. rho Spearman
GSA9	0.722	0.469	0.240	1.441	0.973	2.277	1.794	2001	2.962	0.659	0.909	2003	2000	2007	2008	2009	n.c.
GSA10	0.722	0.407	0.240	1.441	0.775	2.277	1.774	<u> </u>	2.702	0.057	0.505	<u> </u>	0.214				n.c.
GSA16			8.117	20.012	3.820	1.279	3.753	10.389	4.633	3.256	7.068	5.900	2.579	5.205	6.028	5.586	-0.121
GSA17										0.182		0.178					n.c.
R. polystigma	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9												0.972	2.200	4.235	9.264	6.900	n.c.
GSA10								0.668									n.c.
GSA11	15.765	23.788	37.945	31.659	45.179	45.496	33.956	119.790	7.809	44.396	44.720	34.387	60.035	81.235	21.261	19.091	0.141
GSA17						0.246											n.c.
R. alba	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	n.c.
GSA16	1994	1995	1996	1997	1998	1999	2.502	2001	2002	2003	2004	2005	2006	2007	0.402	0.798	n.c.
S. acanthias GSA9	1994	1995	1990	0.234	1998	1999	2000	2001	2002	2003	2004	2003	2006	2007	2008	2009	rho Spearman
GSA9 GSA10	<u> </u>			0.234				l			<u> </u>	<u> </u>	0.690				n.c. n.c.
GSA10 GSA11	<u> </u>			<u> </u>				1.678			<u> </u>	<u> </u>	0.560				n.c. n.c.
GSA17	12.753	50.877	7.403	7.247	387.306	18.549	21.161	20.308	11.331	15.049	14.930	5.457	9.273	7.587	9.106	7.747	-0.368
GSA18	0.321		0.451		2.12.50	0.411											n.c.
S. blainvillei	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9					3.892												n.c.
GSA11	2.724	2.849	1.937	3.382	20.275	99.050	0.577	0.210	10.538	3.115	6.336	0.470	1.680	0.242	2.030	0.276	-0.421
GSA16		6.588	2.706	1.334			1.251		29.340	1.628	21.203	36.306	92.852	58.856	93.633	78.606	0.811
GSA18																0.518	n.c.
S. canicula	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9 GSA10	26.261	15.986	16.807	15.211	16.804	14.514	29.473	14.968	4.273	26.708	13.026	8.864	25.609 0.263	44.933	39.475	28.940	0.279
GSA10 GSA11	0.558	1.123	173.564	197.214	212.531	359,392	201.579	557.129	205.049	335,793	148.576	127.126	0.263	329.751	184.288	0.646	n.c. 0.200
GSA16	33.075	72.466	82.522	129.411	34.378	46.035	35.028	23.376	42.466	18.721	74.604	60.359	105.318	38.837	39.784	72.222	0.021
GSA17	0.266	0.473	10.393	8.187	3.088	13.721	8.370	5.141	4.695	3.656	2.174	3.726	1.615	0.799	2.080	3.325	-0.168
GSA18	5.770	1.274	0.451		0.467	0.960	010110	0.481	11050	01000	0.454	017.00	11010	0.499		010.00	n.c.
GSA19	0.898	0.856		0.899						0.950	1.637	1.779	1.842		0.931	0.919	n.c.
S. stellaris	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9				0.234					0.329								n.c.
GSA10					0.557				1.273					0.627			n.c.
GSA11								0.404									n.c.
GSA16				2.668	1.273		0.270		0.216			0.454					n.c.
GSA17 GSA18	<u> </u>						0.269		0.216			0.402				1.036	n.c.
GSA18 GSA19	<u> </u>			<u> </u>			0.930	<u> </u>			<u> </u>	<u> </u>				1.056	n.c. n.c.
T. marmorata	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9	1.509	1.864	1.492	1.804	1.014	2.767	1.025	0.995	0.982	1.319	1.212	0.324	2000	2.031	1.315	2.030	-0.125
GSA10	3.825		1.137	0.555			0.553		1.273				0.322		0.788		n.c.
GSA11	0.636		1.077	0.180			0.192					0.239		0.726	0.249	0.526	n.c.
GSA16	4.314	3.953	6.764	6.671	1.273	3.836	3.753	2.597	2.316	8.139	1.571	3.177	1.290	4.404	5.224	5.586	-0.047
GSA17		0.292				0.274	0.297	0.310	0.409	0.218	0.287		0.205			0.216	n.c.
		1.504	0.409	0.407	0.403	2.044		2.313	2.564	1.015	1.389	0.465	0.485	0.499	0.944	2.127	0.178
GSA18				0.107					1.591	0.950	1.556	3.362	1.842	0.749	2.538	0.919	-0.291
GSA18 GSA19	3.593	3.422	0.853		2.329	0.717	6.541	1.842		0.550						0.515	1.0
GSA18 GSA19 <b>T. torpedo</b>	3.593 1994		0.853 1996	1997	1998	0.717 <i>1999</i>	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA18 GSA19 <b>T. torpedo</b> GSA9		3.422 1995	0.853			1999	2000 0.546			0.550						0.515	n.c.
GSA18 GSA19 T. torpedo GSA9 GSA10	1994	3.422 1995 1.685	0.853 1996 4.808	1997	1998		2000	2001	2002 0.399	2003	2004 0.606	2005 0.770	2006	2007 0.652	2008 1.708	2009	n.c. n.c.
GSA18 GSA19 <b>T. torpedo</b> GSA9 GSA10 GSA11		3.422 1995	0.853 1996	1997	1998	1999	2000 0.546		2002	2003 4.600	2004	2005 0.770 0.713		2007 0.652 5.092	2008 1.708 1.010	0.515	n.c. n.c. n.c.
GSA18 GSA19 <b>T. torpedo</b> GSA9 GSA10 GSA11 GSA16	1994	3.422 1995 1.685	0.853 1996 4.808	1997	1998	1999	2000 0.546	2001	2002 0.399	2003 4.600 1.628	2004 0.606	2005 0.770	2006	2007 0.652	2008 1.708	2009	n.c. n.c. n.c. n.c.
GSA18 GSA19 <b>T. torpedo</b> GSA9 GSA10 GSA11	1994	3.422 1995 1.685	0.853 1996 4.808	1997	1998	1999	2000 0.546	2001	2002 0.399	2003 4.600	2004 0.606	2005 0.770 0.713	2006	2007 0.652 5.092	2008 1.708 1.010	2009	n.c. n.c. n.c.
GSA18 GSA19 <b>T. torpedo</b> GSA9 GSA10 GSA11 GSA16 GSA17	1994	3.422 1995 1.685	0.853 1996 4.808	1997	1998 0.992	1999 2.830	2000 0.546 0.677	2001	2002 0.399	2003 4.600 1.628 0.218	2004 0.606 0.290	2005 0.770 0.713 0.908	0.537	2007 0.652 5.092 0.400	2008 1.708 1.010 1.206	0.251	n.c. n.c. n.c. n.c. n.c.
GSA18 GSA19 T. torpedo GSA10 GSA11 GSA16 GSA17 GSA19	0.277	3.422 1995 1.685 1.317	0.853 1996 4.808 0.936	<b>1997</b> 0.785	1998 0.992 28.719	1999 2.830 1.670	2000 0.546 0.677 1.860	2001 0.492 19.355	2002 0.399 0.259	2003 4.600 1.628 0.218 5.195	2004 0.606 0.290 3.432	2005 0.770 0.713 0.908 0.845	2006 0.537 9.336	2007 0.652 5.092 0.400 17.778	2008 1.708 1.010 1.206 7.692	0.251	n.c. n.c. n.c. n.c. n.c. n.c. n.c.
GSA18 GSA19 T. torpedo GSA10 GSA10 GSA11 GSA16 GSA17 GSA19 T. nobiliana	0.277	3.422 1995 1.685 1.317	0.853 1996 4.808 0.936	<b>1997</b> 0.785	1998 0.992 28.719	1999 2.830 1.670 1999	2000 0.546 0.677 1.860 2000	2001 0.492 19.355	2002 0.399 0.259 2002	2003 4.600 1.628 0.218 5.195	2004 0.606 0.290 3.432	2005 0.770 0.713 0.908 0.845	2006 0.537 9.336	2007 0.652 5.092 0.400 17.778	2008 1.708 1.010 1.206 7.692	0.251	n.c. n.c. n.c. n.c. n.c. rho Spearman
GSA18 GSA19 T. torpedo GSA10 GSA10 GSA11 GSA16 GSA17 GSA17 T. nobiliana GSA9	0.277	3.422 1995 1.685 1.317 1995	0.853 1996 4.808 0.936 1996	1997 0.785 1997	1998 0.992 28.719 1998	1999 2.830 1.670 1999 0.454	2000 0.546 0.677 1.860 2000 0.256	2001 0.492 19.355 2001	2002 0.399 0.259 2002	2003 4.600 1.628 0.218 5.195 2003	2004 0.606 0.290 3.432	2005 0.770 0.713 0.908 0.845 2005	2006 0.537 9.336 2006	2007 0.652 5.092 0.400 17.778 2007	2008 1.708 1.010 1.206 7.692	0.251	n.c. n.c. n.c. n.c. n.c. <i>n.c.</i> <i>rho Spearman</i> n.c.

The most abundant species On the slope (Tab. 7 and 8) are G. melastomus (GSA9), E. spinax (GSA9), S. canicula (GSA11), R. clavata (GSA11) and D. oxyrhincus (GSA11). In 103 out of 144 series the data are insufficient to calculate the Spearman coefficient; in 29 situations there are no trends, in two there are negative trends for biomass and three for density. There are ten positive trends for biomass and seven for density.

The trends of some common species on the shelf and on the slope in different GSAs are shown in Figs. 2-8. On the slope the biomass of R. clavata and S. canicula is quite different from one GSA to another. The highest values were reached in

### Tab. 6 - Biomass index (kg/km<sup>2</sup>) for shelf stratum (10-200 m depth) per GSA. Medits 1994-2009. Significant Spearman rho values are in bold.

Indici di biomassa(kglkm<sup>2</sup>) per la piattaforma (10-200 m) e per GSA. Medits 1994-2009. In grassetto i valori del rho di Spearman significativi.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9																0.296	n.c.
GSA11							0.022										n.c.
C. uyato	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA16	1.079 1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	n.c.
C. monstrosa GSA18	1994	1995	1990	1997	1998	1999	2000	2001	2002	2003	2004	2005	2000	2007	2008	2009	rho Spearman
D. centroura	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA19									0.087								n.c.
D. pastinaca	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9				1.277							1.759				1.211		n.c.
GSA10 GSA11		27.990	11.011	1.377 18.516	11.441		7.534	6.135				11.119		29,972	9.248	32.415	n.c. n.c.
GSA16		21.550	11.011	10.510	11.441		7.554	0.155	6.061	3.256	0.020	7.057	10.231	0.761	3.617	0.718	n.c.
GSA17									1.844	0.333				0.881			n.c.
GSA19					4.461		14.139	0.792			7.642	8.257	0.264	0.736	2.981	4.762	n.c.
D. oxyrhincus	1994	1995	1996	<b>1997</b>	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9 GSA11	1.373 8.702	5.641	2.001	0.328	0.131 0.950	6.575	2.667	0.186		0.178 10.687	0.833	0.536	5.769	0.052	0.006	3.669	n.c. 0.125
GSA16	0.702	5.041	2.001	1.701	0.950	0.575	2.007	11.245	0.178	10.007	0.055	2.117	5.707	2.290	5.077	10.505	n.c.
E.spinax	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA11		0.596					2.737					4.902					n.c.
G. galeus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA18 G. melastomus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	0.204	2008	2009	n.c.
G. metastomus GSA9	1794	1995	0.324	1997	1990	1999	2000	0.005	2002	2005	2004	2005	2000	2007	2000	2009	rho Spearman
GSA9			0.524			0.057		0.003		0.019	1.056	1.479		0.071	0.190		n.c.
GSA16													0.010				n.c.
GSA18	10-1	10	1055	10	10	10	0.080				0.918	20	20				n.c.
H. perlo	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9 GSA16														0.603			n.c.
L. circularis	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA16														0.080			n.c.
GSA18												0.251					n.c.
L. melitensis	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA16 M. aquila	1994	0.395	1996	1997	1998	1999	2000	2001	2002	0.488	0.232	2005	0.288	0.320	0.362	1.564 2009	n.c. rho Spearman
GSA9	0.243	1995	1990	1337	1330	1,,,,	2000	2001	0.311	2003	2004	2003	2000	0.148	2000	0.113	n.c.
GSA10	012.00	1.012	1.792		3.918	13.301	2.175	5.180	0.011	4.978				10.706		01110	
GSA11	0.802	0.052										0.167					n.c.
GSA16		0.053			2.016		0.925		0.153			0.167			0.796		n.c. n.c.
		0.053								3.500					2.411	2.574	n.c. n.c.
GSA17		0.053		5.708	2.016 0.338	11.631	0.925 4.993	10.146	0.153	3.500 2.823	2.316	2.508	22.527	1.362	2.411 9.900	2.574 8.554	n.c. n.c. 0.033
	1994	0.053	1996	5.708 1997		11.631 1999		10.146			2.316 2004		22.527 2006	1.362	2.411		n.c. n.c. 0.033 n.c.
GSA17 GSA18			1996		0.338		4.993		31.925	2.823		2.508			2.411 9.900 5.275	8.554	n.c. n.c. 0.033
GSA17 GSA18 M. asterias GSA16 GSA17	1994	1995		1997	0.338 1998	1999	4.993 2000	2001	31.925 2002 0.675	2.823 2003	2004	2.508 2005 0.340	2006 2.257	2007	2.411 9.900 5.275 <b>2008</b> 1.929	8.554 2009 0.559	n.c. n.c. 0.033 n.c. <b>rho Spearman</b> n.c. n.c.
GSA17 GSA18 M. asterias GSA16 GSA17 M. mustelus			1996 1996		0.338 1998 1998	1999 1999 1999	4.993	2001	31.925 2002	2.823		2.508 2005	2006		2.411 9.900 5.275 2008	8.554 2009	n.c. n.c. 0.033 n.c. <b>rho Spearman</b> n.c. n.c. <b>rho Spearman</b>
GSA17 GSA18 M. asterias GSA16 GSA17 M. mustelus GSA9	1994	1995		1997	0.338 1998	1999	4.993 2000	2001	31.925 2002 0.675	2.823 2003	2004	2.508 2005 0.340	2006 2.257 2006	2007	2.411 9.900 5.275 <b>2008</b> 1.929	8.554 2009 0.559	n.c. n.c. 0.033 n.c. <i>rho Spearman</i> n.c. <i>n.c.</i> <i>rho Spearman</i> n.c.
GSA17 GSA18 M. asterias GSA16 GSA17 M. mustelus	1994	1995		1997	0.338 1998 1998	1999 1999 1999	4.993 2000	2001	31.925 2002 0.675	2.823 2003	2004	2.508 2005 0.340	2006 2.257	2007	2.411 9.900 5.275 <b>2008</b> 1.929	8.554 2009 0.559	n.c. n.c. 0.033 n.c. <i>rho Spearman</i> n.c. n.c. n.c. n.c.
GSA17           GSA18           M. asterias           GSA16           GSA17           M. mustelus           GSA9           GSA10	1994	1995	<b>1996</b> 3.585	<b>1997</b> <b>1997</b> 4.936	0.338 1998 1998 0.068	<b>1999</b> <b>1999</b> 0.105 15.422	4.993 2000 2000 24.457	2001	31.925 2002 0.675	2.823 2003 2003 16.523	2004 2004 44.605	2.508 2005 0.340	2006 2.257 2006	2007 2007 5.565	2.411 9.900 5.275 <b>2008</b> 1.929	8.554 2009 0.559 2009 21.451	n.c. n.c. 0.033 n.c. <i>rho Spearman</i> n.c. <i>rho Spearman</i> n.c. n.c. n.c. n.c. n.c.
GSA17 GSA18 M. asterias GSA16 GSA17 M. mustelus GSA10 GSA10 GSA11 GSA16 GSA17	<b>1994</b> <b>1994</b> 0.431	1995 1995 0.329	1996	1997 1997	0.338 1998 1998 0.068 0.030	<b>1999</b> <b>1999</b> 0.105 15.422 2.390	4.993 2000 2000	2001 2001 0.075 6.234 1.062	31.925 2002 0.675 2002	2.823 2003 2003	2004	2.508 2005 0.340 2005	2006 2.257 2006 1.609	2007 2007	2.411 9.900 5.275 2008 1.929 2008	8.554 2009 0.559 2009	n.c. n.c. 0.033 n.c. rho Spearman n.c. n.c. n.c. n.c. n.c. n.c. n.c. n.
GSA17 GSA18 M. asterias GSA16 GSA17 M. mustelus GSA10 GSA10 GSA10 GSA16 GSA17 GSA18	<b>1994</b> <b>1994</b> 0.431 0.114	<b>1995</b> <b>1995</b> 0.329 0.311	<b>1996</b> 3.585 2.036	<b>1997</b> <b>1997</b> 4.936 1.947	0.338 1998 1998 0.068 0.030 1.592	<b>1999</b> <b>1999</b> 0.105 15.422	4.993 2000 2000 24.457 0.059	2001 2001 0.075 6.234 1.062 0.082	31.925 2002 0.675 2002 24.476 4.662	2.823 2003 2003 16.523 0.899	<b>2004</b> <b>2004</b> 44.605 0.414	2.508 2005 0.340 2005 25.165 4.062	2006 2.257 2006 1.609 25.319 7.106	2007 2007 5.565 0.292	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731	8.554 2009 0.559 2009 21.451 2.925	n.c. n.c. 0.033 n.c. <i>tho Spearman</i> n.c. n.c. n.c. n.c. n.c. n.c. n.c. n.
GSA17 GSA18 M. asterias GSA16 GSA17 M. musiclus GSA9 GSA10 GSA16 GSA16 GSA17 GSA18 GSA19	1994 1994 0.431 0.114 0.361	1995 1995 0.329	<b>1996</b> 3.585 2.036 0.525	<b>1997</b> <b>1997</b> 4.936 1.947 0.556	0.338 1998 1998 0.068 0.030	<b>1999</b> <b>1999</b> 0.105 15.422 2.390	4.993 2000 2000 24.457 0.059 0.061	2001 2001 0.075 6.234 1.062 0.082 0.076	31.925 2002 0.675 2002 24.476 4.662 4.032	2.823 2003 2003 16.523 0.899 1.506	<b>2004</b> <b>2004</b> 44.605 0.414 0.071	2.508 2005 0.340 2005 25.165 4.062 2.583	2006 2.257 2006 1.609 25.319 7.106 0.858	2007 2007 5.565 0.292 4.852	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731 0.112	8.554 2009 0.559 2009 21.451 2.925 31.277	n.c. n.c. 0.033 n.c. <i>rho Spearman</i> n.c. n.c. n.c. n.c. n.c. 0.741 0.258 n.c. 0.371
GSA17 GSA18 M. asterias GSA16 GSA17 M. mustelus GSA10 GSA10 GSA10 GSA16 GSA17 GSA18	<b>1994</b> <b>1994</b> 0.431 0.114	<b>1995</b> <b>1995</b> 0.329 0.311 1.113	<b>1996</b> 3.585 2.036	<b>1997</b> <b>1997</b> 4.936 1.947	0.338 1998 1998 0.068 0.030 1.592 0.815	1999 1999 0.105 15.422 2.390 1.079	4.993 2000 2000 24.457 0.059	2001 2001 0.075 6.234 1.062 0.082	31.925 2002 0.675 2002 24.476 4.662	2.823 2003 2003 16.523 0.899	<b>2004</b> <b>2004</b> 44.605 0.414	2.508 2005 0.340 2005 25.165 4.062	2006 2.257 2006 1.609 25.319 7.106	2007 2007 5.565 0.292	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731	8.554 2009 0.559 2009 21.451 2.925	n.c. n.c. 0.033 n.c. <i>tho Spearman</i> n.c. n.c. n.c. n.c. n.c. n.c. n.c. n.
GSA17 GSA18 M. asterias GSA16 GSA17 GSA10 GSA10 GSA10 GSA16 GSA17 GSA18 GSA19 M. punctulatus GSA16 GSA17	1994 1994 0.431 0.114 0.361 1994	1995 1995 0.329 0.311 1.113 1995	1996 3.585 2.036 0.525 1996	1997 1997 4.936 1.947 0.556 1997	0.338 1998 0.068 0.030 1.592 0.815 1998	1999 1999 0.105 15.422 2.390 1.079 1999	4.993 2000 2000 24.457 0.059 0.061 2000	2001 2001 0.075 6.234 1.062 0.082 0.076 2001 0.338	31.925 2002 0.675 2002 24.476 4.662 4.032 2002	2.823 2003 2003 16.523 0.899 1.506 2003 3.155	2004 2004 2004 44.605 0.414 0.071 2004 0.942 1.344	2.508 2005 0.340 2005 25.165 4.062 2.583 2005	2006 2.257 2006 1.609 25.319 7.106 0.858 2006	2007 2007 5.565 0.292 4.852 2007	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731 0.112 2008 1.343	8.554 2009 0.559 2009 21.451 2.925 31.277 2009 1.317 0.317	n.c. n.c. 0.033 n.c. <i>rho Spearman</i> n.c. n.c. n.c. n.c. 0.741 0.258 n.c. 0.371 <i>rho Spearman</i> n.c. 0.371
GSA17 GSA18 M. asterias GSA16 GSA17 M. mustelus GSA9 GSA10 GSA11 GSA16 GSA16 GSA17 M. punctulatus GSA16 GSA17 O. centrina	1994 1994 0.431 0.114 0.361 1994 1994	1995 1995 0.329 0.311 1.113 1995	1996 3.585 2.036 0.525 1996 1996	<b>1997</b> <b>1997</b> 4.936 1.947 0.556	0.338 1998 1998 0.068 0.030 1.592 0.815	1999 1999 0.105 15.422 2.390 1.079	4.993 2000 2000 24.457 0.059 0.061	2001 2001 0.075 6.234 1.062 0.082 0.076 2001	31.925 2002 0.675 2002 24.476 4.662 4.032	2.823 2003 2003 16.523 0.899 1.506 2003	2004 2004 44.605 0.414 0.071 2004 0.942	2.508 2005 0.340 2005 25.165 4.062 2.583	2006 2.257 2006 1.609 25.319 7.106 0.858	2007 2007 5.565 0.292 4.852 2007 2007	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731 0.112 2008	8.554 2009 0.559 2009 21.451 2.925 31.277 2009 1.317	n.c. n.c. 0.033 n.c. <i>rho Spearman</i> n.c. n.c. n.c. n.c. 0.741 0.258 n.c. 0.371 <i>rho Spearman</i> n.c. n.c. 1.c. 1.c. 1.c. 1.c. 1.c. 1.c.
GSA17 GSA18 M. asterias GSA16 GSA17 M. mustelus GSA9 GSA10 GSA11 GSA16 GSA17 GSA18 GSA19 M. punctulatus GSA16 GSA17 O. centrina GSA9	1994 1994 0.431 0.114 0.361 1994	1995 1995 0.329 0.311 1.113 1995	1996 3.585 2.036 0.525 1996	1997 1997 4.936 1.947 0.556 1997	0.338 1998 0.068 0.030 1.592 0.815 1998	1999 0.105 15.422 2.390 1.079 1999	4.993 2000 2000 24.457 0.059 0.061 2000 2000	2001 2001 0.075 6.234 1.062 0.082 0.076 2001 0.338	31.925 2002 0.675 2002 24.476 4.662 4.032 2002 2002	2.823 2003 2003 16.523 0.899 1.506 2003 3.155	2004 2004 2004 44.605 0.414 0.071 2004 0.942 1.344	2.508 2005 0.340 2005 25.165 4.062 2.583 2005	2006 2.257 2006 1.609 25.319 7.106 0.858 2006	2007 2007 5.565 0.292 4.852 2007	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731 0.112 2008 1.343	8.554 2009 0.559 2009 21.451 2.925 31.277 2009 1.317 0.317	n.c. n.c. 0.033 n.c. <i>tho Spearman</i> n.c. n.c. n.c. n.c. n.c. n.c. 0.741 0.258 n.c. 0.371 <i>tho Spearman</i> n.c. n.c. n.c. n.c. <i>tho Spearman</i> n.c.
GSA17 GSA18 M. asterias GSA16 GSA17 GSA10 GSA10 GSA10 GSA16 GSA17 GSA18 GSA19 M. punctulatus GSA16 GSA17 O. centrina GSA9 GSA17	1994 1994 0.431 0.114 0.361 1994 1994	1995 1995 0.329 0.311 1.113 1995 0.798	1996 3.585 2.036 0.525 1996 1996	1997 1997 4.936 1.947 0.556 1997	0.338 1998 0.068 0.030 1.592 0.815 1998	1999 1999 0.105 15.422 2.390 1.079 1999	4.993 2000 2000 24.457 0.059 0.061 2000	2001 2001 0.075 6.234 1.062 0.082 0.076 2001 0.338	31.925 2002 0.675 2002 24.476 4.662 4.032 2002	2.823 2003 2003 16.523 0.899 1.506 2003 3.155	2004 2004 2004 44.605 0.414 0.071 2004 0.942 1.344	2.508 2005 0.340 2005 25.165 4.062 2.583 2005	2006 2.257 2006 1.609 25.319 7.106 0.858 2006 2006	2007 2007 5.565 0.292 4.852 2007 2007	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731 0.112 2008 1.343	8.554 2009 0.559 2009 21.451 2.925 31.277 2009 1.317 0.317	п.с. п.с. 0.033 п.с. <i>rho Spearman</i> п.с. п.с. п.с. п.с. п.с. п.с. п.с. п.с
GSA17 GSA18 M. asterias GSA16 GSA17 M. mustelas GSA9 GSA10 GSA11 GSA16 GSA17 GSA18 GSA19 M. punctulatus GSA16 GSA17 O. centrina GSA9	1994 1994 0.431 0.114 0.361 1994 1994	1995 1995 0.329 0.311 1.113 1995	1996 3.585 2.036 0.525 1996 1996	1997 1997 4.936 1.947 0.556 1997	0.338 1998 0.068 0.030 1.592 0.815 1998	1999 0.105 15.422 2.390 1.079 1999	4.993 2000 2000 24.457 0.059 0.061 2000 2000	2001 2001 0.075 6.234 1.062 0.082 0.076 2001 0.338	31.925 2002 0.675 2002 24.476 4.662 4.032 2002 2002	2.823 2003 2003 16.523 0.899 1.506 2003 3.155	2004 2004 2004 44.605 0.414 0.071 2004 0.942 1.344	2.508 2005 0.340 2005 25.165 4.062 2.583 2005	2006 2.257 2006 1.609 25.319 7.106 0.858 2006	2007 2007 5.565 0.292 4.852 2007 2007	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731 0.112 2008 1.343	8.554 2009 0.559 2009 21.451 2.925 31.277 2009 1.317 0.317	n.c. n.c. 0.033 n.c. <i>tho Spearman</i> n.c. n.c. n.c. n.c. n.c. n.c. 0.741 0.258 n.c. 0.371 <i>tho Spearman</i> n.c. n.c. n.c. n.c. <i>tho Spearman</i> n.c.
GSA17 GSA18 M. asterias GSA16 GSA17 GSA10 GSA10 GSA10 GSA10 GSA16 GSA17 GSA18 GSA19 M. punctulatus GSA17 GSA17 GSA16 GSA17 GSA16 GSA11 GSA16 P. bovinus GSA17	1994 1994 0.431 0.114 0.361 1994 0.349	1995 1995 0.329 0.311 1.113 1995 0.798 2.108 1995	1996 3.585 2.036 0.525 1996 0.744 1996	1997 1997 4.936 1.947 0.556 1997 1997 0.256	0.338 1998 0.068 0.030 1.592 0.815 1998 1998	1999 1999 0.105 15.422 2.390 1.079 1999 1999 0.491 1999	4.993 2000 2000 24.457 0.059 0.061 2000 1.815	2001 2001 0.075 6.234 1.062 0.082 0.076 2001 0.338 2001	31.925 2002 0.675 2002 24.476 4.662 4.032 2002 2002 1.611 2002	2.823 2003 2003 16.523 0.899 1.506 2003 3.155 2003	2004 2004 44.605 0.414 0.071 2004 0.942 1.344 2004 2004	2.508 2005 2005 2005 25.165 4.062 2.583 2005 2005 2005	2006 2.257 2006 1.609 25.319 7.106 0.858 2006 2006 1.075 2006	2007 2007 5.565 0.292 4.852 2007 0.176	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731 0.112 2008 1.343 2008 2008	8.554 2009 0.559 2009 21.451 2.925 31.277 2009 1.317 0.317 2009 2009	n.c. n.c. 0.033 n.c. <i>rho Spearman</i> n.c. n.c. n.c. n.c. 0.741 0.258 n.c. 0.371 <i>rho Spearman</i> n.c. n.c. <i>rho Spearman</i> n.c. n.c. n.c. n.c. n.c. n.c.
GSA17           GSA18           M. asterias           GSA16           GSA17           M. mustelus           GSA9           GSA10           GSA11           GSA16           GSA11           GSA16           GSA17           GSA18           GSA16           GSA17           GSA18           GSA19           M. punctulatus           GSA17           O. centrina           GSA11           GSA16           P. bovinus           GSA17           GSA16	1994 1994 0.431 0.114 0.361 1994 0.349 1994	1995 1995 0.329 0.311 1.113 1995 2.108 2.108 6.012	1996 3.585 2.036 0.525 1996 0.744 1996 0.744	1997 1997 4.936 1.947 0.556 1997 1997 1997 0.256 1.694	0.338 1998 0.068 0.030 1.592 0.815 1998 1998	1999 1999 0.105 15.422 2.390 1.079 1999 0.491 1999 4.509	4.993 2000 24.457 0.059 0.061 2000 1.815 2000	2001 2001 0.075 6.234 1.062 0.082 0.076 2001 0.338 2001 2001	31.925 2002 0.675 2002 24.476 4.662 2002 2002 1.611 2002 3.318	2.823 2003 2003 16.523 0.899 1.506 2003 3.155 2003 2003	2004 2004 44.605 0.414 0.071 2004 0.942 1.344 2004 2004 1.793	2.508 2005 0.340 2005 25.165 4.062 2.583 2005 2005 2.005 2.005	2006 2.257 2006 1.609 25.319 7.106 0.858 2006 2006 1.075 2006 2.227	2007 2007 5.565 0.292 4.852 2007 0.176 2007	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731 0.112 2008 1.343 2008 1.003	8.554 2009 0.559 2009 21.451 2.925 31.277 2009 1.317 2009 2009 1.118	п.с. п.с. 0.033 п.с. <i>rho Spearman</i> п.с. п.с. п.с. п.с. п.с. 0.741 0.258 п.с. 0.371 <i>rho Spearman</i> п.с. п.с. п.с. <i>rho Spearman</i> п.с. п.с. п.с. <i>rho Spearman</i>
GSA17 GSA18 M. asterias GSA16 GSA17 M. mustelias GSA9 GSA10 GSA11 GSA16 GSA17 GSA18 GSA16 GSA17 O. centrina GSA16 GSA17 O. centrina GSA11 GSA16 P. bovinus GSA17 P. biolacea	1994 1994 0.431 0.114 0.361 1994 0.349	1995 1995 0.329 0.311 1.113 1995 0.798 2.108 1995	1996 3.585 2.036 0.525 1996 0.744 1996	1997 1997 4.936 1.947 0.556 1997 1997 0.256	0.338 1998 0.068 0.030 1.592 0.815 1998 1998	1999 1999 0.105 15.422 2.390 1.079 1999 1999 0.491 1999	4.993 2000 2000 24.457 0.059 0.061 2000 1.815 2000 2000 2000	2001 2001 0.075 6.234 1.062 0.082 0.076 2001 0.338 2001	31.925 2002 0.675 2002 24.476 4.662 4.032 2002 2002 1.611 2002 3.318 2002	2.823 2003 2003 16.523 0.899 1.506 2003 3.155 2003	2004 2004 44.605 0.414 0.071 2004 0.942 1.344 2004 2004	2.508 2005 2005 2005 25.165 4.062 2.583 2005 2005 2005	2006 2.257 2006 1.609 25.319 7.106 0.858 2006 2006 1.075 2006	2007 2007 5.565 0.292 4.852 2007 0.176	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731 0.112 2008 1.343 2008 2008	8.554 2009 0.559 2009 21.451 2.925 31.277 2009 1.317 0.317 2009 2009	п.с. п.с. 0.033 п.с. <i>rho Spearman</i> п.с. п.с. п.с. п.с. п.с. 0.741 0.258 п.с. 0.371 <i>rho Spearman</i> п.с. п.с. <i>rho Spearman</i> п.с. п.с. п.с. <i>rho Spearman</i>
GSA17 GSA18 M. asterias GSA16 GSA17 GSA10 GSA10 GSA10 GSA16 GSA17 GSA18 GSA18 GSA18 GSA17 O. centrina GSA16 GSA17 GSA16 GSA17 GSA16 GSA17 GSA17 GSA17 GSA19 P. bovinus GSA17 GSA19 P. violacea GSA10	1994 1994 0.431 0.114 0.361 1994 1994 1994	1995 1995 0.329 0.311 1.113 1995 0.798 2.108 1995 6.012 1995	1996 3.585 2.036 0.525 1996 0.744 1996 0.933 1996	1997 1997 4.936 1.947 0.556 1997 1997 1997 0.256 1.694 1997	0.338 1998 0.068 0.030 1.592 0.815 1998 1998 1998	1999 1999 0.105 15.422 2.390 1.079 1999 1999 0.491 1999 4.509 1999	4.993 2000 2000 24.457 0.059 0.061 2000 1.815 2000 2000 4.018	2001 2001 0.075 0.234 1.062 0.082 0.076 2001 0.338 2001 2001 2001	31.925 2002 0.675 2002 24.476 4.662 4.032 2002 2002 1.611 2002 3.318 2002 1.337	2.823 2003 2003 16.523 1.506 2003 3.155 2003 2003 2003	2004 2004 44.605 0.414 0.071 2004 0.942 1.344 2004 2004 1.793 2004	2.508 2005 25.165 2.583 2005 2005 2005 2.403 2005	2006 2.257 2006 1.609 2.5319 7.106 2006 2006 2006 2.227 2006	2007 2007 5.565 0.292 2007 2007 0.176 2007 2007	2.411 9.900 5.275 2008 2008 2008 2008 1.323 2008 2008 2008 2008	8.554 2009 0.559 2009 21.451 2.925 31.277 2009 31.277 2009 2009 2009	п.с. п.с. 0.033 п.с. <i>rho Spearman</i> п.с. п.с. п.с. п.с. 0.741 0.258 п.с. 0.371 <i>rho Spearman</i> п.с. <i>rho Spearman</i> п.с. п.с. <i>rho Spearman</i> п.с. п.с. п.с. <i>rho Spearman</i> п.с. п.с. п.с. <i>rho Spearman</i>
GSA17           GSA18           M. asterias           GSA16           GSA17           M. mustelus           GSA10           GSA10           GSA11           GSA16           GSA11           GSA16           GSA17           GSA18           GSA16           GSA17           GSA18           GSA19           GSA11           GSA17           O. centrina           GSA11           GSA16           P. bovinus           GSA17           GSA18           GSA19           GSA11           GSA12           GSA11           GSA16           P. violacea           GSA10           R. asterias	1994 1994 0.431 0.114 0.361 1994 0.349 1994 1994 1994	1995 1995 0.329 0.311 1.113 1995 0.798 2.108 1995 6.012 1995	1996 3.585 2.036 0.525 1996 0.744 1996 0.933 1996	1997 1997 4.936 1.947 0.556 1997 1997 1997 1997 1997 1997	0.338 1998 0.068 0.030 1.592 0.815 1998 1998 1998 1998	1999 1999 0.105 15.422 2.390 1.079 1999 0.491 1999 4.509 1999 1999	4.993 2000 2000 24.457 0.059 0.061 2000 1.815 2000 4.018 2000	2001 2001 0.075 6.234 1.062 2000 0.076 2001 2001 2001 2001 2001	31.925 2002 2002 24.476 4.662 2002 2002 2002 1.611 2002 3.318 2002 1.337 2002	2.823 2003 2003 2003 16.523 0.899 1.506 2003 2003 2003 2003	2004 2004 44.605 0.414 0.071 2004 0.942 1.344 2004 1.793 2004 2004	2.508 2005 0.340 2005 25.165 4.062 2.583 2005 2005 2.403 2005 2.403 2005	2006 2.257 2006 25.319 7.106 0.858 2006 2006 2.227 2006 2.227 2006	2007 2007 5.565 0.292 4.852 2007 0.176 2007 2007 2007	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731 2008 1.343 2008 2008 2008 2008	8.554 2009 0.559 2009 21.451 2.925 31.277 2009 1.317 2009 2009 2009 2009 2009	п.с. п.с. 0.033 п.с. <i>rho Spearman</i> п.с. п.с. п.с. п.с. 0.741 0.258 п.с. 0.754 п.с. 0.371 <i>rho Spearman</i> п.с. п.с. <i>rho Spearman</i> п.с. п.с. п.с. <i>rho Spearman</i> п.с. п.с. <i>rho Spearman</i>
GSA17 GSA18 M. asterias GSA16 GSA17 GSA10 GSA10 GSA10 GSA16 GSA17 GSA18 GSA18 GSA18 GSA17 O. centrina GSA16 GSA17 GSA16 GSA17 GSA16 GSA17 GSA17 GSA17 GSA19 P. bovinus GSA17 GSA19 P. violacea GSA10	1994 1994 0.431 0.114 0.361 1994 1994 1994	1995 1995 0.329 0.311 1.113 1995 0.798 2.108 1995 6.012 1995	1996 3.585 2.036 0.525 1996 0.744 1996 0.933 1996	1997 1997 4.936 1.947 0.556 1997 1997 1997 0.256 1.694 1997	0.338 1998 0.068 0.030 1.592 0.815 1998 1998 1998	1999 1999 0.105 15.422 2.390 1.079 1999 1999 0.491 1999 4.509 1999	4.993 2000 2000 24.457 0.059 0.061 2000 1.815 2000 2000 4.018	2001 2001 0.075 6.234 1.062 0.082 2001 2001 2001 2001 2001 1.100	31.925 2002 0.675 2002 24.476 4.662 4.032 2002 2002 1.611 2002 3.318 2002 1.337	2.823 2003 2003 16.523 1.506 2003 3.155 2003 2003 2003	2004 2004 44.605 0.414 0.071 2004 0.942 1.344 2004 2004 1.793 2004	2.508 2005 0.340 2005 25.165 4.062 2.583 2005 2005 2005 2.403 2005 2.403 2005 2.403	2006 2.257 2006 1.609 2.5319 7.106 2006 2006 2006 2.227 2006	2007 2007 5.565 0.292 2007 2007 0.176 2007 2007	2.411 9.900 5.275 2008 2008 2008 2008 1.323 2008 2008 2008 2008	8.554 2009 0.559 2009 21.451 2.925 31.277 2009 31.277 2009 2009 2009	п.с. п.с. 0.033 п.с. <i>rho Spearman</i> п.с. п.с. п.с. п.с. 0.741 0.258 п.с. 0.371 <i>rho Spearman</i> п.с. <i>rho Spearman</i> п.с. п.с. <i>rho Spearman</i> п.с. п.с. п.с. <i>rho Spearman</i> п.с. п.с. п.с. <i>rho Spearman</i>
GSA17           GSA18           M. asterias           GSA16           GSA16           GSA17           M. mustelus           GSA10           GSA11           GSA16           GSA11           GSA16           GSA17           GSA18           GSA16           GSA17           GSA18           GSA19           GSA17           GSA18           GSA17           GSA11           GSA17	1994 1994 0.431 0.114 0.361 1994 1994 1994 1994 1994 1.052 0.305	1995 1995 0.329 0.311 1.113 1995 2.108 2.108 1995 6.012 1995 1.043 1.188 4.765	1996 3.585 2.036 0.525 1996 0.744 1996 0.744 1996 0.933 1996 0.765 6.882	1997 1997 4.936 1.947 0.556 1997 1997 1997 0.256 1.694 1997 1.329 0.999 0.999	0.338 1998 1998 0.068 0.030 1.592 0.815 1998 1998 1998 1998 1998 2.261 1.289 2.2595	1999 1999 0.105 2.330 115.422 2.390 110.79 1999 0.491 1999 1999 1999 3.458 0.009	4.993 2000 24.457 0.059 0.061 2000 2000 1.815 2000 1.815 2000 1.815 2000 1.815 2000	2001 2001 0.075 6.234 1.062 2.001 2.001 2.001 2.001 2.001 1.100 1.449 3.627	31.925 2002 2002 2002 2002 2002 2002 2002 2	2.823 2003 2003 2003 16.523 0.899 1.506 2003 3.155 2003 2003 2003 2003 3.988	2004 2004 44.605 0.414 0.071 1.304 2004 2004 2004 1.793 2004 2004 1.132 2004	2.508 2005 0.340 2005 2.5.165 2.583 2005 2.005 2.005 2.005 2.005 2.005 2.005 2.005	2006 2.257 2006 1.609 25.319 7.106 0.858 2006 2006 2.227 2006 2.227 2006 0.050 20.050	2007 2007 5.565 0.292 4.852 2007 0.176 2007 2007 2007 1.158 11.362	2.411 9.900 5.275 2008 1.929 24.654 3.731 0.112 2008 1.343 2008 2008 2008 2008 1.003 2008 2008	8.554 2009 0.559 2009 21.451 21.451 2.925 31.277 2009 1.317 2009 2009 2009 0.143 9.722	п.с. п.с. 0.033 п.с. <i>rho Spearman</i> п.с. п.с. п.с. п.с. п.с. 0.741 0.258 п.с. 0.371 <i>rho Spearman</i> п.с. п.с. <i>rho Spearman</i> п.с. п.с. <i>rho Spearman</i> п.с. п.с. <i>rho Spearman</i> п.с. <i>rho Spearman</i> п.с. <i>rho Spearman</i> п.с. п.с.
GSA17 GSA18 M. asterias GSA16 GSA17 M. mustelus GSA10 GSA10 GSA16 GSA17 GSA18 GSA18 GSA18 GSA18 GSA16 GSA17 O. centrina GSA16 GSA17 GSA16 GSA17 GSA16 GSA17 GSA17 GSA16 GSA17 GSA17 GSA16 GSA17 GSA16 GSA17 GSA17 GSA17 GSA16 GSA17 GSA17 GSA17 GSA17 GSA17 GSA17 GSA17 GSA17 GSA17 GSA17 GSA18 GSA17	1994 1994 0.431 0.114 0.361 1994 1994 1994 1994 1994 1994 0.349	1995 1995 0.329 0.311 1.113 1995 0.798 2.108 1995 1995 1.043 1.188	1996 3.585 2.036 0.525 1996 0.744 1996 0.933 1996 1996 1996 3.329 0.765	1997 1997 4.936 1.947 0.556 1997 1997 1997 1997 1.359 0.999	0.338 1998 1998 0.068 0.030 1.592 0.815 1998 1998 1998 1998 1998 1998	1999 1999 0.105 15.422 2.390 1.079 1999 0.491 1999 4.509 1999 3.458 0.009	4.993 2000 2000 24.457 0.059 0.061 2000 1.815 2000 4.018 2000 1.670 1.899	2001 2001 0.075 6.234 1.062 2001 0.082 0.082 0.082 0.082 0.082 0.082 0.038 2001 2001 2001 1.100 1.100	31,925 2002 2002 24,476 4,662 4,032 2002 2002 2002 2002 1,611 3,318 2002 1,337 2002 1,937	2.823 2003 2003 2003 16.523 0.899 1.506 2003 2003 2003 2003	2004 2004 44.605 0.414 0.071 2004 2004 2004 1.324 2004 1.324 2004	2.508 2005 0.340 2005 25.165 4.062 2.583 2005 2005 2.403 2005 2.403 2005 2.403 2005	2006 2.257 2006 25.319 7.106 0.858 2006 2006 2.227 2.207 2.2006 0.050	2007 2007 5.565 0.292 4.852 2007 0.176 2007 2007 1.158	2.411 9.900 5.275 2008 1.929 2008 24.654 3.731 0.112 2008 1.343 2008 2008 2008 2008 1.1003 2008	8.554 2009 0.559 2009 21.451 2.925 31.277 2009 1.317 2009 1.317 2009 2009 0.143	п.с. п.с. 0.033 п.с. <i>rho Spearman</i> п.с. п.с. п.с. п.с. п.с. п.с. 0.741 0.258 п.с. 0.371 <i>rho Spearman</i> п.с. п.с. <i>rho Spearman</i> п.с. п.с. <i>rho Spearman</i> п.с. п.с. <i>rho Spearman</i>

(Segue/Follows)

GSA18	0.105	0.400			2.077	0.214			0.020	0.054	0.434	0.050	0.693			0.341	n.c.
GSA19	0.105	1.288	1.400		2.017	1.002	0.886		0.306	0.001	0.955	0.072	6.385	0.867	3.431	0.5 11	n.c.
R. brachyura	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA11	2.303	0.606	2.332		1.386		0.397	7.755	1.325	7.952	2.612	22.555	11.461	13.222	5.032	22.713	0.763
GSA16 R. clavata	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	0.774 2006	1.902	4.139 2008	2009	n.c. rho Spearman
GSA9	0.703	1.922	2.131	8.877	2.785	4.048	3.844	3.783	7.990	9.628	4.257	3.027	5.254	5.418	10.336	6.388	0.650
GSA10	0.017	1.722	2.151	0.077	2.765	0.392	0.020	5.705	7.550	7.020	4.201	5.027	0.657	5.410	10.550	2.224	n.c.
GSA11	13.807	25.218	29.900	23.931	17.836	27.972	17.992	54.311	11.408	35.133	37.690		38.938	27.354	19.183	28.549	0.336
GSA16	15.747	3.426	6.899	10.540	17.444	12.404	31.025	2.208	32.742	21.364	29.114	31.312	57.415	24.940	32.598	40.025	0.759
GSA17		0.274		0.014	0.120	2.418	1.454			0.740	0.004	0.735	3.156	0.530	1.753	1.284	0.420
GSA18 R. miraletus	0.571 1994	1995	0.812	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2.087 2009	n.c. rho Spearman
GSA9	1.304	1.881	1.571	2.579	2.374	3.566	3.329	1.429	1.836	3.015	1.197	1.027	2.369	1.663	1.300	1.215	-0.385
GSA10	0.698		0.072	0.138	21071	0.071	01023	0.029	11000	0.078		0.321	2.413	11000	0.181	0.168	n.c.
GSA11	1.902	2.090	2.100	5.017	4.840	2.236	2.316	9.992	0.907	5.900		10.763	6.249	7.625	4.978	6.174	0.639
GSA16	8.700	13.110	28.612	47.295	22.919	14.642	30.838	25.752	21.728	16.346	31.181	20.331	28.973	21.344	30.300	49.314	0.412
GSA17			0.511	0.999	0.402	0.300	0.027	0.250	0.131	0.298	0.133	0.490	0.209	0.508	0.202	0.397	-0.262
GSA19 R. montagui	1994	1995	1996	0.152 1997	1998	0.359	0.126	0.505	0.179 2002	0.104 2003	0.226	1.009 2005	0.345	2007	0.138	0.066	n.c. rho Spearman
GSA9	0.157	0.471	0.024	2.004	0.146	0.768	0.682	2001	0.609	0.152	0.106	2005	2000	2007	2000	2007	n.c.
GSA10	01107		01021	21001	01110	01100	01002		01003	01101	01100		0.657				n.c.
GSA16			1.420	2.135	0.764	0.384	2.565	2.877	1.523	1.343	1.999	2.494	1.096	1.822	1.973	2.390	0.204
GSA17										0.135		0.004					n.c.
R. polystigma	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9 GSA10								0.160				0.175	0.418	0.848	2.364	2.051	n.c.
GSA10 GSA11	4.301	4.609	16.954	5.863	13.880	13.893	8.231	31.396	1.622	9.644	14.037	9.452	12.292	26.215	5.440	5.035	0.115
GSA17						0.017											n.c.
R. alba	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA16	100.4	1005	1007	1007	1000	1000	5.442	2001	2002	2002	2004	2005	2007	2007	0.100	4.230	n.c.
S. acanthias GSA9	1994	1995	1996	<b>1997</b> 1.240	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9 GSA10				1.240									1.314				n.c.
GSA11 GSA11								1.028			0.700		1.514				n.c.
GSA17	10.061	22.173	5.883	5.422	303.940	19.785	17.402	5.265	8.502	8.893	7.563	3.166	7.816	3.268	6.093	5.138	-0.562
GSA18	1.118		0.572			0.085											n.c.
S. blainvillei	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9 GSA11	2.724	2.072	0.506	8.351	0.973	10.613	0.719	0.514	6.856	2.252	6.600	0.493	0.678	0.073	0.951	0.055	n.c. -0.491
GSA16	2.724	2.072	1.488	0.667	2.403	10.015	0.250	0.514	19.226	1.628	10.013	15.997	29.188	26.245	45.121	35.421	0.839
GSA18		21012	11100	01007			01200		171220	11020	101015	101777	271100	201210	101121	3.676	n.c.
S. canicula	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9	3.158	2.651	2.705	3.089	2.745	2.735	3.401	2.906	0.871	4.939	2.360	1.415	3.059	6.552	5.191	4.637	0.344
GSA10	0.140	0.309							0.267				0.657			0.097	n.c.
GSA11 GSA16	16.461	11.545	19.970 17.249	15.017	23.431	28.516 9.591	21.660	45.499 6.597	25.290 9.743	27.262	17.134	14.825	16.833	69.347	19.098	16.623	0.174
GSA10 GSA17	7.406	13.834 0.161	1.716	25.615	7.894	2.336	9.258 1.365	0.832	0.941	4.612	15.551 0.323	11.391 0.469	14.447 0.689	8.646 0.264	8.866 0.451	13.410 0.544	-0.050
GSA18	0.718	0.226	0.021	1.052	0.211	0.418	1.505	0.133	0.741	0.727	0.136	0.402	0.007	0.006	0.451	0.544	n.c.
GSA19	0.449	0.214		0.005						0.321	0.675	0.662	0.536		0.306	0.339	n.c.
S. stellaris	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9				0.983					1.645								n.c.
GSA10					0.167			0.020	0.038					2.384			n.c.
GSA11 GSA16	<u> </u>							0.030									
				1.668	5.093							0.045					n.c.
GSA17				1.668	5.093		0.037		0.078			0.045					n.c.
GSA17 GSA18				1.668	5.093		0.037		0.078							0.054	
GSA18 GSA19							0.015					0.056					n.c. n.c. n.c. n.c.
GSA18 GSA19 T. marmorata	1994	1995	1996	1997	1998	1999	0.015 2000	2001	2002	2003	2004	0.056 2005	2006	2007	2008	2009	n.c. n.c. n.c. <i>rho Spearman</i>
GSA18 GSA19 <b>T. marmorata</b> GSA9	0.327	<b>1995</b> 0.245	0.183	<b>1997</b> 0.520		<b>1999</b> 0.839	0.015 2000 0.208	<i>2001</i> 0.161	<b>2002</b> 0.221	<b>2003</b> 0.142	<b>2004</b> 0.258	0.056		<b>2007</b> 0.342	0.101		n.c. n.c. n.c. <i>rho Spearman</i> -0.204
GSA18 GSA19 <b>T. marmorata</b> GSA9 GSA10	0.327 0.324		0.183 0.284	<b>1997</b> 0.520 0.166	1998		0.015 2000 0.208 0.553		2002			0.056 2005 0.039	<b>2006</b> 0.804	0.342	0.101 1.378	2009 0.784	n.c. n.c. n.c. <i>rho Spearman</i> -0.204 n.c.
GSA18 GSA19 <b>T. marmorata</b> GSA9 GSA10 GSA11	0.327 0.324 0.202	0.245	0.183 0.284 0.151	1997 0.520 0.166 0.108	1998	0.839	0.015 2000 0.208 0.553 0.010	0.161	2002 0.221 0.216	0.142	0.258	0.056 2005 0.039 0.239	0.804	0.342	0.101 1.378 0.174	2009 0.784 0.317	n.c. n.c. n.c. <i>rho Spearman</i> -0.204
GSA18 GSA19 <b>T. marmorata</b> GSA9 GSA10	0.327 0.324		0.183 0.284	<b>1997</b> 0.520 0.166	<b>1998</b> 0.523		0.015 2000 0.208 0.553		<b>2002</b> 0.221			0.056 2005 0.039		0.342	0.101 1.378	2009 0.784	n.c. n.c. n.c. <i>n</i> ho Spearman -0.204 n.c. n.c.
GSA18 GSA19 <b>T. marmorata</b> GSA9 GSA10 GSA11 GSA16 GSA17 GSA18	0.327 0.324 0.202 1.726 0.233	0.245 2.174 0.018 0.179	0.183 0.284 0.151	1997 0.520 0.166 0.108	1998 0.523 0.025 0.093	0.839 2.302 0.007 0.329	0.015 2000 0.208 0.553 0.010 0.976 0.008	0.161 1.169 0.035 0.531	2002 0.221 0.216	0.142 1.791 0.033 0.161	0.258 0.287 0.023 0.220	0.056 2005 0.039 0.239	0.804	0.342 0.060 1.670 0.078	0.101 1.378 0.174	2009 0.784 0.317 2.657 0.041 0.292	n.c. n.c. n.c. <i>rho Spearman</i> -0.204 n.c. n.c. -0.050 n.c. -0.064
GSA18 GSA19 <b>T. marmorata</b> GSA9 GSA10 GSA16 GSA16 GSA17 GSA18 GSA19	0.327 0.324 0.202 1.726 0.233 0.539	0.245 2.174 0.018 0.179 0.257	0.183 0.284 0.151 1.623 0.082 0.036	1997 0.520 0.166 0.108 1.468 0.042	1998 0.523 0.025 0.093 0.511	0.839 2.302 0.007 0.329 0.038	0.015 2000 0.208 0.553 0.010 0.976 0.008 6.062	0.161 1.169 0.035 0.531 0.179	2002 0.221 0.216 1.042 0.040 0.442 0.867	0.142 1.791 0.033 0.161 0.154	0.258 0.287 0.023 0.220 0.220	0.056 2005 0.039 0.239 0.522 0.040 0.661	0.804 0.301 0.074 0.176 0.467	0.342 0.060 1.670 0.078 0.142	0.101 1.378 0.174 1.712 0.107 0.385	2009 0.784 0.317 2.657 0.041 0.292 0.101	n.c. n.c. n.c. <i>rho Spearman</i> -0.204 n.c. n.c. -0.050 n.c. -0.064 -0.107
GSA18 GSA19 T. marmorata GSA9 GSA10 GSA10 GSA16 GSA17 GSA18 GSA19 T. torpedo	0.327 0.324 0.202 1.726 0.233	0.245 2.174 0.018 0.179	0.183 0.284 0.151 1.623 0.082 0.036 <b>1996</b>	1997 0.520 0.166 0.108 1.468 0.042 1997	1998 0.523 0.025 0.093 0.511 1998	0.839 2.302 0.007 0.329	0.015 2000 0.208 0.553 0.010 0.976 0.008 6.062 2000	0.161 1.169 0.035 0.531	2002 0.221 0.216 1.042 0.040 0.442 0.867 2002	0.142 1.791 0.033 0.161 0.154 2003	0.258 0.287 0.023 0.220 0.220 2004	0.056 2005 0.039 0.239 0.522 0.040 0.661 2005	0.804 0.301 0.074 0.176	0.342 0.060 1.670 0.078 0.142 2007	0.101 1.378 0.174 1.712 0.107 0.385 2008	2009 0.784 0.317 2.657 0.041 0.292	n.c. n.c. n.c. n.c. <i>rho Spearman</i> -0.204 n.c. n.c. -0.050 n.c. -0.064 -0.107 <i>rho Spearman</i>
GSA18 GSA19 T. marmorata GSA9 GSA10 GSA11 GSA16 GSA17 GSA18 GSA19 T. torpedo GSA9	0.327 0.324 0.202 1.726 0.233 0.539	0.245 2.174 0.018 0.179 0.257 <b>1995</b>	0.183 0.284 0.151 1.623 0.082 0.036	1997 0.520 0.166 0.108 1.468 0.042	1998 0.523 0.025 0.093 0.511	0.839 2.302 0.007 0.329 0.038 <b>1999</b>	0.015 2000 0.208 0.553 0.010 0.976 0.008 6.062 2000 0.029	0.161 1.169 0.035 0.531 0.179	2002 0.221 0.216 1.042 0.040 0.442 0.867	0.142 1.791 0.033 0.161 0.154	0.258 0.287 0.023 0.220 0.220	0.056 2005 0.039 0.239 0.522 0.040 0.661	0.804 0.301 0.074 0.176 0.467	0.342 0.060 1.670 0.078 0.142	0.101 1.378 0.174 1.712 0.107 0.385	2009 0.784 0.317 2.657 0.041 0.292 0.101	n.c. n.c. n.c. n.c. <i>rho Spearman</i> -0.204 n.c. -0.050 n.c. -0.064 -0.107 <i>rho Spearman</i> n.c.
GSA18 GSA19 <b>T. marmorata</b> GSA10 GSA11 GSA16 GSA17 GSA18 GSA19 <b>T. torpedo</b> GSA9 GSA9 GSA9	0.327 0.324 0.202 1.726 0.233 0.539 <b>1994</b>	0.245 2.174 0.018 0.179 0.257 <b>1995</b> 0.112	0.183 0.284 0.151 1.623 0.082 0.036 <b>1996</b> 0.272	1997 0.520 0.166 0.108 1.468 0.042 1997	1998 0.523 0.025 0.093 0.511 1998	0.839 2.302 0.007 0.329 0.038	0.015 2000 0.208 0.553 0.010 0.976 0.008 6.062 2000	0.161 1.169 0.035 0.531 0.179 <b>2001</b>	2002 0.221 0.216 1.042 0.040 0.442 0.867 2002 0.040	0.142 1.791 0.033 0.161 0.154 2003	0.258 0.287 0.023 0.220 0.220 2004 0.340	0.056 2005 0.039 0.239 0.522 0.040 0.661 2005 0.031	0.804 0.301 0.074 0.176 0.467 <b>2006</b>	0.342 0.060 1.670 0.078 0.142 2007 0.059	0.101 1.378 0.174 1.712 0.107 0.385 <b>2008</b> 0.278	2009 0.784 0.317 2.657 0.041 0.292 0.101 2009	n.c. n.c. n.c. n.c. <i>rho Spearman</i> -0.204 n.c. n.c. -0.050 n.c. -0.064 -0.107 <i>rho Spearman</i> n.c. n.c.
GSA18 GSA19 T. marmorata GSA9 GSA10 GSA16 GSA16 GSA17 GSA18 GSA19 T. torpedo GSA9 GSA10 GSA10 GSA11	0.327 0.324 0.202 1.726 0.233 0.539	0.245 2.174 0.018 0.179 0.257 <b>1995</b>	0.183 0.284 0.151 1.623 0.082 0.036 <b>1996</b>	1997 0.520 0.166 0.108 1.468 0.042 1997	1998 0.523 0.025 0.093 0.511 1998	0.839 2.302 0.007 0.329 0.038 <b>1999</b>	0.015 2000 0.208 0.553 0.010 0.976 0.008 6.062 2000 0.029	0.161 1.169 0.035 0.531 0.179	2002 0.221 0.216 1.042 0.040 0.442 0.867 2002	0.142 1.791 0.033 0.161 0.154 <b>2003</b> 1.505	0.258 0.287 0.023 0.220 0.220 2004	0.056 2005 0.039 0.239 0.522 0.040 0.661 2005 0.031 0.251	0.804 0.301 0.074 0.176 0.467	0.342 0.060 1.670 0.078 0.142 2007 0.059 3.053	0.101 1.378 0.174 1.712 0.107 0.385 <b>2008</b> 0.278 0.421	2009 0.784 0.317 2.657 0.041 0.292 0.101	n.c. n.c. n.c. rho Spearman -0.204 n.c. -0.050 n.c. -0.050 n.c. -0.064 -0.107 rho Spearman n.c. n.c. n.c.
GSA18 GSA19 <b>T. marmorata</b> GSA10 GSA11 GSA16 GSA17 GSA18 GSA19 <b>T. torpedo</b> GSA9 GSA9 GSA9	0.327 0.324 0.202 1.726 0.233 0.539 <b>1994</b>	0.245 2.174 0.018 0.179 0.257 <b>1995</b> 0.112	0.183 0.284 0.151 1.623 0.082 0.036 <b>1996</b> 0.272	1997 0.520 0.166 0.108 1.468 0.042 1997	1998 0.523 0.025 0.093 0.511 1998	0.839 2.302 0.007 0.329 0.038 <b>1999</b>	0.015 2000 0.208 0.553 0.010 0.976 0.008 6.062 2000 0.029	0.161 1.169 0.035 0.531 0.179 <b>2001</b>	2002 0.221 0.216 1.042 0.040 0.442 0.867 2002 0.040	0.142 1.791 0.033 0.161 0.154 2003	0.258 0.287 0.023 0.220 0.220 2004 0.340	0.056 2005 0.039 0.239 0.522 0.040 0.661 2005 0.031	0.804 0.301 0.074 0.176 0.467 <b>2006</b>	0.342 0.060 1.670 0.078 0.142 2007 0.059	0.101 1.378 0.174 1.712 0.107 0.385 <b>2008</b> 0.278	2009 0.784 0.317 2.657 0.041 0.292 0.101 2009	n.c. n.c. n.c. n.c. <i>rho Spearman</i> -0.204 n.c. n.c. -0.050 n.c. -0.064 -0.107 <i>rho Spearman</i> n.c. n.c.
GSA18 GSA19 T. marmorata GSA9 GSA10 GSA16 GSA16 GSA16 GSA17 T. torpedo GSA9 GSA10 GSA10 GSA11 GSA16	0.327 0.324 0.202 1.726 0.233 0.539 <b>1994</b> 0.014	0.245 2.174 0.018 0.179 0.257 <b>1995</b> 0.112 0.570	0.183 0.284 0.151 1.623 0.082 0.036 <b>1996</b> 0.272 0.638	1997 0.520 0.166 0.108 1.468 0.042 1997 0.042	1998 0.523 0.025 0.093 0.511 1998 0.139 3.467	0.839 2.302 0.007 0.329 0.038 <b>1999</b> 0.672 0.672	0.015 2000 0.208 0.553 0.010 0.976 0.008 6.062 2000 0.029 0.047 0.029 0.047	0.161 1.169 0.035 0.531 0.179 <b>2001</b>	2002 0.221 0.216 1.042 0.040 0.442 0.867 2002 0.040	0.142 1.791 0.033 0.161 0.154 <b>2003</b> 1.505 0.520	0.258 0.287 0.023 0.220 0.220 2004 0.340 0.023 0.569	0.056 2005 0.039 0.239 0.522 0.040 0.661 2005 0.031 0.251 0.136 0.120	0.804 0.301 0.074 0.176 0.467 <b>2006</b> 0.048 0.048	0.342 0.060 1.670 0.078 0.142 2007 0.059 3.053 0.112 4.993	0.101 1.378 0.174 1.712 0.107 0.385 <b>2008</b> 0.278 0.421 0.261	2009 0.784 0.317 2.657 0.041 0.292 0.101 2009 0.251 0.275	n.c. n.c. n.c. n.c. <i>rho Spearman</i> -0.204 n.c. -0.050 n.c. -0.064 -0.107 <i>rho Spearman</i> n.c. n.c. n.c. n.c. n.c. n.c.
GSA18 GSA19 T. marmorata GSA9 GSA10 GSA11 GSA16 GSA16 GSA17 GSA18 GSA19 T. torpedo GSA9 GSA10 GSA11 GSA16 GSA17 GSA17 GSA19 T. nobiliana	0.327 0.324 0.202 1.726 0.233 0.539 <b>1994</b>	0.245 2.174 0.018 0.179 0.257 <b>1995</b> 0.112	0.183 0.284 0.151 1.623 0.082 0.036 <b>1996</b> 0.272	1997 0.520 0.166 0.108 1.468 0.042 1997	1998 0.523 0.025 0.093 0.511 1998 0.139	0.839 2.302 0.007 0.329 0.038 <b>1999</b> 0.672 0.672 0.206 <b>1999</b>	0.015 2000 0.208 0.553 0.010 0.976 0.0976 0.008 6.062 2000 0.029 0.047 0.029 0.047 0.051 2000	0.161 1.169 0.035 0.531 0.179 <b>2001</b> 0.321	2002 0.221 0.216 1.042 0.040 0.442 0.867 2002 0.040 0.026 2002	0.142 1.791 0.033 0.161 0.154 <b>2003</b> 1.505 0.520 0.007	0.258 0.287 0.023 0.220 0.220 2004 0.340 0.023	0.056 2005 0.039 0.239 0.522 0.040 0.661 2005 0.031 0.251 0.136	0.804 0.301 0.074 0.176 0.467 <b>2006</b> 0.048	0.342 0.060 1.670 0.078 0.142 2007 0.059 3.053 0.112	0.101 1.378 0.174 1.712 0.107 0.385 <b>2008</b> 0.278 0.421 0.261	2009 0.784 0.317 2.657 0.041 0.292 0.101 2009 0.251	n.c. n.c. n.c. <i>rho Spearman</i> -0.204 n.c. -0.050 n.c. -0.064 -0.107 <i>rho Spearman</i> n.c. n.c. n.c. n.c. n.c. n.c. n.c. <i>n.c.</i>
GSA18 GSA19 T. marmorata GSA19 GSA10 GSA11 GSA16 GSA17 GSA18 GSA19 T. torpedo GSA9 GSA10 GSA10 GSA11 GSA16 GSA17 GSA19 T. nobiliana GSA9	0.327 0.324 0.202 1.726 0.233 0.539 <b>1994</b> 0.014	0.245 2.174 0.018 0.179 0.257 1995 0.112 0.570 1995	0.183 0.284 0.151 1.623 0.082 0.036 <b>1996</b> 0.272 0.638 <b>1996</b>	1997 0.520 0.166 0.108 1.468 0.042 1997 0.042	1998 0.523 0.025 0.093 0.511 1998 0.139 3.467 1998	0.839 2.302 0.007 0.329 0.038 <b>1999</b> 0.672 0.672 0.206 <b>1999</b> 0.082	0.015 2000 0.208 0.553 0.010 0.976 0.0976 0.0976 0.0976 0.008 6.062 2000 0.029 0.047 0.051 2000 0.051 2000 0.038	0.161 1.169 0.035 0.531 0.179 <b>2001</b> 0.321 0.931 <b>2001</b>	2002 0.221 0.216 1.042 0.040 0.442 0.867 2002 0.040 0.026	0.142 1.791 0.033 0.161 0.154 <b>2003</b> 1.505 0.520 0.007 0.903 <b>2003</b>	0.258 0.287 0.023 0.220 0.220 2004 0.340 0.023 0.569	0.056 2005 0.039 0.239 0.522 0.040 0.661 2005 0.031 0.251 0.120 2005	0.804 0.301 0.074 0.176 0.467 <b>2006</b> 0.048 0.048 0.703 <b>2006</b>	0.342 0.060 1.670 0.078 0.142 2007 0.059 3.053 0.112 4.993 2007	0.101 1.378 0.174 1.712 0.107 0.385 <b>2008</b> 0.278 0.421 0.261	2009 0.784 0.317 2.657 0.041 0.292 0.101 2009 0.251 0.275	n.c. n.c. n.c. rho Spearman -0.204 n.c. n.c. -0.050 n.c. -0.064 -0.107 rho Spearman n.c. n.c. n.c. n.c. n.c. n.c. n.c. n.
GSA18 GSA19 <b>T. marmorata</b> GSA10 GSA11 GSA16 GSA17 GSA18 GSA19 <b>T. torpedo</b> GSA19 GSA10 GSA10 GSA10 GSA17 GSA16 GSA17 GSA17 GSA19 <b>T. nobiliana</b> GSA9 GSA11	0.327 0.324 0.202 1.726 0.233 0.539 <b>1994</b> 0.014 <b>1994</b>	0.245 2.174 0.018 0.179 0.257 <b>1995</b> 0.112 0.570	0.183 0.284 0.151 1.623 0.082 0.036 <b>1996</b> 0.272 0.638	1997 0.520 0.166 0.108 1.468 0.042 1997 0.042 1997 1.086	1998 0.523 0.025 0.093 0.511 1998 0.139 3.467	0.839 2.302 0.007 0.329 0.038 <b>1999</b> 0.672 0.672 0.206 <b>1999</b>	0.015 2000 0.208 0.553 0.010 0.976 0.0976 0.008 6.062 2000 0.029 0.047 0.029 0.047 0.051 2000	0.161 1.169 0.035 0.531 0.179 <b>2001</b> 0.321 0.321	2002 0.221 0.216 1.042 0.040 0.442 0.867 2002 0.040 0.026 2002 0.066	0.142 1.791 0.033 0.161 0.154 <b>2003</b> 1.505 0.520 0.007 0.903	0.258 0.287 0.023 0.220 0.220 2004 0.340 0.023 0.569	0.056 2005 0.039 0.239 0.522 0.040 0.661 2005 0.031 0.251 0.136 0.120	0.804 0.301 0.074 0.176 0.467 <b>2006</b> 0.048 0.048	0.342 0.060 1.670 0.078 0.142 2007 0.059 3.053 0.112 4.993	0.101 1.378 0.174 1.712 0.107 0.385 <b>2008</b> 0.278 0.421 0.421 1.126 <b>2008</b>	2009 0.784 0.317 2.657 0.041 0.292 0.101 2009 0.251 0.275	n.c. n.c. n.c. rho Spearman -0.204 n.c. n.c. -0.050 n.c. -0.050 n.c. -0.050 n.c. -0.064 -0.107 rho Spearman n.c. n.c. n.c. n.c. n.c. n.c. n.c. n.
GSA18 GSA19 T. marmorata GSA19 GSA16 GSA17 GSA18 GSA18 GSA19 T. torpedo GSA9 GSA10 GSA10 GSA11 GSA16 GSA17 GSA17 GSA19 T. nobiliana GSA9	0.327 0.324 0.202 1.726 0.233 0.539 <b>1994</b> 0.014	0.245 2.174 0.018 0.179 0.257 1995 0.112 0.570 1995	0.183 0.284 0.151 1.623 0.082 0.036 <b>1996</b> 0.272 0.638 <b>1996</b>	1997 0.520 0.166 0.108 1.468 0.042 1997 0.042	1998 0.523 0.025 0.093 0.511 1998 0.139 3.467 1998	0.839 2.302 0.007 0.329 0.038 <b>1999</b> 0.672 0.672 0.206 <b>1999</b> 0.082	0.015 2000 0.208 0.553 0.010 0.976 0.0976 0.0976 0.0976 0.008 6.062 2000 0.029 0.047 0.051 2000 0.051 2000 0.038	0.161 1.169 0.035 0.531 0.179 <b>2001</b> 0.321 0.931 <b>2001</b>	2002 0.221 0.216 1.042 0.040 0.442 0.867 2002 0.040 0.026 2002	0.142 1.791 0.033 0.161 0.154 <b>2003</b> 1.505 0.520 0.007 0.903 <b>2003</b>	0.258 0.287 0.023 0.220 0.220 2004 0.340 0.023 0.569	0.056 2005 0.039 0.239 0.522 0.040 0.661 2005 0.031 0.251 0.120 2005	0.804 0.301 0.074 0.176 0.467 <b>2006</b> 0.048 0.048 0.703 <b>2006</b>	0.342 0.060 1.670 0.078 0.142 2007 0.059 3.053 0.112 4.993 2007	0.101 1.378 0.174 1.712 0.107 0.385 <b>2008</b> 0.278 0.421 0.261	2009 0.784 0.317 2.657 0.041 0.292 0.101 2009 0.251 0.275	n.c. n.c. n.c. rho Spearman -0.204 n.c. n.c. -0.050 n.c. -0.064 -0.107 rho Spearman n.c. n.c. n.c. n.c. n.c. n.c. n.c. n.

## Tab. 7 - Density index (n/km<sup>2</sup>) for slope stratum (200-800 m depth) per GSA. Medits 1994-2009. Significant Spearman rho values are in bold.

Indici di densità (n/km<sup>2</sup>) per la scarpata (200-800 m) e per GSA. Medits 1994-2009. In grassetto i valori del rho di Spearman significativi. In grassetto i valori del rho di Spearman significativi.

C. granulosus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9	1.182		1.542	1.486	0.897	0.548	0.152	0.452		0.368			0.699	0.477			n.c.
GSA10	0.531	0.227		0.232	0.693	1.632		0.453		0.240	0.523		0.264	0.264	0.257		n.c.
GSA11			1.344			0.575	0.139	0.402			1.569	0.274					n.c.
GSA16	4.217	0.421	0.859		3.795	2.076	4.501	1.655	6.717	1.338	1.094	8.060	8.128	3.503	6.232	6.733	0.536
GSA18						0.593			0.834					0.819			n.c.
C. uyato	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA10							0.214										n.c.
GSA16		0.421											1.912				n.c.
GSA19							0.199										n.c.
C. monstrosa	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9	4.533	4.230	7.204	5.718	7.753	6.545	4.241	5.275	4.010	4.023	5.098	5.858	2.980	5.833	6.266	5.335	-0.056
GSA10	0.266	2.270	1.602	3.019	1.778	2.798	2.574	2.715	0.788	0.240	1.046	1.288	1.056	0.264	1.406	1.637	-0.350
GSA11			2.091	0.949	0.747	1.294	2.925	1.071	0.479	0.435	1.345	0.549	0.450	1.242	1.595	2.188	0.007
GSA16	17.394	8.414	7.300	6.188	12.648	15.360	21.277	8.687	9.404	15.258	17.785	8.746	12.431	13.555	17.137	14.249	0.268
GSA17	14.322	10.010	42.034	10.945				13.157		6.229	3.344			10.005	2.041	08.444	n.c.
GSA18 GSA19	1.704	12.348	35.446	54.466 2.630	32.135	85.412	29.241 5.169	75.012	76.823	31.855	17.536	55.186	39.871	49.275 3.171	25.784	87.116 1.484	-0.154 0.424
	1.794 1994	2.910 1995	2.291 1996	2.630 1997	2.368 1998	2.064 1999	2000	4.084	3.719 2002	6.050 2003	3.100 2004	4.038	4.644	2007	6.877 2008	2009	
D. licha GSA9	1.994			0.892	0.449		1.219	0.301		0.736	0.146	2005					rho Spearman
GSA9 GSA10	2.015	0.619	0.617	0.892	0.449	0.548 0.933	0.429	0.301	0.349 0.525	0.736	0.146	0.266	0.699 0.528	0.863	1.044	0.431 2.456	-0.193 0.125
GSA10 GSA11	2.013	0.172	0.229	0.929	0.462	0.933	0.429	0.905	0.525	0.479	0.937	0.200	0.526	0.529		0.729	0.125 n.c.
GSA16	0.527	0.172	0.429	0.138	0.149	0.719	1.227	1.655	1.612	2.409	1.915	1.715	0.956	2.132	1.714	2.192	0.745
GSA10 GSA17	0.527	1.503	0.429	5.970		-	1.447	1.055	1.012	2.409	1.913	1.715	0.950	2.152	1.714	2.172	n.c.
GSA18		0.771		1.649	1.276			2.861		2.631	1.684	2,590	0.868			0.763	n.c.
GSA19		0.909	0.382	1.618	0.911	0.938	0.596	1.377	0.930	1.895	2.215	2.763	1.689	0.634	1.688	0.848	0.325
D. pastinaca	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSAII						12.282											n.c.
GSA16											<u> </u>		0.159				n.c.
D. batis	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9			0.154														n.c.
D. oxyrhincus	1004				1000	1000	0000	0004									
D. Oxyrnineus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9	0.849	1995 1.401	1996 1.631	0.394	0.951	2.165	2000	3.698	2002	2003 1.834	2004 1.819	2005 1.139	2006 0.488	2007	2008 0.162	2009 1.571	rho Spearman 0.026
GSA9	0.849	1.401	1.631	0.394	0.951	2.165	1.978	3.698	2.501	1.834	1.819	1.139	0.488	2.100	0.162	1.571	0.026
GSA9 GSA10 GSA11 GSA16	0.849 0.421	1.401 0.770	1.631 0.770	0.394 0.570	0.951 0.979	2.165 1.587	1.978 0.917 15.875 8.592	3.698 0.173 23.670 5.791	2.501 0.441	1.834 0.835 24.589 4.283	1.819 0.217 12.008 3.831	1.139 0.452 31.881 3.773	0.488 0.224	2.100 1.986 15.153 3.655	0.162 0.846	1.571 0.706 17.461 3.601	0.026
GSA9 GSA10 GSA11 GSA16 GSA19	0.849 0.421 12.412 0.527	1.401 0.770 17.777 1.683	1.631 0.770 23.211 1.288	0.394 0.570 1.791 4.125	0.951 0.979 38.315 3.373	2.165 1.587 18.851 1.245 0.188	1.978 0.917 15.875 8.592 0.199	3.698 0.173 23.670 5.791 0.208	2.501 0.441 25.780 5.642	1.834 0.835 24.589 4.283 0.237	1.819 0.217 12.008 3.831 0.221	1.139 0.452 31.881 3.773 0.213	0.488 0.224 10.619 8.925 0.633	2.100 1.986 15.153 3.655 0.211	0.162 0.846 21.186 5.297 0.211	1.571 0.706 17.461 3.601 0.212	0.026 0.006 0.000 0.471 n.c.
GSA9 GSA10 GSA11 GSA16 GSA16 GSA19 E.spinax	0.849 0.421 12.412 0.527 <b>1994</b>	1.401 0.770 17.777 1.683 1995	1.631 0.770 23.211 1.288 1996	0.394 0.570 1.791 4.125 1997	0.951 0.979 38.315 3.373 <b>1998</b>	2.165 1.587 18.851 1.245 0.188 1999	1.978 0.917 15.875 8.592 0.199 <b>2000</b>	3.698 0.173 23.670 5.791 0.208 2001	2.501 0.441 25.780 5.642 2002	1.834 0.835 24.589 4.283 0.237 2003	1.819 0.217 12.008 3.831 0.221 2004	1.139 0.452 31.881 3.773 0.213 2005	0.488 0.224 10.619 8.925 0.633 <b>2006</b>	2.100 1.986 15.153 3.655 0.211 2007	0.162 0.846 21.186 5.297 0.211 2008	1.571 0.706 17.461 3.601 0.212 2009	0.026 0.006 0.000 0.471 n.c. <b>rho Spearman</b>
GSA9 GSA10 GSA11 GSA16 GSA19 E.spinax GSA9	0.849 0.421 12.412 0.527 <b>1994</b> 57.468	1.401 0.770 17.777 1.683 <b>1995</b> 83.124	1.631 0.770 23.211 1.288 <b>1996</b> 40.652	0.394 0.570 1.791 4.125 <b>1997</b> 36.775	0.951 0.979 38.315 3.373 <b>1998</b> 51.656	2.165 1.587 18.851 1.245 0.188 1999 70.323	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542	2.501 0.441 25.780 5.642 <b>2002</b> 33.728	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652	1.819           0.217           12.008           3.831           0.221           2004           64.260	1.139 0.452 31.881 3.773 0.213 <b>2005</b> 56.477	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793	2.100 1.986 15.153 3.655 0.211 <b>2007</b> 58.633	0.162 0.846 21.186 5.297 0.211 <b>2008</b> 76.401	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264	0.026 0.006 0.000 0.471 n.c. <i>rho Spearman</i> 0.197
GSA9 GSA10 GSA11 GSA16 GSA19 <b>E.spinax</b> GSA9 GSA10	0.849 0.421 12.412 0.527 <b>1994</b>	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539	0.394 0.570 1.791 4.125 <b>1997</b> 36.775 96.612	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992	1.978 0.917 15.875 8.592 0.199 <b>2000</b>	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250	2.501 0.441 25.780 5.642 2002 33.728 19.475	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380	1.139 0.452 31.881 3.773 0.213 <b>2005</b> 56.477 44.675	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920	0.162 0.846 21.186 5.297 0.211 <b>2008</b> 76.401 58.131	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573	0.026 0.006 0.000 0.471 n.c. <i>rho Spearman</i> 0.197 -0.544
GSA9 GSA10 GSA11 GSA16 GSA19 <b>E.spinax</b> GSA9 GSA10 GSA11	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567	0.394 0.570 1.791 4.125 <b>1997</b> 36.775 96.612 61.567	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841	2.165 1.587 18.851 1.245 0.188 <b>1999</b> 70.323 110.992 80.256	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.619	2.501 0.441 25.780 5.642 <b>2002</b> 33.728 19.475 11.620	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939 36.810	1.819 0.217 12.008 3.831 0.221 <b>2004</b> 64.260 34.380 67.142	1.139 0.452 31.881 3.773 0.213 <b>2005</b> 56.477 44.675 80.414	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506	0.162 0.846 21.186 5.297 0.211 <b>2008</b> 76.401 58.131 138.498	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573 112.214	0.026 0.006 0.000 0.471 n.c. <i>rho Spearman</i> 0.197 <b>-0.544</b> 0.521
GSA9           GSA10           GSA11           GSA16           GSA19           Espinax           GSA10           GSA11           GSA11           GSA11           GSA11	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 30.572	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567 103.915	0.394 0.570 1.791 4.125 <b>1997</b> 36.775 96.612	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 42.144	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.619 34.333	2.501 0.441 25.780 5.642 <b>2002</b> 33.728 19.475 11.620 51.855	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939 36.810 33.192	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958	1.139 0.452 31.881 3.773 0.213 <b>2005</b> 56.477 44.675	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920	0.162 0.846 21.186 5.297 0.211 2008 76.401 58.131 138.498 75.869	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573	0.026 0.000 0.471 n.c. <i>rho Spearman</i> 0.197 -0.544 0.521 0.359
GSA9           GSA10           GSA11           GSA16           GSA19           Expinax           GSA9           GSA10           GSA11           GSA10           GSA11           GSA11           GSA11           GSA16           GSA17	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561 13.878	1.631 0.770 23.211 1.288 40.652 51.539 40.567 103.915 15.486	0.394 0.570 1.791 4.125 <b>1997</b> 36.775 96.612 61.567 12.788	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168	2.165 1.587 18.851 1.245 0.188 <b>7999</b> 70.323 110.992 80.256 21.586	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 <b>42.144</b> 4.570	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.619 34.333 2.067	2.501 0.441 25.780 5.642 <b>2002</b> 33.728 19.475 11.620 51.855 2.065	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939 36.810 33.192 14.534	1.819           0.217           12.008           3.831           0.221           2004           64.260           34.380           67.142           42.958           40.133	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522	0.162 0.846 21.186 5.297 0.211 <b>2008</b> 76.401 58.131 138.498 75.869 1.020	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573 112.214 64.355	0.026 0.006 0.000 0.471 n.c. <b>rho Spearman</b> 0.197 <b>-0.544</b> 0.521 0.359 n.c.
GSA9           GSA10           GSA11           GSA16           GSA19 <b>Espinax</b> GSA10           GSA10           GSA10           GSA10           GSA10           GSA11           GSA10           GSA11           GSA16           GSA17           GSA18	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 30.572 14.053	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561 13.878 51.246	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567 103.915 15.486 54.864	0.394 0.570 1.791 4.125 <b>1997</b> 36.775 96.612 61.567 12.788 193.927	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760	2.165 1.587 18.851 1.245 0.188 <b>7999</b> 70.323 110.992 80.256 21.586 127.907	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 42.144 4.570 156.545	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.619 34.333 2.067 58.593	2.501 0.441 25.780 5.642 <b>2002</b> 33.728 19.475 11.620 51.855 2.065 <b>8</b> 8.908	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939 36.810 33.192 14.534 81.248	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971 126.931	2.100 1.986 15.153 3.655 0.211 <b>2007</b> 58.633 41.920 104.506 100.522	0.162 0.846 21.186 5.297 0.211 <b>2008</b> 76.401 58.131 138.498 75.869 1.020 73.631	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573 112.214 64.355	0.026 0.006 0.000 0.471 n.c. <i>rho Spearman</i> 0.197 0.5544 0.521 0.359 n.c. 0.111
GSA9           GSA10         GSA11           GSA11         GSA16           GSA19         Espinax           GSA10         GSA19           GSA10         GSA10           GSA11         GSA10           GSA11         GSA10           GSA11         GSA11           GSA11         GSA16           GSA11         GSA16           GSA16         GSA17           GSA18         GSA19	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 <b>3</b> 0.572 14.053 <b>5</b> .512	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561 13.878 51.246	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567 103.915 15.486 54.864 64.148	0.394 0.570 1.791 4.125 <b>1997</b> 36.775 96.612 61.567 12.788 193.927 53.340	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760 57.599	2.165 1.587 18.851 1.245 0.188 <b>7999</b> 70.323 110.992 80.256 21.586 127.907 61.936	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 42.144 4.570 156.545 81.612	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.619 34.333 2.067 58.593 65.322	2.501 0.441 25.780 5.642 <b>2002</b> 33.728 19.475 11.620 51.855 2.065 <b>88</b> .908 44.390	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939 36.810 33.192 14.534 81.248 200.724	1.819           0.217           12.008           3.831           0.221           2004           64.260           34.380           67.142           42.958           40.133           76.957           69.757	1.139 0.452 31.881 3.773 0.213 <b>2005</b> 56.477 44.675 80.414 40.985 <b>274.289</b> 96.494	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971 126.931 39.457	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909	0.162 0.846 21.186 5.297 0.211 <b>2008</b> 76.401 58.131 138.498 75.869 1.020 73.631 58.521	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573 112.214 64.355 1777.480 51.647	0.026 0.000 0.000 0.471 n.c. <i>rho Spearman</i> 0.197 <b>-0.544</b> 0.359 n.c. 0.111 0.082
GS49 GSA10 GSA11 GSA16 GSA19 Espinax GSA9 GSA10 GSA16 GSA16 GSA17 GSA18 GSA19 GSA19 GSA19 GSA19	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 30.572 14.053	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561 13.878 51.246 45.461 <b>1995</b>	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567 103.915 15.486 54.864	0.394 0.570 1.791 4.125 <b>1997</b> 36.775 96.612 61.567 12.788 193.927	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760	2.165 1.587 18.851 1.245 0.188 <b>7999</b> 70.323 110.992 80.256 21.586 127.907	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 42.144 4.570 156.545	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.613 34.333 2.067 58.593 65.322 <b>2001</b>	2.501 0.441 25.780 5.642 <b>2002</b> 33.728 19.475 11.620 51.855 2.065 <b>8</b> 8.908	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939 36.810 33.192 14.534 81.248	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971 126.931	2.100 1.986 15.153 3.655 0.211 <b>2007</b> 58.633 41.920 104.506 100.522	0.162 0.846 21.186 5.297 0.211 <b>2008</b> 76.401 58.131 138.498 75.869 1.020 73.631	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573 112.214 64.355	0.026 0.006 0.000 0.471 n.c. <i>rho Spearman</i> 0.197 -0.544 0.521 0.359 n.c. 0.111 0.082 <i>rho Spearman</i>
CSA9 CSA10 CSA10 CSA11 CSA16 CSA19 CSA19 CSA19 CSA10 CSA11 CSA16 CSA16 CSA17 CSA18 CSA18 CSA19 CSA18 CSA19 CSA17 CSA18 CSA19 CSA10 C	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 30.572 14.053 5.512 <b>1994</b>	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561 13.878 51.246 45.461 <b>1995</b> 0.681	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567 103.915 15.486 54.864 64.148 <b>1996</b>	0.394 0.570 1.791 4.125 <b>1997</b> 36.775 96.612 61.567 12.788 193.927 53.340 <b>1997</b>	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760 57.599 <b>1998</b>	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 42.144 4.570 156.545 81.612 <b>2000</b>	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.619 34.333 2.067 58.593 65.322 <b>2001</b> 0.173	2.501 0.441 25.780 5.642 <u>2002</u> 33.728 19.475 11.620 51.855 2.065 88.908 44.390 2002	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939 36.810 33.192 14.534 81.248 200.724 <b>2003</b>	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 2004	1.139 0.452 31.881 3.773 0.213 <b>2005</b> 56.477 44.675 80.414 40.985 274.289 96.494 <b>2005</b>	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971 126.931 39.457 <b>2006</b>	2.100 1.986 15.153 3.655 0.211 <b>2007</b> 58.633 41.920 104.506 100.522 39.486 42.909 <b>2007</b>	0.162 0.846 21.186 5.297 0.211 <b>2008</b> 76.401 58.131 138.498 75.869 1.020 73.631 58.521 <b>2008</b>	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573 112.214 64.355 177.480 51.647 <b>2009</b>	0.026 0.006 0.000 0.471 n.c. <i>rho Spearman</i> 0.197 -0.544 0.521 0.359 n.c. 0.111 0.082 <i>rho Spearman</i> n.c.
GS.49 GS.410 GS.411 GS.416 GS.419 E.spinax GS.419 GS.410 GS.411 GS.416 GS.417 GS.418 GS.419 G.S.419 G.S.410 G.	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 30.572 14.053 5.512 <b>1994</b>	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561 13.878 51.246 45.461 <b>1995</b>	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567 103.915 15.486 54.864 64.148 <b>1996</b>	0.394 0.570 1.791 4.125 <b>1997</b> 36.775 96.612 61.567 12.788 <b>193.927</b> 53.340 <b>1997</b> <b>1997</b>	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760 57.599 <b>1998</b>	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 1999	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 42.144 4.570 156.545 81.612 <b>2000</b> <b>2000</b>	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.619 34.333 2.067 58.593 65.522 <b>2001</b> 0.173 <b>2001</b>	2.501 0.441 25.780 5.642 <u>2002</u> 33.728 19.475 11.620 51.855 2.065 88.908 44.390 2002 2002	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939 36.810 33.192 14.534 81.248 200.724 <b>2003</b>	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 69.757 2004 2004	1.139 0.452 31.881 3.773 0.213 <b>2005</b> 56.477 44.675 80.414 40.985 <b>274.289</b> 96.494 <b>2005</b> <b>2005</b>	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971 126.931 39.457 <b>2006</b>	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 2007	0.162 0.846 21.186 5.297 0.211 <b>2008</b> 76.401 58.131 138.498 75.869 1.020 73.631 58.521 <b>2008</b>	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573 112.214 64.355 1177.480 51.647 <b>2009</b> <b>2009</b>	0.026 0.006 0.000 0.471 n.c. <b>rho Spearman</b> 0.197 <b>-0.554</b> 0.521 0.359 n.c. 0.111 0.082 <b>rho Spearman</b> n.c. <b>rho Spearman</b>
GSA9 GSA10 GSA10 GSA11 GSA16 GSA19 GSA19 GSA19 GSA10 GSA11 GSA16 GSA17 GSA18 GSA19 GSA19 GSA19 GSA19 GSA10 GSA19 GSA10 GSA19 GSA10 G	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 95.704 95.704 <b>3</b> 0.572 14.053 <b>5</b> .512 <b>1994</b> <b>1994</b> 229.516	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561 13.878 51.246 45.461 <b>1995</b> 0.681 <b>1995</b> 268.521	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567 103.915 15.486 54.864 64.148 <b>1996</b> <b>1996</b> <b>253.986</b>	0.394 0.570 1.791 4.125 96.612 61.567 12.788 193.927 53.340 1997 1997 356.137	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760 57.599 <b>1998</b> <b>1998</b> 316.481	2.165 1.587 18.851 1.245 0.188 1999 70.323 80.256 21.586 127.907 61.936 1999 1999 298.430	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 42.144 4.570 156.545 81.612 <b>2000</b> 290.815	3.698 0.173 23.670 5.791 0.208 2001 51.542 39.250 50.619 34.333 2.067 58.593 65.322 2001 0.173 2001 415.245	2.501 0.441 25.780 5.642 <b>2002</b> 33.728 19.475 11.620 51.855 2.065 <b>88</b> .908 44.390 <b>2002</b> <b>2002</b> 412.700	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939 36.810 33.192 14.534 81.248 200.724 <b>2003</b> <b>2003</b>	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 69.757 2004 2004 258.993	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289 96.494 2005 245.122	0.488 0.224 10.619 8.925 0.633 2006 50.793 44.434 49.346 47.971 126.931 39.457 2006 2006 224.098	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 827.945	0.162 0.846 21.186 5.297 0.211 2008 76.401 138.498 75.869 1.020 73.631 58.521 2008 2008 356.717	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573 112.214 64.355 1177.480 51.647 <b>2009</b> 350.291	0.026 0.006 0.000 0.471 n.c. <b>rho Spearman</b> 0.197 <b>-0.544</b> 0.521 0.359 n.c. 0.111 0.111 0.082 <b>rho Spearman</b> n.c. <b>rho Spearman</b> 0.282
GS.49 GS.410 GS.411 GS.416 GS.419 E.spinax GS.419 GS.410 GS.411 GS.416 GS.417 GS.418 GS.419 G.S.419 G.S.410 G.	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 30.572 14.053 5.512 <b>1994</b>	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561 13.878 51.246 45.461 <b>1995</b>	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567 103.915 15.486 54.864 64.148 <b>1996</b>	0.394 0.570 1.791 4.125 <b>1997</b> 36.775 96.612 61.567 12.788 <b>193.927</b> 53.340 <b>1997</b> <b>1997</b>	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760 57.599 <b>1998</b>	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 1999	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 42.144 4.570 156.545 81.612 <b>2000</b> <b>2000</b>	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.619 34.333 2.067 58.593 65.522 <b>2001</b> 0.173 <b>2001</b>	2.501 0.441 25.780 5.642 <u>2002</u> 33.728 19.475 11.620 51.855 2.065 88.908 44.390 2002 2002	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939 36.810 33.192 14.534 81.248 200.724 <b>2003</b>	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 69.757 2004 2004	1.139 0.452 31.881 3.773 0.213 <b>2005</b> 56.477 44.675 80.414 40.985 <b>274.289</b> 96.494 <b>2005</b> <b>2005</b>	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971 126.931 39.457 <b>2006</b>	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 2007	0.162 0.846 21.186 5.297 0.211 <b>2008</b> 76.401 58.131 138.498 75.869 1.020 73.631 58.521 <b>2008</b>	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573 112.214 64.355 1177.480 51.647 <b>2009</b> <b>2009</b>	0.026 0.006 0.000 0.471 n.c. <b>rho Spearman</b> 0.197 <b>-0.554</b> 0.521 0.359 n.c. 0.111 0.082 <b>rho Spearman</b> n.c. <b>rho Spearman</b>
GS.49           GSA10           GSA11           GSA16           GSA17           Espinax           GSA19           GSA19           GSA11           GSA11           GSA16           GSA17           GSA18           GSA11           GSA11           GSA11           GSA11           GSA11           GSA10           GSA11           GSA11           GSA10           GSA10           GSA11	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 30.572 14.053 5.512 <b>1994</b> 229.516 127.180	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561 13.878 51.246 45.461 <b>1995</b> 0.681 <b>1995</b> 268.521 131.794 (685.851	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567 103.915 15.486 64.148 <b>1996</b> <b>253.986</b> 147.134 735.007	0.394 0.570 1.791 4.125 <b>1997</b> 36.775 96.612 61.567 12.788 <b>193.927</b> <b>53.340</b> <b>1997</b> <b>356.137</b> <b>350.731</b> 762.155	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760 57.599 <b>1998</b> <b>1998</b> <b>1998</b> 316.481 2694.070 698.225	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 298.430 263.116 999.987	1.978 0.917 15.875 8.592 0.199 2000 64.424 51.017 42.144 4.570 156.545 81.612 2000 2000 290.815 135.211 455.720	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.619 34.333 2.067 58.593 65.322 <b>2001</b> 0.173 <b>2001</b> 415.2401 415.243,797	2.501 0.441 25.780 5.642 33.728 19.475 11.620 51.855 2.065 88.908 44.390 2002 412.700 114.991 513.184	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939 36.810 33.192 14.534 81.248 200.724 <b>2003</b> <b>2003</b> 293.347 239.724 626.448	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 69.757 2004 2004 258.993 247.617 663.898	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289 96.494 2005 245.122 245.122 244.191 936.686	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971 126.931 39.457 <b>2006</b> 224.098 205.330 906.884	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 827.945 354.387 996.671	0.162 0.846 21.186 5.297 0.211 2008 76.401 58.131 138.498 75.869 1.020 73.631 58.521 2008 2008 356.717 253.216 713.924	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573 112.214 64.355 1177.480 51.647 <b>2009</b> 350.291 383.988 507.510	0.026 0.006 0.000 0.471 n.c. <i>rho Spearman</i> 0.197 -0.544 0.521 0.359 n.c. 0.359 n.c. <i>rho Spearman</i> 0.282 0.462 0.462 -0.043
GS.49 GS.410 GS.411 GS.411 GS.416 GS.419 GS.419 GS.419 GS.410 GS.416 GS.417 GS.418 GS.417 GS.418 GS.419 G.5.410 G.5.410 G.5.410 G.5.410 G.5.410	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 95.704 95.704 <b>3</b> 0.572 14.053 <b>5</b> .512 <b>1994</b> <b>1994</b> 229.516	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561 13.878 51.246 45.461 <b>1995</b> 268.521 131.794 685.851 81.616	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567 103.915 15.486 54.864 64.148 <b>1996</b> <b>1996</b> 253.986 147.134	0.394 0.570 1.791 4.125 <b>1997</b> 36.775 96.612 61.567 12.788 <b>193.927</b> <b>53.340</b> <b>1997</b> <b>356.137</b> <b>350.731</b>	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760 57.599 <b>1998</b> <b>1998</b> <b>316.481</b> 2694.070 698.225 69.567	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 1999 298.430 263.116	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 42.144 4.570 156.545 81.612 <b>2000</b> 290.815 135.211 455.720 164.893	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.619 34.333 2.067 58.593 65.322 <b>2001</b> 0.173 <b>2001</b> 415.245 200.381 1234.797	2.501 0.441 25.780 5.642 <b>2002</b> 33.728 19.475 11.620 51.855 2.065 <b>88</b> .908 44.390 <b>2002</b> <b>2002</b> 412.700 114.991 513.184 138.640	1.834 0.835 24.589 4.283 0.237 <b>2003</b> 48.652 23.939 36.810 33.192 14.534 81.248 200.724 <b>2003</b> <b>2003</b> 293.347 239.724	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.953 40.133 76.957 69.757 2004 2004 258.993 247.617	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289 96.494 2005 245.122 244.191 936.686 219.500	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971 126.931 39.457 <b>2006</b> 224.098 225.330 906.884	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 2007 827.945 354.387	0.162 0.846 21.186 5.297 0.211 2008 76.401 58.131 138.498 75.869 1.020 73.631 58.521 2008 2008 356.717 253.216 713.924 553.669	1.571 0.706 17.461 3.601 0.212 2009 76.264 49.573 112.214 64.355 177.480 51.647 2009 350.291 383.988	0.026 0.006 0.000 0.471 n.c. <b>rha Spearman</b> 0.197 <b>-0.544</b> 0.359 n.c. 0.111 0.082 <b>rha Spearman</b> 0.282 0.462
GS.49 GS.410 GS.411 GS.411 GS.416 GS.419 GS.419 GS.419 GS.419 GS.410 GS.417 GS.416 GS.417 GS.418 GS.418 GS.419 GS.410 GS.410 GS.410 GS.411 GS.	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 <b>30.572</b> 14.053 <b>5.512</b> <b>1994</b> <b>229.516</b> 127.180 <b>85.391</b>	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561 13.878 51.246 45.461 <b>1995</b> 0.681 <b>1995</b> 268.521 131.794 (685.851	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.565 15.486 54.864 64.148 <b>1996</b> <b>1996</b> 253.986 147.134 735.007	0.394 0.570 1.791 4.125 1997 36.775 96.612 61.567 12.788 193.927 53.340 1997 1997 356.137 356.137 356.731 762.155 34.650	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760 57.599 <b>1998</b> <b>1998</b> <b>1998</b> 316.481 2694.070 698.225	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 1999 298.430 263.116 999.987 96.723	1.978 0.917 15.875 8.592 0.199 2000 64.424 51.017 42.144 4.570 156.545 81.612 2000 2000 290.815 135.211 455.720	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.619 34.333 2.067 58.593 65.322 <b>2001</b> 0.173 <b>2001</b> 415.2401 415.243,797	2.501 0.441 25.780 5.642 33.728 19.475 11.620 51.855 2.065 88.908 44.390 2002 412.700 114.991 513.184	1.834 0.835 24.589 4.283 0.237 2003 48.652 23.939 36.810 33.192 14.534 81.248 200.724 2003 293.347 239.724 626.448 157.661	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 69.757 2004 2004 258.993 247.617 663.898 162.257	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289 96.494 2005 245.122 245.122 244.191 936.686	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971 126.931 39.457 <b>2006</b> 224.098 205.330 906.884	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 2007 827.945 354.387 996.671 423.714	0.162 0.846 21.186 5.297 0.211 2008 76.401 58.131 138.498 75.869 1.020 73.631 58.521 2008 2008 356.717 253.216 713.924	1.571 0.706 17.461 3.601 0.212 <b>2009</b> 76.264 49.573 112.214 64.355 1177.480 51.647 <b>2009</b> 350.291 383.988 507.510	0.026 0.006 0.000 0.471 n.c. <b>rho Spearman</b> 0.197 <b>-0.544</b> 0.359 n.c. 0.111 0.082 <b>rho Spearman</b> n.c. <b>rho Spearman</b> 0.282 0.462 -0.043 <b>0.897</b>
GS.49 GS.410 GS.411 GS.411 GS.416 GS.419 E.spinax GS.419 GS.411 GS.416 GS.417 GS.418 GS.419 G.S.410 G.S.410 G.S.410 GS.41	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 <b>30.572</b> 14.053 <b>5.512</b> <b>1994</b> <b>229.516</b> 127.180 <b>85.391</b>	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 84.561 13.878 51.246 45.461 <b>1995</b> 268.521 131.794 (85.851 81.616 13.528	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567 103.915 15.486 54.864 64.148 <b>1996</b> <b>15.486</b> 64.148 <b>1996</b> <b>1996</b> 253.986 147.134 735.007 112.503 112.503 112.541	0.394 0.570 1.791 4.125 1997 36.775 96.612 61.567 12.788 193.927 53.340 1997 1997 356.137 350.731 762.155 34.650 124.096 210.653 85.793	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760 57.599 <b>1998</b> 316.481 2694.070 698.225 69.567 17.521 170.752	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 298.430 263.116 999.987 96.723 17.706	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 42.144 4.570 156.545 81.612 <b>2000</b> 290.815 135.211 455.720 164.893 16.349	3.698 0.173 23.670 5.791 0.208 <b>2001</b> 51.542 39.250 50.619 34.333 2.067 58.593 65.322 <b>2001</b> 4.15.245 200.381 1234.797 100.930 32.613	2.501 0.441 25.780 5.642 <b>2002</b> 33.728 19.475 11.620 51.855 2.065 <b>88.908</b> 44.390 <b>2002</b> <b>2002</b> 412.700 114.991 513.184 138.640 4.180	1.834 0.835 24.589 4.283 0.237 2003 48.652 23.939 36.810 33.192 14.534 81.248 200.724 2003 293.347 239.724 626.448 157.661 8.276	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 69.757 2004 258.993 247.617 663.898 162.257 9.459	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289 96.494 2005 245.122 244.191 936.686 219.500 16.307	0.488 0.224 10.619 8.925 50.793 44.434 49.346 47.971 126.931 39.457 2006 224.098 265.330 906.884 254.519 3.525	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 2007 827.945 354.387 996.671 423.714 31.460	0.162 0.846 21.186 5.297 0.211 2008 76.401 58.131 138.498 75.869 1.020 73.631 58.521 2008 2008 356.717 253.216 713.924 553.669 7.143	1.571 0.706 17.461 3.601 0.212 2009 76.264 49.573 112.214 64.355 1172.480 51.647 2009 350.291 383.988 507.510 465.203	0.026 0.006 0.000 0.471 n.c. <b>rho Spearman</b> 0.197 <b>-0.544</b> 0.521 0.359 n.c. 0.111 0.082 <b>rho Spearman</b> 0.282 <b>rho Spearman</b> 0.282 0.462 -0.043 <b>0.897</b> <b>-0.600</b>
GSA9 GSA10 GSA10 GSA11 GSA16 GSA19 Espinac GSA19 GSA10 GSA16 GSA16 GSA16 GSA17 GSA18 GSA19 GSA10 GSA10 GSA10 GSA10 GSA10 GSA10 GSA10 GSA11 GSA11 GSA16 GSA17 GSA18	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 30.572 14.053 5.512 <b>1994</b> 229.516 127.180 85.391 59.996	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 <b>84.561</b> 13.878 51.246 <b>45.461</b> <b>13.5246</b> <b>45.461</b> <b>1995</b> 0.681 <b>1995</b> 268.521 131.794 685.851 <b>131.794</b>	1.631 0.770 23.211 1.288 <b>1996</b> 40.652 51.539 40.567 103.915 15.486 64.148 <b>1996</b> <b>1996</b> <b>253.986</b> 147.134 735.007 112.503 174.541 174.6898	0.394 0.570 1.791 4.125 1997 36.775 96.612 61.567 12.788 193.927 53.340 1997 1997 356.137 356.137 356.137 356.137 356.137 124.096 210.653	0.951 0.979 38.315 3.373 51.656 67.135 75.841 30.778 1.168 126.760 57.599 1998 11648 126.94070 698.225 69.567 17.521 170.752	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 298.430 263.116 999.987 96.723 17.706 306.439	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 <b>42</b> .144 4.570 156.545 81.612 <b>2000</b> <b>2000</b> 2000 2000 105.720 164.893 16.349 16.349	3.698 0.173 23.670 5.791 0.208 2001 51.542 39.250 50.619 34.333 2.067 58.593 65.322 2001 415.245 2001 415.245 2003 81 1234.797 100.930 32.613	2.501 0.441 25.780 5.642 <b>2002</b> 33.728 19.475 11.620 51.855 2.065 <b>88.908</b> 44.390 <b>2002</b> <b>2002</b> 412.700 114.991 513.184 138.640 4.180 217.762	1.834 0.835 24.589 4.283 0.237 2003 48.652 23.939 36.810 33.192 14.534 81.248 200.724 2003 2003 293.347 239.724 626.448 157.661 8.276 95.320	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 2004 2004 258.993 247.617 663.898 162.257 9.459 218.601	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289 96.494 2005 245.122 245.122 244.191 936.686 219.500 16.307 362.727	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971 <b>206</b> 204.098 <b>206</b> 224.098 205.330 906.884 254.519 3.525	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 2007 2007 827.945 354.387 996.671 423.714 31.460 371.348	0.162 0.846 21.186 5.297 0.211 2008 76.401 58.131 138.498 75.869 1.020 73.631 58.521 2008 2008 356.717 253.216 713.924 553.669 7.143 39.802	1.571 0.706 17.461 3.601 0.212 2009 76.264 49.573 112.214 64.355 1177.480 51.647 2009 2009 350.291 383.988 507.510 465.203	0.026 0.006 0.000 0.471 n.c. <i>tho Spearman</i> 0.197 -0.544 0.521 0.359 n.c. 0.359 n.c. 0.359 n.c. 0.082 <i>tho Spearman</i> 0.282 0.462 0.462 0.462 0.897 -0.600 0.211
GSA9 GSA10 GSA10 GSA11 GSA16 GSA17 GSA19 GSA17 GSA16 GSA16 GSA17 GSA18 GSA17 GSA18 GSA17 GSA10 GSA10 GSA10 GSA11 GSA16 GSA17 GSA16 GSA17 GSA18 GSA18 GSA17	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 30.572 14.053 <b>5.512</b> <b>1994</b> <b>229.516</b> 127.180 <b>85.391</b> <b>59.996</b>	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 <b>84.561</b> 13.878 <b>85.1246</b> <b>45.461</b> <b>1995</b> 268.521 131.794 <b>685.851</b> <b>81.616</b> 13.528 <b>85.478</b> <b>97.440</b>	1.631 0.770 23.211 1.288 40.652 51.539 40.567 103.915 15.486 64.148 1996 253.986 147.134 735.007 112.503 174.541 176.598	0.394 0.570 1.791 4.125 1997 36.775 96.612 61.567 12.788 193.927 53.340 1997 1997 356.137 350.731 762.155 34.650 124.096 210.653 85.793	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760 57.599 <b>1998</b> 316.481 2694.070 698.225 69.567 17.521 170.752	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 298.430 263.116 999.987 96.723 17.706 306.439 111.030	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 <b>42.144</b> 4.570 156.545 <b>81.612</b> <b>2000</b> <b>2000</b> <b>2000</b> 290.815 135.211 455.720 164.893 16.349 144.544 167.293	3.698 0.173 23.670 5.791 0.208 2001 51.542 39.250 50.619 34.333 2.067 58.593 65.322 2001 0.173 2001 4.15.245 200.381 1234.797 100.930 32.613 118.053	2.501 0.441 25.780 5.642 2002 33.728 19.475 11.620 51.855 2.065 88.908 44.390 2002 412.700 114.991 513.184 138.640 4.180 217.762 49.541	1.834 0.835 24.589 4.283 0.237 2003 48.652 23.939 36.810 33.192 14.534 81.248 200.724 2003 293.347 239.724 626.448 157.661 8.276 95.320	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 69.757 2004 258.993 247.617 663.898 162.257 9.459 218.604	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289 96.494 2005 244.94 2005 245.122 244.191 936.686 219.500 16.307 362.727	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971 <b>1</b> 26.931 39.457 <b>2006</b> <b>2006</b> 224.098 265.330 906.884 265.330 906.884 254.519 3.525 199.318 56.867	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 2007 827.945 354.387 996.671 423.714 31.460 371.348 78.209	0.162 0.846 21.186 5.297 0.211 2008 76.401 58.131 138.498 75.869 1.020 73.631 58.521 2008 356.717 253.216 713.924 553.669 7.143 39.802 182.354	1.571 0.706 17.461 3.601 0.212 2009 76.264 49.573 112.214 64.355 177.480 51.647 2009 250.291 383.988 507.510 465.203	0.026 0.006 0.000 0.471 n.c. <b>rho Spearman</b> 0.197 <b>-0.544</b> 0.359 n.c. 0.111 0.082 <b>rho Spearman</b> 0.282 0.462 -0.043 <b>0.897</b> <b>-0.600</b> 0.211 -0.109
GS.49           GSA10           GSA11           GSA16           GSA17           GSA17           GSA16           GSA17           GSA18           GSA16           GSA17           GSA18           GSA11           GSA11           GSA11           GSA11           GSA11           GSA11           GSA10           GSA11           GSA10           GSA10           GSA11	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 30.572 14.053 <b>5.512</b> <b>1994</b> <b>229.516</b> 127.180 <b>85.391</b> <b>59.996</b>	1.401 0.770 17.777 1.683 <b>1995</b> 83.124 66.919 51.664 <b>84.561</b> 13.878 <b>85.1246</b> <b>45.461</b> <b>1995</b> 268.521 131.794 <b>685.851</b> <b>81.616</b> 13.528 <b>85.478</b> <b>97.440</b>	1.631 0.770 23.211 1.288 40.652 51.539 40.567 103.915 15.486 64.148 1996 253.986 147.134 735.007 112.503 174.541 176.598	0.394 0.570 1.791 4.125 1997 36.775 96.612 61.567 12.788 193.927 53.340 1997 1997 356.137 350.731 762.155 34.650 124.096 210.653 85.793	0.951 0.979 38.315 3.373 <b>1998</b> 51.656 67.135 75.841 30.778 1.168 126.760 57.599 <b>1998</b> 316.481 2694.070 698.225 69.567 17.521 170.752	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 298.430 263.116 999.987 96.723 17.706 306.439 111.030	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 51.017 <b>42.144</b> 4.570 156.545 <b>81.612</b> <b>2000</b> <b>2000</b> <b>2000</b> 290.815 135.211 455.720 164.893 16.349 144.544 167.293	3.698 0.173 23.670 5.791 0.208 2001 51.542 39.250 50.619 34.333 2.067 58.593 65.322 2001 0.173 2001 4.15.245 200.381 1234.797 100.930 32.613 118.053	2.501 0.441 25.780 5.642 2002 33.728 19.475 11.620 51.855 2.065 88.908 44.390 2002 412.700 114.991 513.184 138.640 4.180 217.762 49.541	1.834 0.835 24.589 4.283 0.237 2003 48.652 23.939 36.810 33.192 14.534 81.248 200.724 2003 293.347 239.724 626.448 157.661 8.276 95.320	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 69.757 2004 258.993 247.617 663.898 162.257 9.459 218.604	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289 96.494 2005 244.94 2005 245.122 244.191 936.686 219.500 16.307 362.727	0.488 0.224 10.619 8.925 0.633 <b>2006</b> 50.793 44.434 49.346 47.971 126.931 39.457 <b>2006</b> 224.098 265.330 906.884 254.519 3.525 199.318 56.867 <b>2006</b>	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 2007 827.945 354.387 996.671 423.714 31.460 371.348 78.209	0.162 0.846 21.186 5.297 0.211 2008 76.401 58.131 138.498 75.869 1.020 73.631 58.521 2008 356.717 253.216 713.924 553.669 7.143 39.802 182.354	1.571 0.706 17.461 3.601 0.212 2009 76.264 49.573 112.214 64.355 177.480 51.647 2009 250.291 383.988 507.510 465.203	0.026 0.006 0.000 0.471 n.c. <b>rho Spearman</b> 0.197 <b>-0.544</b> 0.521 0.359 n.c. 0.111 0.082 <b>rho Spearman</b> 0.282 0.462 -0.043 <b>0.897</b> <b>-0.600</b> 0.211 -0.109 <b>rho Spearman</b>
GSA9 GSA10 GSA10 GSA11 GSA16 GSA17 GSA17 GSA19 GSA10 GSA10 GSA17 GSA16 GSA17 GSA18 GSA19 GSA18 GSA19 GSA19 GSA19 GSA10 G	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 <b>3</b> 0.572 <b>14</b> .053 <b>5</b> .512 <b>1994</b> <b>1994</b> <b>229</b> .516 <b>127</b> .180 <b>23</b> .406 <b>1934</b>	1.401 0.770 17.777 1.683 83.124 66.919 51.664 84.561 13.878 51.246 45.461 1995 0.681 1995 0.681 1995 0.681 1995 85.851 81.616 13.528 85.478 97.440 1995	1.631 0.770 23.211 1.288 40.652 51.539 40.567 103.915 15.486 54.864 64.148 1996 147.134 735.007 112.503 174.541 176.898 153.658 1996	0.394 0.570 1.791 4.125 96.612 61.567 12.788 193.927 53.340 1997 356.137 350.731 762.155 34.650 124.096 210.653 85.793 1997	0.951 0.979 38.315 3.373 1998 51.656 67.135 75.841 30.778 1.168 126.760 57.599 1998 316.481 2694.070 698.225 69.567 17.521 170.752 61.716 1998	2.165 1.587 1.587 1.8.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 1999 298.430 263.116 999.987 96.723 17.706 306.439 111.030 1999 1999	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 4.570 156.545 81.612 <b>2000</b> 290.815 81.612 <b>2000</b> 290.815 135.211 455.720 164.893 16.349 144.544 167.293 <b>2000</b>	3.698 0.173 23.670 5.791 0.208 2001 51.542 39.250 50.619 34.333 2.067 58.593 2001 65.322 2001 0.173 2001 415.245 200.381 1234.797 100.930 32.613 118.053 118.053 118.053	2.501 0.441 25.780 5.642 33.728 19.475 11.620 51.855 2.065 88.908 44.390 2002 2002 412.700 114.991 513.184 138.640 41.800 217.762 49.541 2002	1.834 0.835 24.589 4.283 0.237 2003 48.652 23.939 36.810 33.192 14.534 81.248 200.724 2003 293.347 2003 293.347 2003 293.347 2003 239.724 626.448 157.661 8.276 95.320 224.262 2003	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 69.757 2004 2004 258.993 247.617 663.898 162.257 9.459 218.601 113.049 2004	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 244.289 96.494 2005 245.122 245.122 244.191 936.686 219.500 16.307 362.727 106.044 2005	0.488 0.224 10.619 8.925 0.633 2006 50.793 44.434 49.346 47.971 126.931 39.457 2006 224.098 265.330 906.884 254.519 3.525 199.318 56.867 2006 1.384	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007	0.162 0.846 21.186 5.297 0.211 2008 76.401 58.131 138.498 75.869 1.020 73.631 58.521 2008 2008 253.216 713.924 553.669 7.143 39.802 182.354 2008	1.571 0.706 17.461 3.601 0.212 2009 76.264 49.573 112.214 64.355 112.214 64.355 112.214 64.355 2009 2009 2009 2009 2009 2099 2099	0.026 0.006 0.000 0.471 n.c. <b>rho Spearman</b> 0.197 <b>-0.544</b> 0.359 n.c. 0.111 0.082 <b>rho Spearman</b> 0.282 0.462 -0.043 <b>0.897</b> <b>-0.600</b> 0.211 -0.109 <b>rho Spearman</b> n.c.
GS.49           GSA10           GSA11           GSA11           GSA16           GSA17           GSA18           GSA19           GSA11           GSA11 </td <td>0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 <b>3</b>0.572 <b>14</b>.053 <b>5</b>.512 <b>1994</b> <b>1994</b> <b>229</b>.516 <b>127</b>.180 <b>23</b>.406 <b>1934</b></td> <td>1.401 0.770 17.777 1.683 83.124 66.919 51.664 84.561 13.878 51.246 45.461 1995 0.681 1995 0.681 1995 0.681 1995 85.851 81.616 13.528 85.478 97.440 1995</td> <td>1.631 0.770 23.211 1.288 40.652 51.539 40.567 103.915 15.486 54.864 64.148 1996 147.134 735.007 112.503 174.541 176.898 153.658 1996</td> <td>0.394 0.570 1.791 4.125 96.612 61.567 12.788 193.927 53.340 1997 356.137 350.731 762.155 34.650 124.096 210.653 85.793 1997</td> <td>0.951 0.979 38.315 3.373 1998 51.656 67.135 75.841 30.778 1.168 126.760 57.599 1998 316.481 2694.070 698.225 69.567 7.521 170.752 69.567 170.521 170.752 61.716 1998 1998</td> <td>2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 1999 298.430 263.116 999.987 96.723 17.706 306.439 111.030 1999</td> <td>1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 4.570 156.545 81.612 <b>2000</b> 290.815 81.612 <b>2000</b> 290.815 135.211 455.720 164.893 16.349 144.544 167.293 <b>2000</b></td> <td>3.698 0.173 23.670 5.791 0.208 2001 51.542 39.250 50.619 34.333 2.067 58.593 2001 65.322 2001 0.173 2001 415.245 200.381 1234.797 100.930 32.613 118.053 118.053 118.053</td> <td>2.501 0.441 25.780 5.642 2002 33.728 19.475 21.452 2005 2002 2002 2002 2002 2002 2002 2</td> <td>1.834 0.835 24.589 4.283 0.237 2003 48.652 23.939 36.810 14.534 81.248 81.248 81.248 200.724 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 204.2489 203.3477 204.2489 204.2489 205.25977 205.25977 205.25977 205.259777 205.259777 205.25977777777777777777777777777777777777</td> <td>1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 69.757 2004 2004 258.993 247.617 663.898 162.257 9.459 218.601 113.049 2004</td> <td>1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289 96.494 2005 245.122 244.191 936.686 219.500 16.307 362.727 106.044 2005</td> <td>0.488 0.224 10.619 8.925 0.633 2006 50.793 44.434 49.346 49.346 47.971 126.931 39.457 2006 224.098 2006 224.098 265.330 906.884 56.867 2006 1.384 2006</td> <td>2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007</td> <td>0.162 0.846 21.186 5.297 0.211 2008 76.401 58.131 138.498 75.869 1.020 73.631 58.521 2008 2008 253.216 713.924 553.669 7.143 39.802 182.354 2008</td> <td>1.571 0.706 17.461 3.601 0.212 2009 76.264 49.573 112.214 64.355 112.214 64.355 112.214 64.355 2009 2009 2009 2009 2009 2099 2099</td> <td>0.026 0.006 0.000 0.471 n.c. <b>rho Spearman</b> 0.197 <b>-0.544</b> 0.521 0.359 n.c. <b>rho Spearman</b> 0.282 0.462 -0.043 <b>0.897</b> <b>-0.600</b> 0.211 -0.109 <b>rho Spearman</b> n.c. <b>rho Spearman</b></td>	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 <b>3</b> 0.572 <b>14</b> .053 <b>5</b> .512 <b>1994</b> <b>1994</b> <b>229</b> .516 <b>127</b> .180 <b>23</b> .406 <b>1934</b>	1.401 0.770 17.777 1.683 83.124 66.919 51.664 84.561 13.878 51.246 45.461 1995 0.681 1995 0.681 1995 0.681 1995 85.851 81.616 13.528 85.478 97.440 1995	1.631 0.770 23.211 1.288 40.652 51.539 40.567 103.915 15.486 54.864 64.148 1996 147.134 735.007 112.503 174.541 176.898 153.658 1996	0.394 0.570 1.791 4.125 96.612 61.567 12.788 193.927 53.340 1997 356.137 350.731 762.155 34.650 124.096 210.653 85.793 1997	0.951 0.979 38.315 3.373 1998 51.656 67.135 75.841 30.778 1.168 126.760 57.599 1998 316.481 2694.070 698.225 69.567 7.521 170.752 69.567 170.521 170.752 61.716 1998 1998	2.165 1.587 18.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 1999 298.430 263.116 999.987 96.723 17.706 306.439 111.030 1999	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 4.570 156.545 81.612 <b>2000</b> 290.815 81.612 <b>2000</b> 290.815 135.211 455.720 164.893 16.349 144.544 167.293 <b>2000</b>	3.698 0.173 23.670 5.791 0.208 2001 51.542 39.250 50.619 34.333 2.067 58.593 2001 65.322 2001 0.173 2001 415.245 200.381 1234.797 100.930 32.613 118.053 118.053 118.053	2.501 0.441 25.780 5.642 2002 33.728 19.475 21.452 2005 2002 2002 2002 2002 2002 2002 2	1.834 0.835 24.589 4.283 0.237 2003 48.652 23.939 36.810 14.534 81.248 81.248 81.248 200.724 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 204.2489 203.3477 204.2489 204.2489 205.25977 205.25977 205.25977 205.259777 205.259777 205.25977777777777777777777777777777777777	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 69.757 2004 2004 258.993 247.617 663.898 162.257 9.459 218.601 113.049 2004	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289 96.494 2005 245.122 244.191 936.686 219.500 16.307 362.727 106.044 2005	0.488 0.224 10.619 8.925 0.633 2006 50.793 44.434 49.346 49.346 47.971 126.931 39.457 2006 224.098 2006 224.098 265.330 906.884 56.867 2006 1.384 2006	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007	0.162 0.846 21.186 5.297 0.211 2008 76.401 58.131 138.498 75.869 1.020 73.631 58.521 2008 2008 253.216 713.924 553.669 7.143 39.802 182.354 2008	1.571 0.706 17.461 3.601 0.212 2009 76.264 49.573 112.214 64.355 112.214 64.355 112.214 64.355 2009 2009 2009 2009 2009 2099 2099	0.026 0.006 0.000 0.471 n.c. <b>rho Spearman</b> 0.197 <b>-0.544</b> 0.521 0.359 n.c. <b>rho Spearman</b> 0.282 0.462 -0.043 <b>0.897</b> <b>-0.600</b> 0.211 -0.109 <b>rho Spearman</b> n.c. <b>rho Spearman</b>
GS.49           GSA10           GSA11	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 <b>3</b> 0.572 <b>14</b> .053 <b>5</b> .512 <b>1994</b> <b>1994</b> <b>229</b> .516 <b>127</b> .180 <b>23</b> .406 <b>1934</b>	1.401 0.770 17.777 1.683 83.124 66.919 51.664 84.561 13.878 51.246 45.461 1995 0.681 1995 0.681 1995 0.681 1995 85.851 81.616 13.528 85.478 97.440 1995	1.631 0.770 23.211 1.288 40.652 51.539 40.567 103.915 15.486 54.864 64.148 1996 147.134 735.007 112.503 174.541 176.898 153.658 1996	0.394 0.570 1.791 4.125 96.612 61.567 12.788 193.927 53.340 1997 356.137 350.731 762.155 34.650 124.096 210.653 85.793 1997	0.951 0.979 38.315 3.373 1998 51.656 67.135 75.841 30.778 1.168 126.760 57.599 1998 316.481 2694.070 698.225 69.567 17.521 170.752 61.716 1998	2.165 1.587 18.851 1.245 0.188 10.999 70.323 21.586 21.586 21.586 21.586 21.586 21.586 21.586 22.585 22.585 22.585 23.116 999.987 263.116 999.987 11.10.30 263.116 263.116 299.997 11.10.30 263.116 299.997 11.10.30 299.10 11.10.30 299.10 11.10.30 299.10 11.10.30 299.10 11.10.30 299.10 11.10.30 299.10 11.10.30 299.10 11.10.30 200.10 11.10.30 200.10 11.10.30 200.10 11.10.30 200.10 11.10.30 200.100 200.100 200.100 20	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 4.570 156.545 81.612 <b>2000</b> 290.815 81.612 <b>2000</b> 290.815 135.211 455.720 164.893 16.349 144.544 167.293 <b>2000</b>	3.698 0.173 23.670 5.791 0.208 2001 51.542 39.250 50.619 34.333 2.067 58.593 2001 65.322 2001 0.173 2001 415.245 200.381 1234.797 100.930 32.613 118.053 118.053 118.053	2.501 0.441 25.780 5.642 33.728 19.475 11.620 51.855 2.065 88.908 44.390 2002 2002 412.700 114.991 513.184 138.640 41.800 217.762 49.541 2002	1.834 0.835 24.589 4.283 0.237 2003 48.652 23.939 36.810 14.534 81.248 81.248 81.248 200.724 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 203.3477 204.2489 203.3477 204.2489 204.2489 205.25977 205.25977 205.25977 205.259777 205.259777 205.25977777777777777777777777777777777777	1.819 0.217 12.008 3.831 0.221 2004 64.260 34.380 67.142 42.958 40.133 76.957 69.757 2004 2004 258.993 247.617 663.898 162.257 9.459 218.601 113.049 2004	1.139 0.452 31.881 3.773 0.213 2005 56.477 44.675 80.414 40.985 274.289 96.494 2005 245.122 244.191 936.686 219.500 16.307 362.727 106.044 2005	0.488 0.224 10.619 8.925 0.633 2006 50.793 44.434 49.346 47.971 126.931 39.457 2006 224.098 265.330 906.884 254.519 3.525 199.318 56.867 2006 1.384	2.100 1.986 15.153 3.655 0.211 2007 58.633 41.920 104.506 100.522 39.486 42.909 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007	0.162 0.846 21.186 5.297 0.211 2008 5.297 0.211 138.498 5.297 0.211 138.498 5.8521 2008 2008 2008 2008 2008 2008 2008 20	1.571 0.706 17.461 3.601 0.212 2009 76.264 49.573 112.214 64.355 112.214 64.355 112.214 64.355 2009 2009 2009 2009 2009 2099 2099	0.026 0.006 0.000 0.471 n.c. <i>rho Spearman</i> 0.197 -0.544 0.521 0.359 n.c. 0.359 n.c. 0.359 n.c. <i>rho Spearman</i> 0.282 0.462 -0.043 0.6897 -0.043 0.211 -0.109 <i>rho Spearman</i> n.c. <i>rho Spearman</i> n.c.
GSA9           GSA10           GSA11           GSA12           GSA11           GSA11           GSA12           GSA11           GSA12           GSA13           GSA14           GSA14           GSA15           GSA16           GSA17           GSA18           GSA19           H. perio           GSA11	0.849 0.421 12.412 0.527 <b>1994</b> 57.468 95.704 <b>3</b> 0.572 <b>14</b> .053 <b>5</b> .512 <b>1994</b> <b>1994</b> <b>229</b> .516 <b>127</b> .180 <b>23</b> .406 <b>1934</b>	1.401 0.770 17.777 1995 83.124 66.919 51.664 84.561 13.878 84.561 13.878 45.461 13.878 97.40 0.681 13.1794 65.851 81.616 13.528 85.478 97.440 1995	1.631 0.770 23.211 1.288 40.652 51.539 40.567 103.915 15.486 54.864 64.148 1996 147.134 735.007 112.503 174.541 176.898 153.658 1996	0.394 0.570 1.791 4.125 96.612 61.567 12.788 193.927 53.340 1997 356.137 350.731 762.155 34.650 124.096 210.653 85.793 1997	0.951 0.979 38.315 3.373 1998 51.656 67.135 75.841 30.778 1.168 126.760 57.599 1998 316.481 2694.070 698.225 69.567 7.521 170.752 69.567 170.521 170.752 61.716 1998 1998	2.165 1.587 1.587 1.8.851 1.245 0.188 1999 70.323 110.992 80.256 21.586 127.907 61.936 1999 1999 298.430 263.116 999.987 96.723 17.706 306.439 111.030 1999 1999	1.978 0.917 15.875 8.592 0.199 <b>2000</b> 64.424 4.570 156.545 81.612 <b>2000</b> 290.815 81.612 <b>2000</b> 290.815 135.211 455.720 164.893 16.349 144.544 167.293 <b>2000</b>	3.698 0.173 23.670 5.791 0.208 2001 51.542 39.250 50.619 34.333 2.067 58.593 2001 65.322 2001 0.173 2001 415.245 200.381 1234.797 100.930 32.613 118.053 118.053 118.053	2.501 0.441 25.780 5.642 2002 33.728 19.475 21.452 2005 2002 2002 2002 2002 2002 2002 2	1.834 0.835 24.589 44.283 0.207 2003 48.652 23.399 36.810 203 36.810 203 33.192 14.534 200.724 203 29.347 203 29.347 203 29.347 203 29.320 203 29.320 203 224.262 2003 224.262 2003 204 205 2003 204 205 204 205 2003 205 205 205 205 205 205 205 205 205 205	1.819 0.217 12.008 3.831 2004 64.260 64.260 67.142 42.958 40.133 76.957 76.957 7004 2004 28.993 247.6171 66.3898 162.257 9.459 204 204 204 2004	1.139 0.452 31.881 3.773 0.213 56.477 44.675 2005 244.191 2005 245.122 244.191 305.686 219.500 16.307 106.044 2005 0.168	0.488 0.224 10.619 8.925 0.633 2006 50.793 44.434 49.346 49.346 47.971 126.931 39.457 2006 224.098 2006 224.098 265.330 906.884 56.867 2006 1.384 2006	2.100 1.986 3.655 0.211 104.506 104.506 41.200 2007 2007 2007 2007 2007 2007 2007	0.162 0.846 21.186 5.297 0.211 138.498 76.401 58.331 138.498 76.401 58.521 2008 356.717 203 356.717 253.266 7.143 33.9.802 7.143 33.9.802 2008	1.571 0.706 17.461 3.601 76.264 49.573 2009 76.264 49.573 112.214 64.355 1177.480 51.647 2009 350.291 383.988 85.07.510 465.203 183.797 92.929 2009 2009	0.026 0.006 0.000 0.471 n.c. rho Spearman 0.197 -0.544 0.359 n.c. 0.111 0.0521 0.359 n.c. rho Spearman 0.282 0.462 -0.043 0.897 -0.600 0.211 -0.109 rho Spearman n.c. rho Spearman n.c.

Tab. 8 - Biomass index (kg/km<sup>2</sup>) for slope stratum (200-800 m depth) per GSA. Medits 1994-2009. Significant Spearman rho values are in bold.

Indici di biomassa (kglkm<sup>2</sup>) per la scarpata (200-800 m) e per GSA. Medits 1994-2009. In grassetto i valori del rho di Spearman significativi.

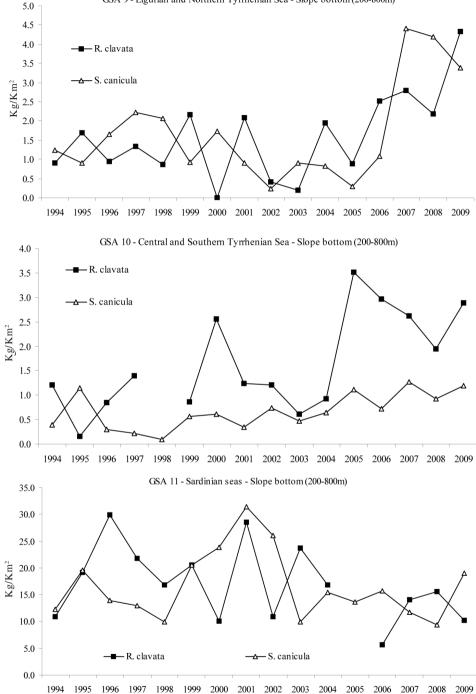
C. granulosus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9	4.237		5.566	5.700	4.156	1.004	0.663	1.809		1.361			2.551	1.907			n.c.
GSA10	2.086	1.589		0.418	3.259	5.572		1.991		0.910	1.673		0.924	1.111	1.518		n.c.
GSA11			6.797			2.186	0.488	1.124			3.417	0.988					n.c.
GSA16	19.187	3.597	2.576		12.438	5.999	15.344	5.315	21.105	4.604	3.749	30.696	25.374	11.568	19.215	23.033	0.511
GSA18						1.723			2.419					0.002			n.c.

(Segue/Follows)

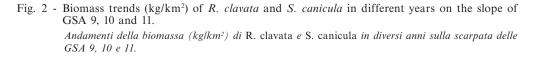
C. uyato	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA10	1))4	1775	1770	1777	1770	1)//	0.794	2001	2002	2003	2004	2005	2000	2007	2000	2007	n.c.
GSA16 GSA16		0.715					0.794						3.873				n.c.
GSA10 GSA19		0.715					0.696						3.873				
C. monstrosa	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	n.c. rho Spearman
GSA9	1,465	1.278	1.628	1.858	2.445	2,484	1.140	0.913	1.414	1.023	1.030	1.537	0.795	1.480	1.126	0.739	-0.544
GSA9 GSA10	0.027	0.102	0.080	0.186	0.145	0.520	1.140	1.011	0.420	0.023	0.025	0.079	0.795	0.005	0.092	0.739	-0.418
GSA10	0.027	0.102	0.080	0.180	0.145	0.320	0.347	0.133	0.420	0.024	0.025	0.079	0.011	0.005	0.092	0.049	-0.418
GSA11 GSA16	5.930	3.976	2.791	2.164	4.933	6.505	9.509	2.742	4.046	6.344	8.009		3.619	3.963	6.852	5.202	
GSA16 GSA17	0.980	3.976	9.789	2.164	4.955	6.505	9.509	5.778	4.046	6.125	3.441	3.563	3.619	3.963	0.852	5.202	0.168
		5.183			10.245	39.328	16 700	37.791	16.946		4.756	15 272	10.756	11.904	7.601	22.000	n.c. -0.024
GSA18 GSA19	12.582	0.227	7.183	25.492 0.865	18.345 0.542		16.708	0.736	0.946	14.327 0.736	4.756	15.372 0.285	12.756		0.823		-0.024
D. licha	0.777 <b>1994</b>		0.237 1996	0.865 1997	0.542 1998	0.768	2.241	2001	2002	2003	2004	2005	0.491	0.229	2008	0.367	
		1995										2005					rho Spearman
GSA9	2.685	0.937	1.426	1.379	2.063	1.189	0.808	0.053	0.666	0.699	0.035		3.610	0.624	0.875	0.883	-0.468
GSA10	4.390		0.064	1.718	0.647	2.868	1.718	2.251	1.114	2.611	4.248	0.093	1.636	0.132		3.481	-0.046
GSA11		1.033		0.047	0.060	5.480		1.720		0.570						1.957	n.c.
GSA16	1.239	0.968	0.086	1.774			2.741	3.992	4.057	5.043	4.665	4.201	3.259	5.864	3.334	6.064	0.785
GSA17	1 5 5 3	0.451		0.318				1.100			0.001	1.076	1.000			0.152	n.c.
GSA18	1.553	3.855	0.061	0.449	2.108	1.7/2	0.170	1.189	1.412	5.812	0.284	4.276	1.002	1.502	0.000	0.153	n.c.
GSA19	100 1	4.286	0.064	1.036	0.211	1.562	2.150	0.407	1.413	2.062	3.565	1.882	2.563	1.503	2.322	1.361	-0.375
D. pastinaca	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA11						11.556											n.c.
GSA16													0.008				n.c.
D. batis	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9			0.002														n.c.
D. oxyrhincus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9	2.264	1.772	0.959	1.341	0.258	0.057	1.838	1.866	1.011	2.314	0.290	1.775	0.845	2.280	0.013	2.713	0.100
GSA10	0.179	0.096	0.269	0.059	0.391	1.803	0.413	0.130	0.882	0.522	0.007	0.316	0.075	1.446	0.486	0.282	0.241
GSA11	10.878	8.487	11.838	1.701	25.019	17.532	14.737	16.443	11.736	24.183	12.973	21.432	5.497	11.163	15.503	16.630	0.253
GSA16	1.581	2.629	1.159	7.858	2.445	0.922	4.435	5.150	6.596	5.204	6.649	5.222	11.625	2.773	7.615	6.481	0.591
GSA19						0.030	0.012	0.042		0.013	0.007	0.425	0.239	0.014	0.010	0.247	n.c.
E.spinax	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9	3.652	4.860	2.788	3.241	4.360	6.432	5.127	4.685	3.049	4.275	5.135	4.872	5.339	3.974	5.517	5.019	0.453
GSA10	6.703	2.696	2.661	5.659	4.193	5.581	2.644	2.095	1.964	1.784	2.615	3.038	2.696	3.320	3.522	3.462	-0.176
GSA11		2.221	2.757	2.757	4.986	5.141		3.567	0.577	2.240	3.539	4.975	3.751	3.675	6.940	5.917	0.560
GSA16	2.477	4.546	5.157	0.726	2.635	2.088	3.895	3.371	4.077	3.027	3.567	3.166	3.830	6.199	6.450	6.690	0.521
GSA17	0.545	0.844	0.299		0.013		0.331	0.010	0.413	1.142	2.207				0.051		n.c.
GSA18	1.894	1.807	1.978	5.051	2.782	4.038	5.554	1.684	4.558	3.904	3.791	10.127	5.354	1.155	2.133	7.331	0.550
GSA19	0.061	1.841	2.249	2.060	2.412	2.993	3.954	3.273	2.619	5.588	2.961	3.613	2.122	2.260	2.594	3.353	0.391
G. galeus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA10		0.023						2.250									n.c.
G. melastomus	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9	35.827	39.769	30.591	39.331	37.735	46.863	45.486	46.325	44.384	27.076	28.861	31.711	33.677	81.273	48.955	34.123	0.050
GSA10	13.571	9.976	12.774	33.048	39.624	29.614	12.772	22.327	9.098	24.838	26.197	30.361	29.338	43.287	28.087	52.719	0.482
GSA11		20.591	37.326	57.566	53.379	42.133	33.543	61.270	40.871	45.322	42.461	40.280	52.328	57.331	40.639	41.317	0.150
GSA16	19.851	9.718	15.557	5.367	11.443	15.812	29.296	16.902	17.459	27.164	28.576	27.730	34.929	55.407	71.033	67.581	0.847
GSA17	3.764	1.804	12.039	13.454	2.208	2.405	2.537	5.975	1.651	1.528	3.594	1.994	0.186	2.569	1.276		-0.514
GSA18	21.756	7.636	12.001	31.442	25.153	43.585	23.455	25.251	31.076	23.114	38.164	57.128	33.300	28.479	6.759	43.824	0.418
GSA19	15.164	6.578	7.752	5.121	5.836	13.562	17.687	15.243	8.198	22.066	12.525	15.737	9.710	8.303	20.498	17.084	0.503
G. altavela	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA19													0.070				n.c.
H. perlo	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	rho Spearman
GSA9										0.256		0.404					n.c.
GSA11						0.162											n.c.
GSA16		1.893			1.349				0.161	0.402	0.424	1.286	0.234	0.533	2.056	0.877	n.c.
GSA19						0.412									1.322		n.c.

Sardinia (GSA11) and the Strait of Sicily (GSA16). A clear positive trend occurs in GSA9 and GSA16. In GSA19 *R. clavata* was not fished, so in Fig. 4 the trend of *T. nobiliana* and *S. canicula* are shown. When the first species decreases the second increases; but this could be fortuitous.

On the slope *G. melastomus* was fished in all GSAs and all years (Fig. 5). The highest values of biomass were obtained in GSA9 (Ligurian and Northern Tyrrhenian Sea) and GSA11 (Sardinia) and in the last years also in GSA16 (Strait of Sicily) where there was an increasing trend of the catch. The lowest values were obtained in the northern and central Adriatic Seas, but this is due mainly to the reduced surface of the slope.



GSA 9 - Ligurian and Northern Tyrrhenian Sea - Slope bottom (200-800m)



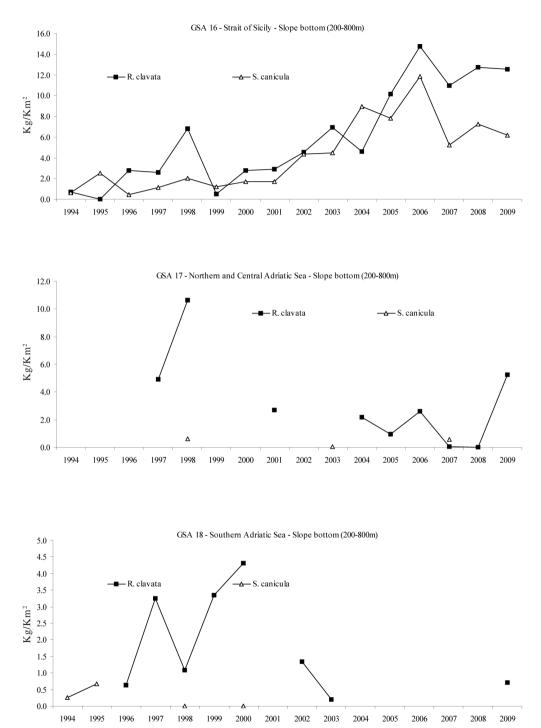


Fig. 3 - Biomass trends (kg/km<sup>2</sup>) of *R. clavata* and *S. canicula* in different years on the slope of GSA 16, 17 and 18. Andamenti della biomassa (kg/km<sup>2</sup>) di R. clavata e S. canicula in diversi anni sulla scarpata delle GSA 16, 17 e 18.

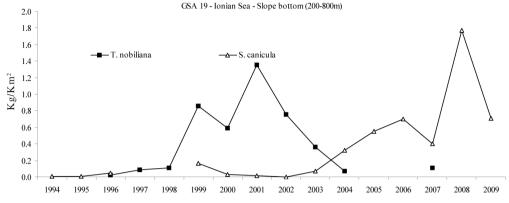


Fig. 4 - Biomass trends (kg/km<sup>2</sup>) of *T. nobiliana* and *S. canicula* in different years on the slope of GSA19. Andamenti della biomassa (kg/km<sup>2</sup>) di T. nobiliana e S. canicula in diversi anni sulla scarpata



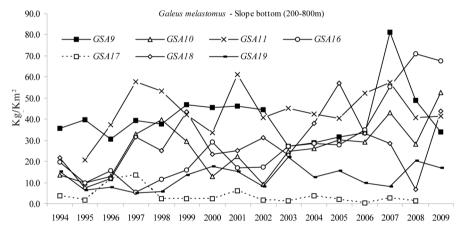
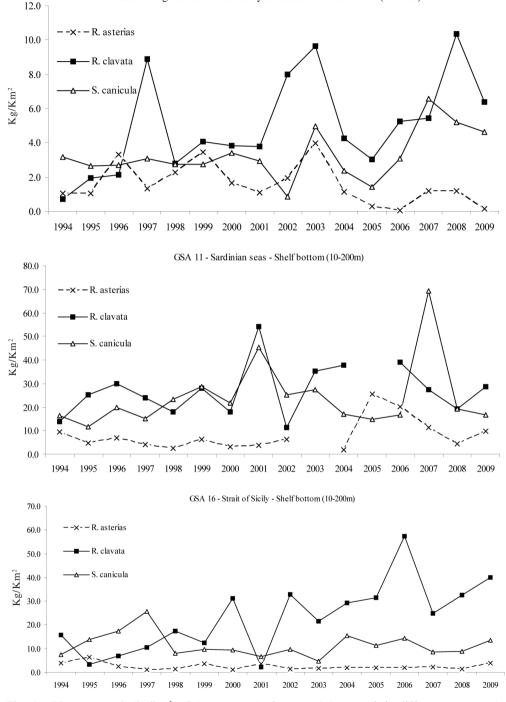
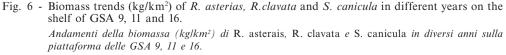


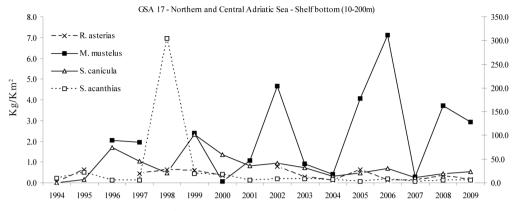
Fig. 5 - Biomass (kg/km<sup>2</sup>) of G. melastomus caught in different years on the slope of seven GSAs. Biomassa (kg/km<sup>2</sup>) di G. melastomus presente nei diversi anni sulla scarpata delle sette GSA.

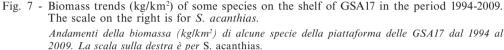
*R. clavata* and *S. canicula* were also caught in the shelf bottoms and the biomass trends of these two species and of the *R. asterias* in three GSA are shown in Fig. 6. The highest biomass was fished in Sardinia (GSA11) and in Sicily (GSA16). The biomass trends of some species fished on the shelf of Northern and Central Adriatic seas are given in Fig. 7. There was an exceptional catch of *S. acanthias* (304 kg/km<sup>2</sup>) in the 1998 survey, where normally the catch is between 3 and 22 kg/km<sup>2</sup>. The catch of *M. mustelus* is irregular. This species was caught in good quantity (31 kg/km<sup>2</sup>) in GSA19 during the 2009 survey (Fig. 8). The total biomass of chondrichthyes caught each year during the Medits surveys is given in Fig. 9. The highest values were obtained in Sardinia (GSA11) and Sicily (GSA16), while the lowest were in the Southern Adriatic (GSA18) and Ionian Seas (GSA19). There are no clear trend, positive or negative.

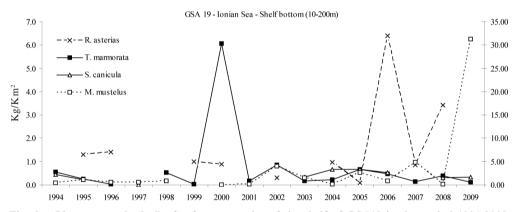


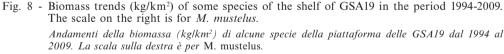
GSA 9 - Ligurian and Northern Tyrrhenian Sea - Shelf bottom (10-200m)











**Conclusions** - During the Medits surveys 16 sharks out of 22 demersal species listed in the checklist of Italian Fauna (Vacchi and Serena, 2010) were fished. All torpedos and 12 skats out of 16, 6 Myliobatiformes out of 9 (some are pelagic) were caught.

In a previous paper (Bertrand *et al.*, 2000) dealing with elasmobranches caught in the whole area covered by the Medits surveys from 1994 to 1998, 44 species were described: 1 chimaera, 19 sharks and 24 rays and skates, of which 35 species are common to the present work. *G. altavela*, *M. punctulatus* and *P. bovines* were not fished in the period 1994-1998, while *S. squatina*, *S. aculeata*, *Galeus atlanticus* (not present in Italian waters), *Hexanchus vitelus* (=*H. nakamurai* only one record in Italy), *Raja naevus*, *R. radula*, *R. undulate*, *Dasyatis tortonesei* (not considered a valid species), *Rhinoptera marginata* are not mentioned in the present paper.

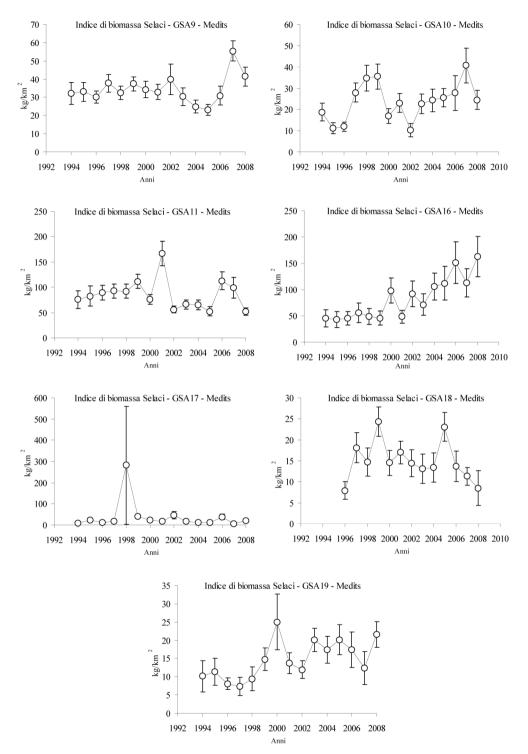


Fig. 9 - Trends of the total biomass of Chondrichthyes in the 7 GSAs. Andamenti della biomassa totale dei Condroitti nelle 7 GSA.

When we compare these data, we have to bear in mind the different areas and numbers of years considered. For the Italian seas important data come from the GRU.N.D. surveys carried out from 1985 to 1998 (Relini *et al.*, 2000). During the Grund surveys all the species recorded in the present paper were found with the exception of *Gymnura altavela*. The species *R. radula*, *R. naevus*, *R. rondeleti* (not valid species), *R. undulata*, *M. mobular* and *S. squatina* fished in Grund surveys were not caught during the 1994-2009 Medits surveys. Although comparison and conclusions are not easy, we can recognize a reduction in the number of species of rays and the disappearance of the Squatina species. According to the Medits data, the situation of elasmobranches seems quite stable in the period 1994-2009 both in terms of number of species and biomass. This conflicts with some landing data collected during the Elasmoit project (Relini *et al.*, 2010) which showed low numbers of species and individuals and poor quantity in weight.

In conclusion, we can say that during the Medits surveys there were no changes in the demersal elasmobranch population, whereas there are changes if we compare the Medits data with data collected before 1994. The main difference, as mentioned earlier, is the reduction in the number of rays and the disappearance of the *Squatina* species.

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