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DISTRIBUTION AND DENSITY OF THE BENTHIC MICROALGA *CHRYSOPHAEUM TAYLORII* LEWIS & BRYAN FROM NORTHERN TO CENTRAL-EASTERN SARDINIAN COASTS

DISTRIBUZIONE E DENSITÀ DELLA MICROALGA BENTONICA CHRYSOPHAEUM TAYLORII *LEWIS & BRYAN DALLE COSTE NORD A QUELLE CENTRO ORIENTALI DELLA SARDEGNA*

Abstract *– In August 2009 the distribution and density of the alien microalga* Chrysophaeum taylorii *Lewis & Bryan (Pelagophyceae) were investigated on hard benthic substrates in seventeen sites from northern to central-eastern Sardinia, in order to estimate the distribution and abundance of this species in the area.*

Key-words: *algal blooms, distribution, introduced species, phytobenthos.*

Introduction – *Chrysophaeum taylorii* Lewis & Bryan is a benthic microalga, typical of coral reefs (Schaffelke, 2004), responsible for the production of mucilaginous material. In the summer of 2007 hard benthic substrates in Tavolara-Punta Coda Cavallo Marine Protected Area (TPCC MPA) and in La Maddalena Marine National Park (LM NP) were affected by the first *C. taylorii* bloom recorded in the Mediterranean Sea (Lugliè *et al.*, 2008). Although monitoring activities carried out in 2008 at TPCC MPA confirmed the presence of the species in this area (Caronni *et al.*, 2009), no data were available for the rest of the coast, LM NP included. The aim of this study is to estimate the occurrence of *C. taylorii* across several hundreds of kilometres of coasts, from LM NP southward along the central-eastern costs of Sardinia.

Materials and methods – In August 2009, seventeen sites were selected along the coast from La Maddalena Archipelago to Arbatax Gulf. At each site two microbenthos samples were collected by sucking water and biological material with a cut-off syringe from a rocky surface (15 cm^2), according to Abbate *et al.* (2007). All samples were collected at 1,5 m of depth, where the highest *C. taylorii* cell density had been previously recorded, and fixed with Lugol's solution. Cells identification and count were performed in two subsamples for each sample according to Utermöhl's sedimentation method (Abbate *et al.*, 2007). A two-way ANOVA (GMAV 5) was used to investigate for differences due to the site (17 levels) and to the sample (2 levels) nested within site (n=2).

Results – *C. taylorii* was found in thirteen of the seventeen investigates sites. The microalga was not found in Santo Stefano, Capo Comino, Isolotto Ogliastra and La Caletta samples while the highest average densities of the species were recorded in Moneta, Porto Ottiolu and Sos Aranzos samples (98343 cells cm^{-2}; 80045 cells cm^{-2}; 77937 cells cm^{-2} respectively). Data about distribution and density of *C. taylorii* in the study area are reported in detail in Tab. 1.

The performed two way ANOVA showed statistically significant differences in the microalgae cell densities both between samples (ANOVA, $F_{17,34}=6.5$ $P<0.05$) and among different study sites (ANOVA, $F_{16,17}=270817.73$ $P<0.05$).

Tab. 1 - *C. taylorii* densities in the two analysed subsamples (SS) of each sample (S) collected in the seventeen study sites.

Densità di C. taylorii *nei due subcampioni (SS) analizzati di ciascun campione (S) raccolto nei diciassette siti di campionamento.*

	C. taylorii densities (cells cm^{-2})			
	S1		S2	
Study site	SS1	SS2	SS1	SS2
Moneta	98251	98134	98511	98476
Cala Coticcio	34072	34105	33892	33929
Santo Stefano	-	-	-	-
Porto Palma	943	961	902	913
Isola delle Bisce	3497	3484	3521	3539
Li Nibari	21978	21956	21991	21971
Scoglio dei poveri	6310	6286	6234	6335
Mortorio	34822	34846	34986	34932
Marinella	58212	58236	58148	58364
Sos Aranzos	77983	77948	77895	77921
Porto San Paolo	6732	6751	6521	6601
Porto Ottiolu	80104	80158	79821	80095
La Caletta	-	-	-	-
Capo Comino	-	-	-	-
Cala Gonone	91	85	78	86
Cala Luna	411	427	459	442
Isolotto Ogliastra	-	-	-	-

Conclusions – The significant differences in *C. taylorii* densities between samples in the same site highlight the variability of this microalga abundance between close areas, as already suggested in other studies (Caronni *et al.*, unpublished data). The presence of *C. taylorii* at both LM NP and TPCC MPA two years after the first record suggests that this species has been settling steadily along the north-east Sardinian coast, confirming its "identity crisis" (Sparrow & Heimann, 2007). *C. taylorii* abundance was significantly variable among sites; remarkable densities were found in most of the northern investigated sites, while among the central-eastern sites high abundances were registered only in Porto Ottiolu, thus indicating that *C. taylorii* is expanding its distribution along this coast, as hypothesized by Luglié *et al.* (2008).

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