



NATIONAL MARINE PARK OF ZAKYNTHOS

IN COLLABORATION WITH UNIVERSITY OF AEGEAN, DEPT. OF MARINE SCIENCE



2nd Annual
Report
2014 - 2015

CORALLIGENOUS SURVEY IN THE NORTH – EAST MEDITERRANEAN



CIGESMED

Seas-era
EUROPEAN SEA-ERA NETWORK

IN THE FRAMEWORK OF EUROPEAN PROJECT
ANR12 SEAS 0001-01 - CIGESMED

ZAKYNTHOS APRIL 2015

CORALLIGENOUS SURVEY IN THE NORTH – EAST MEDITERRANEAN

2nd Annual Progress Report

Reporting Period: 2014-2015

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WORKING GROUP

Name	Affiliation	Specific tasks
Drosos Koutsoubas	NMPZ/ Univ. of the Aegean	<u>Project coordinator</u>
Laurent Sourbes	NMPZ	Report preparation, administrative and communication tasks
Charalampos Dimitriadis	NMPZ	Report preparation, administrative and communication tasks, field work
Vasilis Gerovasileiou	Univ. of the Aegean / HCMR	Report preparation, communication tasks, field work
Maria Sini	Univ. of the Aegean	Report preparation, communication tasks, field work
Zinovia Erga	Univ. of the Aegean / CNRS	Laboratory work
Vatikiotis Konstantinos	NMPZ	Field work
Katsoupis Christos	NMPZ	Field work

NATIONAL MARINE PARK OF ZAKYNTHOS

[HTTP://www.nmp-zak.org](http://www.nmp-zak.org)

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Front page photos: K. Vatikiotis, C. Dimitriadis

1. INTRODUCTION

The current document is the second Annual Progress Report (2nd reporting period) of activities that were undertaken by the National Marine Park of Zakynthos as a subtask in the framework of the European Project CIGESMED according to deliverable requirements of the contract (Ref CNRS: DR12-JE 093 579) signed by NMPZ and CNRS. It includes the tasks and activities carried out from February 2014 until April 2015. The activities of the subtask ‘*Coralligenous Survey in the North – East Mediterranean*’ and their relation to the Work Packages (WP) of CIGESMED Project are presented in Table 1.

Table 1: NMPZ’s activities and their relation to CIGESMED Project WPs

NMPZ Activities	Description	Connection to CIGESMED WP’s
Activity 1	Coralligenous assessment and monitoring	WP2 - <i>Coralligenous assessment and threats in the different basins</i> WP3 - <i>Indicators’ development and test</i>
Activity 2	Management tools	WP4 - <i>Innovative monitoring tools</i> WP6 - <i>Data management, mapping and assimilation tools</i>
Activity 3	Participatory process- Promotion -Public awareness activities	WP5 - <i>Citizen science network implementation</i> WP7 - <i>Outreach, dissemination and stakeholder engagement</i>

2. 2nd GENERAL ASSEMBLY OF CIGESMED PROJECT

D. Koutsoubas, M. Sini and V. Gerovasileiou, members of the NMPZ/University of the Aegean work team, participated in the General Assembly of CIGESMED project which was held in Izmir, Turkey from the 6th to the 9th of May 2014. During the meeting they had the opportunity to discuss with other Project participants as well as to present the results derived from the 1st reporting period (1st Annual Report) with respect to Zakynthos study sites and Project objectives (Figure 1).

The members of the NMPZ/University of the Aegean work team exchanged ideas and technical knowledge regarding field work (e.g. study sites, protocols), preliminary results (e.g. species lists), data analyses, citizen science, and potential post-CIGESMED initiatives.

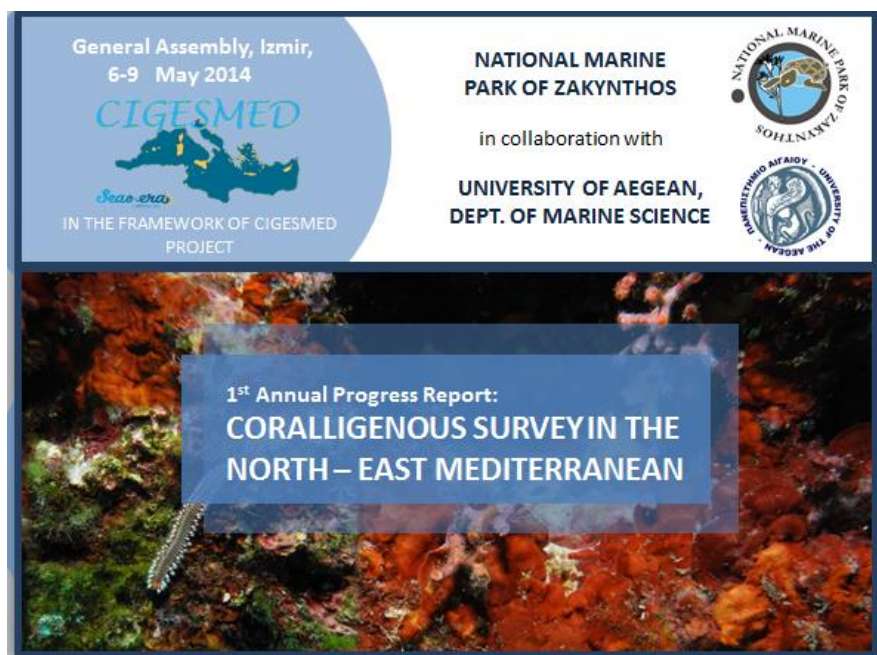


Figure 1: Presentation of NMPZ/University of the Aegean work team progress with respect to the 1st reporting period of CIGESMED project

3. PARTICIPATION IN SCIENTIFIC SYMPOSIA

Z. Erga, D. Koutsoubas, V. Gerovasileiou and M. Sini, members of the NMPZ/University of the Aegean working group along with other members of the CIGESMED Working Group, presented part of the CIGESMED results to the 7th National Conference of the Hellenic Ecological Society (HELECOS) ‘*Ecology: Linking Systems, Climaxes and Research Topics*’, where they participated with the following Poster contribution:

- Erga Z., David R., Guillemain D., Zuberer F., Dailianis T., Gerovasileiou V., Sini M., Koutsoubas D., Verlaque M., Féral J-P. & A. Chenuil: *Distribution of genetic diversity within Lithophyllum stictaeforme/cabiochiaie in the NW Mediterranean*, 7th National Conference of the Hellenic Ecological Society (HELECOS), 9-12 October 2014, Mytilene, Greece.

M. Sini and V. Gerovasileiou, members of the NMPZ/University of the Aegean working group, participated in the three Symposia on the ‘*Conservation of Mediterranean Marine Key Habitats*’, which were organized by the RAC-SPA/UNEP-MAP in Portoroz, Slovenia, on 27-31/10/2014:

- 5th Mediterranean Symposium on Marine Vegetation (27-28 October 2014)
- 2nd Mediterranean Symposium on the conservation of Coralligenous and other Calcareous Bio-concretions (29-30 October 2014)

- 1st Mediterranean Symposium on the conservation of Dark Habitats (31 October 2014)

Members of the NMPZ/University of the Aegean working group presented the results of their individual research activities on Eastern Mediterranean sciaphilic assemblages and also contributed to the following CIGESMED Poster contribution:

- Çinar M.E., Feral J-P., Arvanitidis C., David R., Taşkin E., Dailianis T., Doğan A., Gerovasileiou V., Dağlı E., Aysel V., Issaris Y., Bakir K., Salomidi M., Sini M., Açık S., Evcen A., Dimitriadis C., Koutsoubas D., Sartoretto S., Önen S. and contributors, 2014. Preliminary assessment of coralligenous benthic assemblages across the Mediterranean Sea. 207-208. [In Bouafif C., Langar H. and A. Ouerghi (editors). 2014. Proceedings of the second Mediterranean Symposium on the conservation of Coralligenous and other Calcareous Bio-Concretions. RAC/SPA, Tunis, 247 pp.].

During the Symposia members of the NMPZ/University of the Aegean working group discussed with other CIGESMED partners from CNRS (France) and Ege University (Turkey) about the ongoing progress of different work packages, and potential post-CIGESMED initiatives.

Finally, D. Koutsoubas has briefly presented the CIGESMED Project in the framework of the 3rd International Workshop on Advancing Conservation Planning in the Mediterranean Sea, “Light and shade in the management and conservation of the Mediterranean Sea: Priorities for the near future”, 8-10 April, Lecce (Italy).

4. INTERNAL MEETING OF GREEK PARTNERS

During the 22nd and 23rd of December 2014, NMPZ organized an internal project meeting (held in Thessaloniki, Greece), between NMPZ, University of Aegean and HCMR work team members. During this meeting D. Koutsoubas, C. Dimitriadis, V. Gerovasileiou and C. Arvanitidis discussed several issues regarding the progress of the various CIGESMED work packages, and set up a preliminary time-schedule including future tasks that need to be realized at Zakynthos Island.

5. PROCUREMENT OF EQUIPMENT

In November 2014, NMPZ was equipped with HOBO Water Temperature Pro v2 data loggers (Figure 2), which will be installed at Zakynthos sampling sites during the next sampling period, in order to set up a long-term benthic temperature sampling station. Loggers’ data are anticipated to contribute to the monitoring and the better understanding of the local environmental conditions.



Figure 2: Onset's Waterproof Data Logger system which will be installed at Zakynthos sampling sites for a long –term temperature monitoring.

6. ACTIVITIES RELATED TO CITIZENS SCIENCE WP

V. Gerovasileiou and M. Sini, transferred knowledge and experiences obtained by the NMPZ management authority during previous Citizen Science Projects, and, in collaboration with HCMR, they contributed to the overall design and development of the CIGESMED Citizen Science approach. Furthermore, they participated in the Report writing for the CIGESMED Project “Work Package 5: Citizen Science Network Implementation”.

7. FIELD WORK

As stated in the 1st Progress Report, due to the scarcity of coralligenous formations in Zakynthos that was evidenced during the preliminary surveys, further site investigation was considered essential in order to determine the optimum sampling location(s). In this context, an additional joint NMPZ/University of the Aegean and HCMR survey from members of the Working Groups took place during June 2014 in order to further investigate the previously identified locations.

Site exploration for coralligenous communities

The survey focused on the most promising locations of last year's survey, that is Keri and Mavros Kavos (see 1st Interim Progress Report). This area is located at the SW part of Zakynthos Island, close to the westernmost boundaries of the NMPZ protected area and is characterized by relatively cool water temperatures, possibly due to direct exposure to the open Ionian Sea and local wind-driven upwelling. The location can be characterized as generally pristine, yet it should be noted that it is included among the most popular recreational diving areas of the island, and is regularly visited by groups of divers every day during the summer period (May to October) in an organized way by the local Diving Clubs. The latter means that dive masters and instructors usually escort groups of divers, while during pre-dive briefing sessions they inform divers about the protection measures that are active in the Protected Area of the NMPZ, the fragility of marine organisms and the importance of their habitats (established after close collaboration with the scientific personnel of the NMPZ Management Agency). Extensive vertical rocky walls with crevices, overhangs and numerous submerged caves characterize the topography of the specific location. Rocky cliffs starting from 100-150 m above sea level drop vertically to depths down to 30-40 m. These geomorphological features account for the increased shadowy conditions observed locally over the greatest part of the day. The selection of new diving sites was based on examination of the superficial morphology of the coast, study of the bathymetry of the area, alongside relevant information provided by the local Diving Clubs and by in situ observations made by the scientific personnel of the NMPZ management agency involved in the CIGESMED Project based on previous diving experience. A total, of five sites were investigated (Figure 3; Table 2) over this particular site exploration.

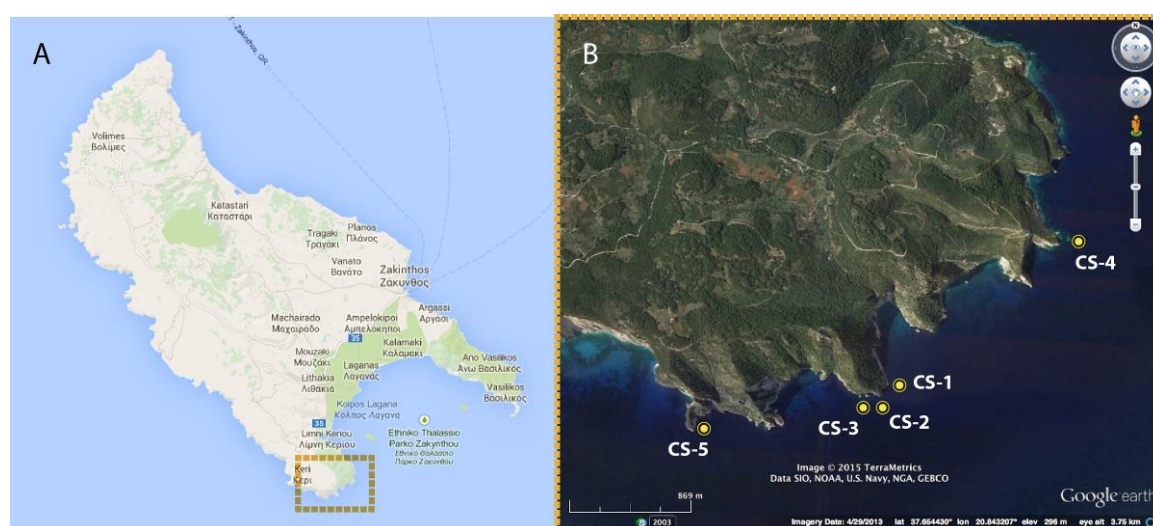


Figure 3: Map of Zakynthos (A) showing the surveyed area and the five potential candidate sites investigated (B).

Table 2: Coordinates and depth range of the potential candidate sites surveyed at Zakynthos.

Site name	Latitude	Longitude	Depth range
CS-1	37.647284°	20.845715°	15-20 m
CS-2	37.646343°	20.844765°	23-25 m
CS-3	37.646158°	20.843603°	25-29 m
CS-4	37.656884°	20.860451°	30-35 m
CS-5	37.644985°	20.830411°	15-25 m

At least one exploratory dive was performed at each site, the aim of which being to assess the existence and extent of coralligenous communities, as well as to provide a rough estimation of topography and depth range. Sites CS-1, CS-2 and CS-3 were considered as the most suitable for studying coralligenous communities in the framework of the CIGESMED Project (Figures 4-6). Sites CS-4 and CS-5 were excluded from further investigation, due to interrupted or rare presence of coralligenous formations (which were mainly in the form of enclaves). Specifically, CS-4 featured a steep muddy slope extending down to 35 m depth, with emerging irregular rocky outcrops forming small walls, crevices and overhangs. However, the absence of shadowy conditions resulted in the restricted development of sciaphilic assemblages mainly under overhangs, in crevices, or within *Posidonia oceanica* rhizomes, while on the upper surface of the rocks photophilic algae species (mostly *Cystoseira* spp.) patches predominated (Figure 7). At CS-5, coralligenous enclaves were confined at the semi-vertical walls at the entrance of a semi-submerged marine cave, thus not extending at a length suitable for deploying transects (Figure 8). Out of the cave photophilic algae dominated assemblages prevailed.

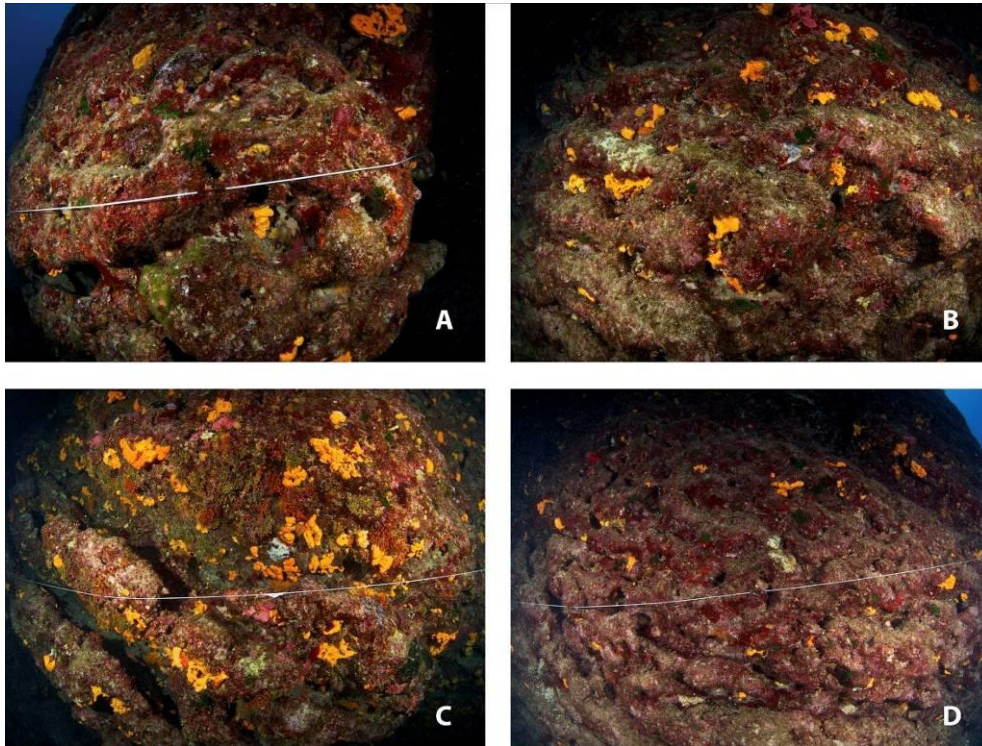


Figure 4: Photos showing coralligenous assemblages across the transect line at site CS-1.

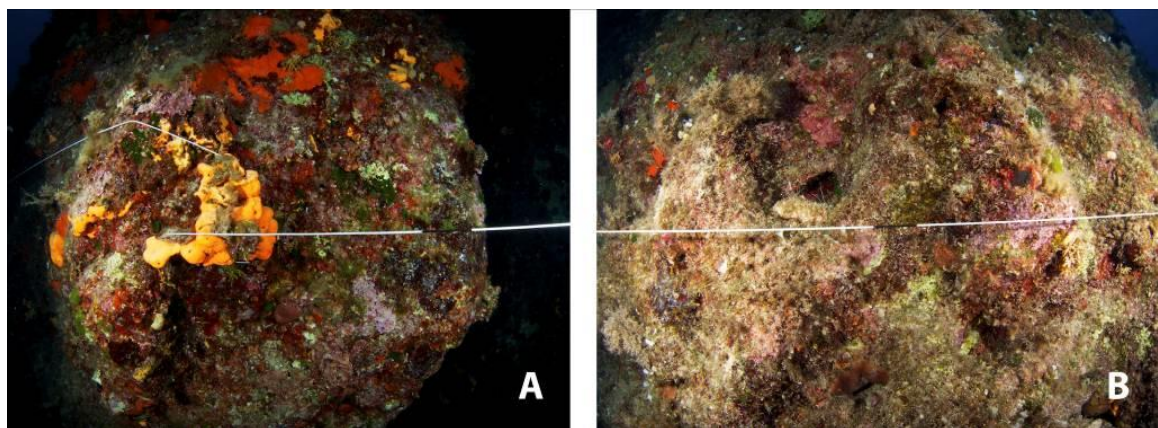


Figure 5: Photos showing coralligenous assemblages across the transect line at site CS-2.



Figure 6: Photos showing coralligenous assemblages across the transect line at site CS-3.

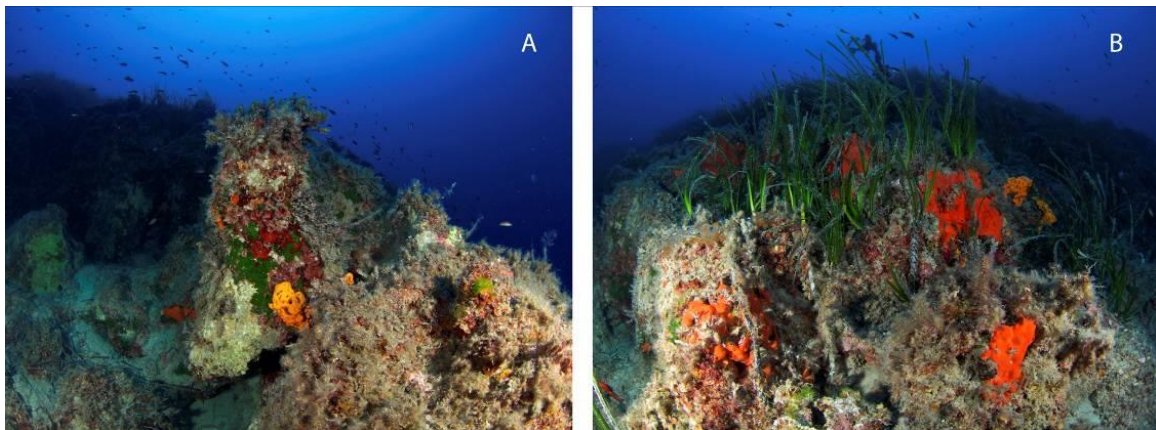


Figure 7: Aspects of potential candidate site CS-4, showing limited coralligenous formations under overhangs (A) or pre-coralligenous communities combined with *Posidonia oceanica* patches (B).



Figure 8: Aspect of potential candidate site CS-5, showing limited coralligenous enclaves confined at the semi-vertical walls at the entrance of a semi-submerged cave.

Characterization and mapping of the selected sites

According to information obtained during the exploratory phase at each site, a marked nylon line or a measuring tape (i.e. the sampling transect) was set-up along those parts of the wall that were characterized by a representative cover of coralligenous communities. The sampling transect was used in order to describe community composition, as well as the main structural characteristics of the

habitat, using the following field methods. At each five-meter segment of the transect, a diver recorded topographic parameters (i.e. orientation, inclination and rugosity (see Appendix of present report – “*Habitat Mapping Protocol*”). Along the same five-meter segments, a second diver estimated biotic cover through visual census (see Appendix of present report – “*Biotic Cover Protocol*”). Additionally, biotic cover was also estimated using the first steps of the rapid visual assessment (RVA) approach (Gatti et al., 2015; see Appendix of present report – “*RVA Protocol*”). Finally, wide-angle photo-samples were taken by means of a Panasonic 8 mm fisheye lens on an Olympus OM-D E-M5 micro 4:3 camera, at predetermined length intervals of 5 m distance. At each step two photo-samples were taken: one close-up, roughly covering a surface of 1 to 2 m², and a general aspect photograph covering a more extended area. This was done in order to obtain a photographic archive of each transect that enables validation of the *in situ* visual assessment, as well as for future reference. All field sampling techniques used follow the requirements of the proposed CIGESMED Protocols (Module 1: Protocol «*Profiles and stands cartography*»).

Recorded topographic data for the three selected Zakynthos sites are presented in Table 3, while the studied transects are illustrated in Figure 9, according to the estimated orientation. A total of 105 meters of coralligenous communities was assessed, at an average depth of 28 m. Representative photographs from each site’s transect are presented in Figures 4 to 6.

Table 3: Topographic characteristics of the three selected Zakynthos sites as recorded *in situ* (inclination and rugosity abbreviations according to the CIGESMED protocol – V: vertical; C: ceiling; T: tiny; S: small; M: medium; L: large)

	Segment (m)	Orientation	Inclination	Rugosity
SITE CS-1	0-5	SW	V	S
	5-10	W	V	L
	10-15	SW	C	L
	15-20	S	V	M
	20-25	S	C	L
	25-30	SE	V	M
	30-35	NE	V	L
	35-40	NE	C	S
	40-45	E	C	S
	45-50	SE	V	T
SITE CS-2	0-5	SE	V	S
	5-10	S	V	M
	10-15	S	V	M
	15-20	SE	V	M
SITE CS-3	0-5	S	V	S
	5-10	E	V	M

10-15	SE	V	S
15-20	S	V	S
20-25	S	V	M
25-30	SW	V	M
30-35	SE	V	L



Figure 9: Tracing of the diving transects surveyed at each studied site. Each site consists of 5-meter segments of varying orientation.

Species recorded in the study sites

A total of 50 taxa belonging to 10 major taxonomic groups (Table 4) were recorded at the selected sites during the fieldwork, mostly consisting of macroalgae (11) and sponges (11) (Figure 10). The highest number of taxa was recorded at site CS-1 (44), followed by CS-3 (27) and CS-2 (16). Furthermore, samples of the bryozoan *Myriapora truncata* and encrusting calcareous algae (whilst targeting samples of *Lithophyllum* spp.) were collected for genetic analysis. Given the characteristics of the sites, the proposed CIGESMED Protocol (Module 4: ‘*Sampling protocol for population genetics*’) could not be followed, as the coralligenous communities were not continuous, and it was not possible to obtain sufficient amount of samples from predetermined orientations and slopes. The collected samples for genetic analysis were properly dried and stored in bottles and then were forwarded to CNRS for further laboratory genetic analyses.

Table 4: Species recorded *in situ* at the three selected Zakynthos sites

Taxa / Site	Site CS-1	Site CS-2	Site CS-3
Macroalgae			
<i>Codium bursa</i> (Olivi) C.Agardh	+	+	+
<i>Codium coralloides</i> (Kützinger) P.C. Silva	+		
<i>Palmophyllum crassum</i> (Naccari) Rabenhorst	+	+	+
<i>Cystoseira</i> spp.	+	+	+
<i>Padina pavonica</i> (Linnaeus) Thivy	+	+	+
<i>Lithophyllum</i> spp.	+		+
<i>Neogoniolithon mamillosum</i> (Hauck) Setchell & L.R.Mason			+
<i>Mesophyllum</i> spp.	+	+	+
<i>Peyssonnelia rubra</i> (Greville) J.Agardh	+		+
<i>Peyssonnelia squamaria</i> [(S.G.Gmelin) Decaisne,1842]	+		+
<i>Peyssonnelia</i> spp.		+	+
Porifera			
<i>Agelas oroides</i> Schmidt, 1864	+	+	+
<i>Chondrosia reniformis</i> Nardo, 1847	+	+	+
<i>Cliona celata</i> Grant, 1826	+		
<i>Cliona schmidtii</i> (Ridley, 1881)	+		
<i>Cliona viridis</i> (Schmidt, 1862)	+	+	+
<i>Haliclona (Soestella) mucosa</i> Griessinger, 1971	+		
<i>Pleraplysilla spinifera</i> Schulze, 1879	+		
<i>Spirastrella cunctatrix</i> Schmidt, 1868	+	+	+
<i>Ircinia</i> spp.	+		
<i>Phorbas tenacior</i> Topsent, 1925			+
<i>Dictyonella</i> spp.			+
Anthozoa			
<i>Caryophyllia (Caryophyllia) inornata</i> Duncan, 1878	+		
Hydrozoa spp.	+		
<i>Madracis pharensis</i> Heller, 1868	+	+	+
<i>Leptopsammia pruvoti</i> Lacaze-Duthiers, 1897	+	+	+
Polychaeta			
<i>Bispira volutacornis</i> Montagu, 1804	+		
<i>Myxicola infundibulum</i> (Montagu, 1808)	+		
<i>Sabella spallanzanii</i> Gmelin, 1791	+		
<i>Protula</i> spp. Montagu, 1803	+		
<i>Serpula vermicularis</i> Linnaeus, 1767	+		+
<i>Hermodice carunculata</i> (Pallas, 1766)	+		
Mollusca			
<i>Lithophaga lithophaga</i> (Linnaeus, 1758)	+		
<i>Rocellaria dubia</i> (Pennant, 1777)	+		
<i>Thylacodes arenarius</i> (Linnaeus, 1758)	+		
Vermetidae spp.	+		
Crustacea			
<i>Dardanus calidus</i> (Risso, 1827)	+		
<i>Palinurus elephas</i> (Fabricius, 1787)			+
<i>Scyllarides latus</i> (Latreille, 1803)	+		
Echinodermata			
<i>Holothuria sanctori</i> Delle Chiaje, 1823	+		
<i>Ophiaster ophidianus</i> Lamarck, 1816	+		+
<i>Sphaerechinus granularis</i> Lamarck, 1816			+
Bryozoa			
<i>Adeonella calveti</i> Canu & Bassler, 1930	+	+	+
<i>Myriapora truncata</i> Pallas, 1766	+	+	+

<i>Reptadeonella violacea</i> (Johnston, 1847)	+		
<i>Rhynchozoon</i> spp.	+	+	+
<i>Schizomavella</i> spp.	+		+
Tunicata			
<i>Halocynthia papillosa</i> Linnaeus, 1767	+	+	+
<i>Microcosmus sabatieri</i> Roule, 1885	+		
<i>Miniacina miniacea</i> Pallas, 1766	+		
Total species number	44	16	27

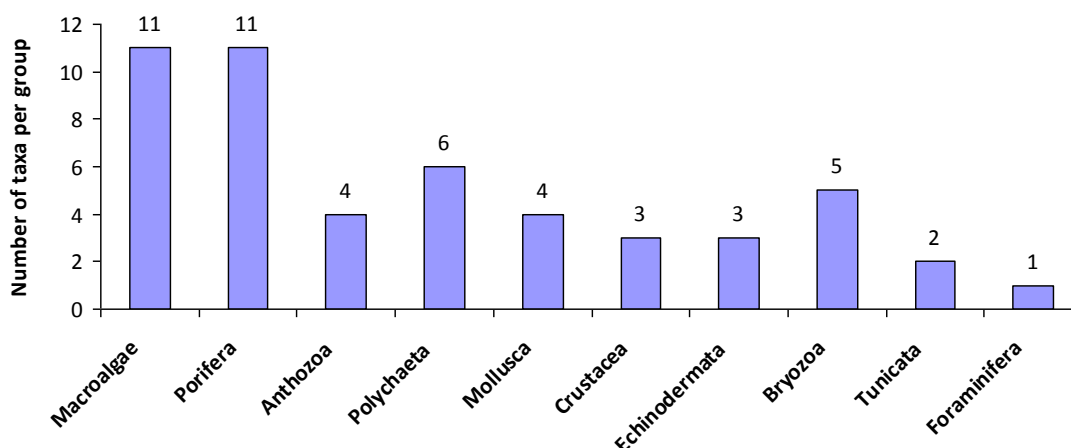


Figure 10: Number of taxa recorded at the three study sites of Zakynthos per taxonomic group.

Easy methods for biodiversity and good health assessments

The assessment of coralligenous communities in the study area of the NMPZ was performed by two divers. The first diver estimated visually (Figure 11) the percent spatial coverage of sessile biota in the three sites described above. The followed methodology was based on the CIGESMED protocol (Module 1: Protocol «*Profiles and stands cartography*») with modifications (see Appendix 1-3 at the end of the Report). The scientific diver estimated in each segment of the transect line (5 m width x 2 m height) the percent coverage of the following 9 morphological and taxonomic categories: calcareous encrusting algae, non-calcareous encrusting algae, erect algae, turf-forming algae, encrusting sponges, massive sponged, scleractinians, encrusting bryozoans, and erect bryozoans. Furthermore, the diver created a list of the species recorded across the transect line at each site.

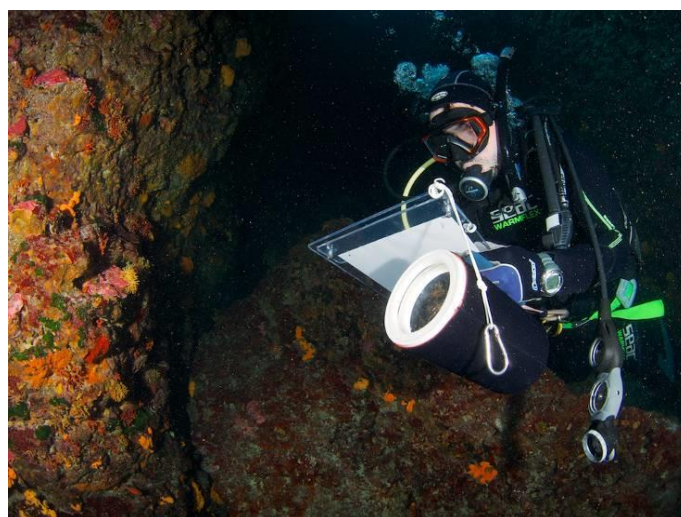


Figure 9: Diver estimating visually the percent spatial coverage of sessile biota in sites CS-1.

A second scientific diver was responsible for implementing the first steps of the rapid visual assessment (RVA) approach for the characterization of coralligenous outcrops (Gatti et al., 2015). RVA was not performed in CS-2 due to the small extent of coralligenous communities in this location and its proximity to CS-3. The species list presented in Table 4 includes *in situ* records by the two scientific divers.

Coverage results are presented in tables 5-8. Macroalgae dominated at all sites, with a mean coverage of 80.5%, while sessile animals had a mean coverage of 19.5%. Specifically, calcareous encrusting algae had a higher coverage at CS-1 and lower in CS-3 where erect algae (e.g. *Cystoseira* spp.) prevailed. Turf-forming algae dominated in CS-2. The highest coverage of sessile animals was found in CS-1 (27.5%). Porifera was the dominant animal phylum in all sites (12.5%) followed by Bryozoa (6.5%). Scleractinia presented a small coverage in all sites (0.4%).

Coralligenous communities in all sites were characterized by intermediate three-dimensional complexity; the majority of the recorded species belonged to the intermediate (1-10 cm height) and basal levels (1 cm height) according to the bionomic categorization of the RVA protocol (Gatti et al. 2015). Only one ascidian species (*Microcosmus sabatieri*) created an upper layer (>10 cm height) at CS-1. Five bio-eroding species were spotted in the three sites: the sponges *Cliona celata*, *C. viridis* and *C. schmidtii* and the bivalve molluscs *Lithophaga lithophaga* and *Rocellaria dubia*. The assessment of thickness and consistency of calcareous layer showed that penetration in CS-1 ranged between 0.4 and 1.2 cm and in CS-3 between 1.5 and 2.8 cm.

Table 5: Coverage of sessile biota for each segment of the transect at CS-1.

Taxa / Segment	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
Calcareous encrusting algae	10	60	50	10	40	40	35	30	5	0
Non-calcareous encrusting algae	0	20	10	50	20	20	15	15	5	5
Erect algae	30	0	0	0	0	0	0	0	10	70

Turf-forming algae	55	0	20	25	0	0	0	0	55	20
Encrusting sponges	3	0.5	3	2	5	10	5	25	10	5
Massive sponged	1	7	7	5	15	15	17	5	5	0
Scleractinia	0	0.5	0	0	2	0	3	0	0	0
Encrusting bryozoans	0.5	2	0	3	3	10	20	20	0	0
Erect bryozoans	0.5	10	10	5	15	5	5	5	10	0

Table 6: Coverage of sessile biota for each segment of the transect at CS-2.

Taxa / Segment	0-5	5-10	10-15	15-20
Calcareous encrusting algae	10	20	20	5
Non-calcareous encrusting algae	20	0	10	10
Erect algae	5	10	15	15
Turf-forming algae	40	60	45	60
Encrusting sponges	10	5	5	0
Massive sponges	5	5	5	0
Scleractinia	0	0	0	0
Encrusting bryozoans	5	0	0	5
Erect bryozoans	5	0	0	5

Table 7: Coverage of sessile biota for each segment of the transect at CS-3.

Taxa / Segment	0-5	5-10	10-15	15-20	20-25	25-30	30-35
Calcareous encrusting algae	5	5	5	10	20	0	10
Non-calcareous encrusting algae	5	10	10	10	10	0	20
Erect algae	20	40	40	25	10	30	20
Turf-forming algae	60	30	30	40	40	65	10
Encrusting sponges	5	10	10	5	5	0	0
Massive sponges	5	5	5	5	10	5	30
Scleractinia	0	0	0	0	0	0	5
Encrusting bryozoans	0	0	0	0	0	0	5
Erect bryozoans	0	0	0	5	5	0	0

Table 8: Mean coverage of sessile biota in the three sites.

Taxa / Site	CS-1	CS-2	CS-3	Mean
Calcareous encrusting algae	28	13.8	7.9	16.5
Non-calcareous encrusting algae	16	10	9.3	11.8
Erect algae	11	11.3	26.4	16.2

Turf-forming algae	17.5	51.3	39.3	36
Encrusting sponges	6.9	5	5	5.6
Massive sponges	7.7	3.8	9.3	6.9
Scleractinia	0.6	0	0.7	0.4
Encrusting bryozoans	5.9	2.5	0.7	3
Erect bryozoans	6.6	2.5	1.4	3.5
Macroalgae	72.5	86.3	82.9	80.5
Sessile animals	27.5	13.8	17.1	19.5

8. ACTIVITIES PROGRESS AND FUTURE PLANNING

Summary of activities progress of the present project in relation to CIGESMED work packages is provided in the following table.

NMPZ Activities	CIGESMED WP's	NMPZ PROGRESS
Activity 1 <i>Coralligenous assessment and monitoring</i>	WP2 - <i>Coralligenous assessment and threats in the different basins</i> WP3 - <i>Indicators' development and test</i>	Field survey and candidate site investigation, preliminary biodiversity assessment of coralligenous communities, development of easy methods for biodiversity and good health assessment, collaboration with national partners (HCMR) of CIGESMED project
Activity 2 <i>Management tools</i>	WP4 - <i>Innovative monitoring tools</i> WP6 - <i>Data management, mapping and assimilation tools</i>	Participation in monitoring tools design
Activity 3 <i>Participatory process- Promotion - Public awareness activities</i>	WP5 - <i>Citizen science network implementation</i> WP7 - <i>Outreach, dissemination and stakeholder engagement</i>	Close collaboration with HCMR

9. REFERENCES

Gatti G., Bianchi C. N., Morri C., Montefalcone M., Sartoretto S., 2015. Coralligenous reefs state along anthropized coasts: Application and validation of the COARSE index, based on a rapid visual assessment (RVA) approach. *Ecological Indicators* 52: 567–576.

10. APPENDIX

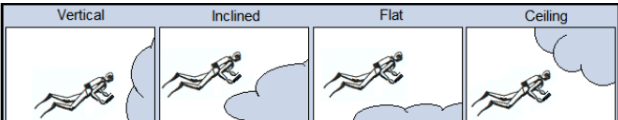
Biotic Cover Protocol

[illegible]

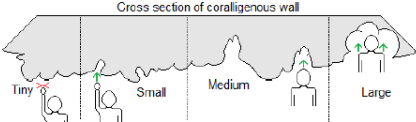
Habitat Mapping Protocol

GPS start						GPS end				Ημερομηνία	
Τμήμα (m)	Προσαν (μοίρες)	Κλίση				Ανωμαλία εδάφους				Σκουπίδια Υλικό	Παρατηρήσεις
		F	I ~45°	V	C	T	S	M	L		
0-5											
5-10											
10-15											
15-20											
20-25											
25-30											
30-35											
35-40											
40-45											
45-50											
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65-70											
70-75											
75-80											
80-85											
85-90											
90-95											
95-100											

Vertical Inclined Flat Ceiling



Cross section of coralligenous wall



Rapid Visual Assessment (RVA) Protocol

[illegible]

Selected field work photos (by T. Dailianis, M. Sini, K. Vatikiotis, C. Katsoupis, C. Arvanitidis, V. Gerovasileiou)





