# CIGESMED

## Implementation of coralligenous habitats characterization protocols for the effective evaluation of the good environmental status of the Mediterranean Sea

# Study of coralligenous habitats by means of photo-quadrats: the intercalibration work

Thierry de Ville d'Avray L.*, David R.*, Guillemain D.*, and Féral J.-P. *, with contributors**

## Objective: study the assemblage of species in coralligenous habitats

The photo-quadrats enable measurement of metrics such as:

- Occurrences
- Abundance
- Cover rates
- Dominance
- Size of individuals
- Size of populations
- Fractionation of the cover

## Intercalibration principle

Metrics variability depends on natural conditions, but the measurement of the metrics depends on methods and tools. Variability of these parameters must be tested in order to understand the metrics variability due to the protocol. Moreover, as a program of operational research, CIGESMED intends to propose protocols that are feasible at a lower cost. They must be doable in all the involved countries, whatever their coralligenous profiles, and should be implementable by scientists as well as managers.

## Perspective: contextualization

Photo-quadrats will then be analysed regarding their profile type, thanks to the cartography work.
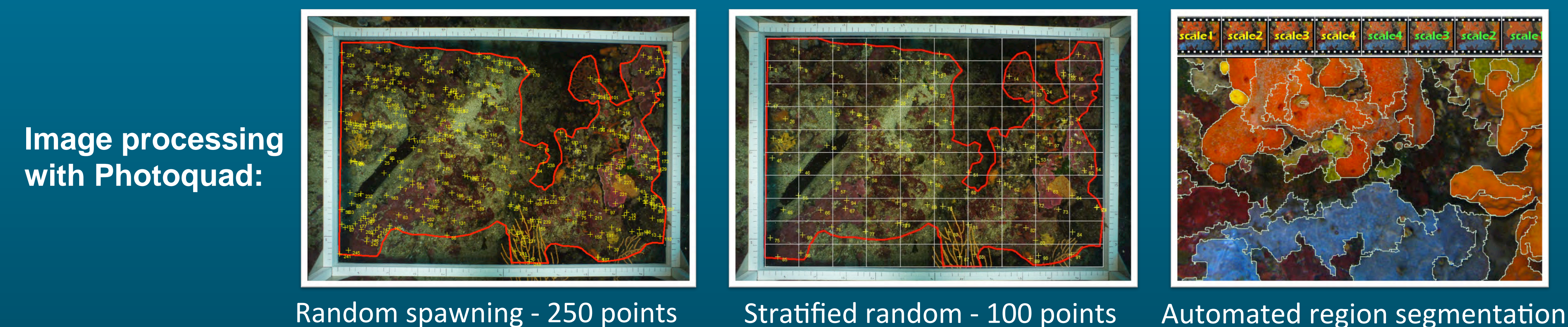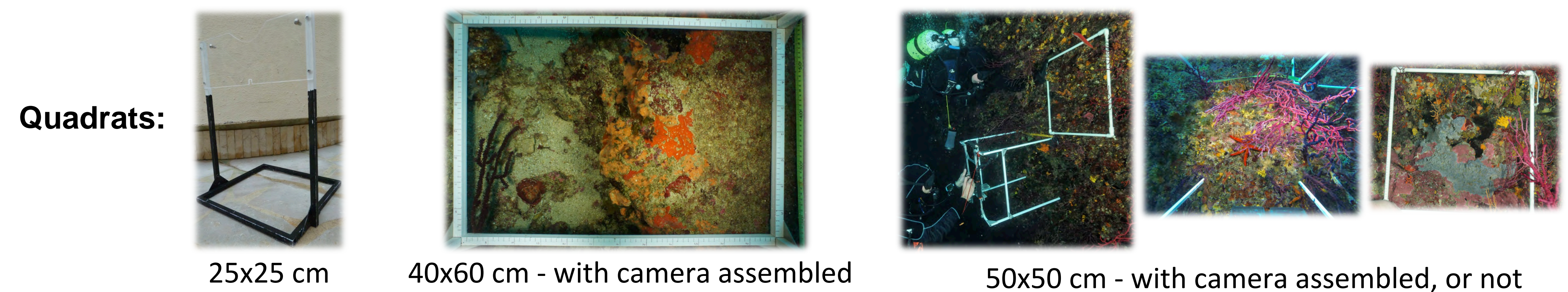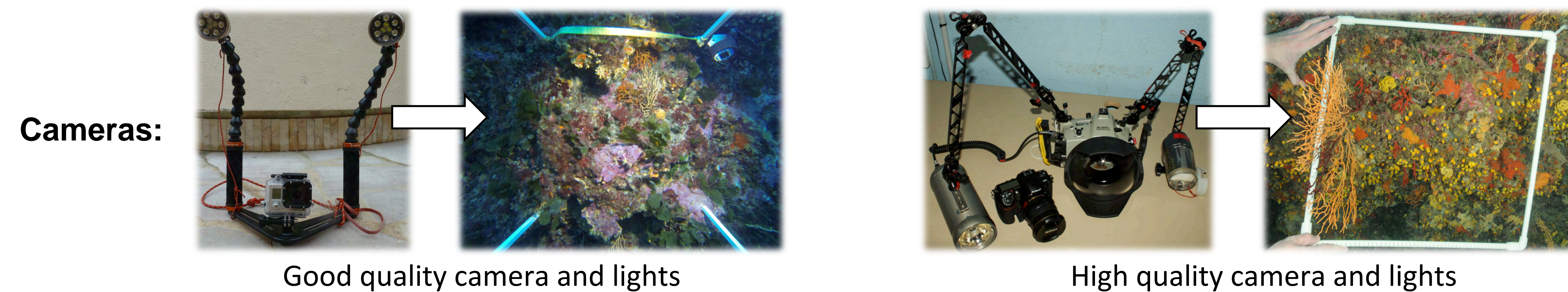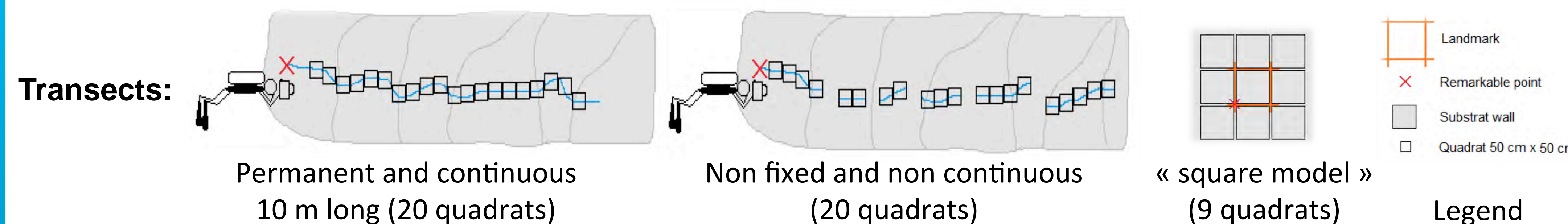
## Coralligenous habitats

They are endemic Mediterranean habitats mainly made of sciaphilous coralline algae with complex structure. This bioherm enables the development of several types of communities including gorgonians or red coral (*Corallium rubrum*). (Laborel, 1961 ; Laubier 1966).

## CIGESMED program (2013-2016)

CIGESMED program is linked to the MSFD (Marine Strategy Framework Directive): descriptors D1 biodiversity, D2 alien species and D6 bottom integrity. It's an international program which aims to create a monitoring network of coralligenous habitats in order to evaluate the Good Environmental Status

## Intercalibration work: methods tested

Measurements of metrics depend on the protocol applied, the equipment used, the image processing method and the observer/operator practise. Estimation of the variability induced by the choice of a particular method or equipment shall allow a better understanding of the efficiency of each experimental combination.

**Transects:**



Permanent and continuous 10 m long (20 quadrats)

Non fixed and non continuous (20 quadrats)

« square model » (9 quadrats)

Legend:
- Landmark
- Remarkable point
- Substrat wall
- Quadrat 50 cm x 50 cm

**Cameras:**



Good quality camera and lights

High quality camera and lights

**Quadrats:**



25x25 cm

40x60 cm - with camera assembled

50x50 cm - with camera assembled, or not

**Image processing with Photoquad:**



Random spawning - 250 points

Stratified random - 100 points

Automated region segmentation

**Operators:** 3 persons of different level of knowledge in coralligenous species have treated the same dataset of 20 photo-quadrats made on a permanent and continuous transect in the site « Tiboulen du Frioul », with the software Photoquad, using the 100 points- stratified random spawning method.

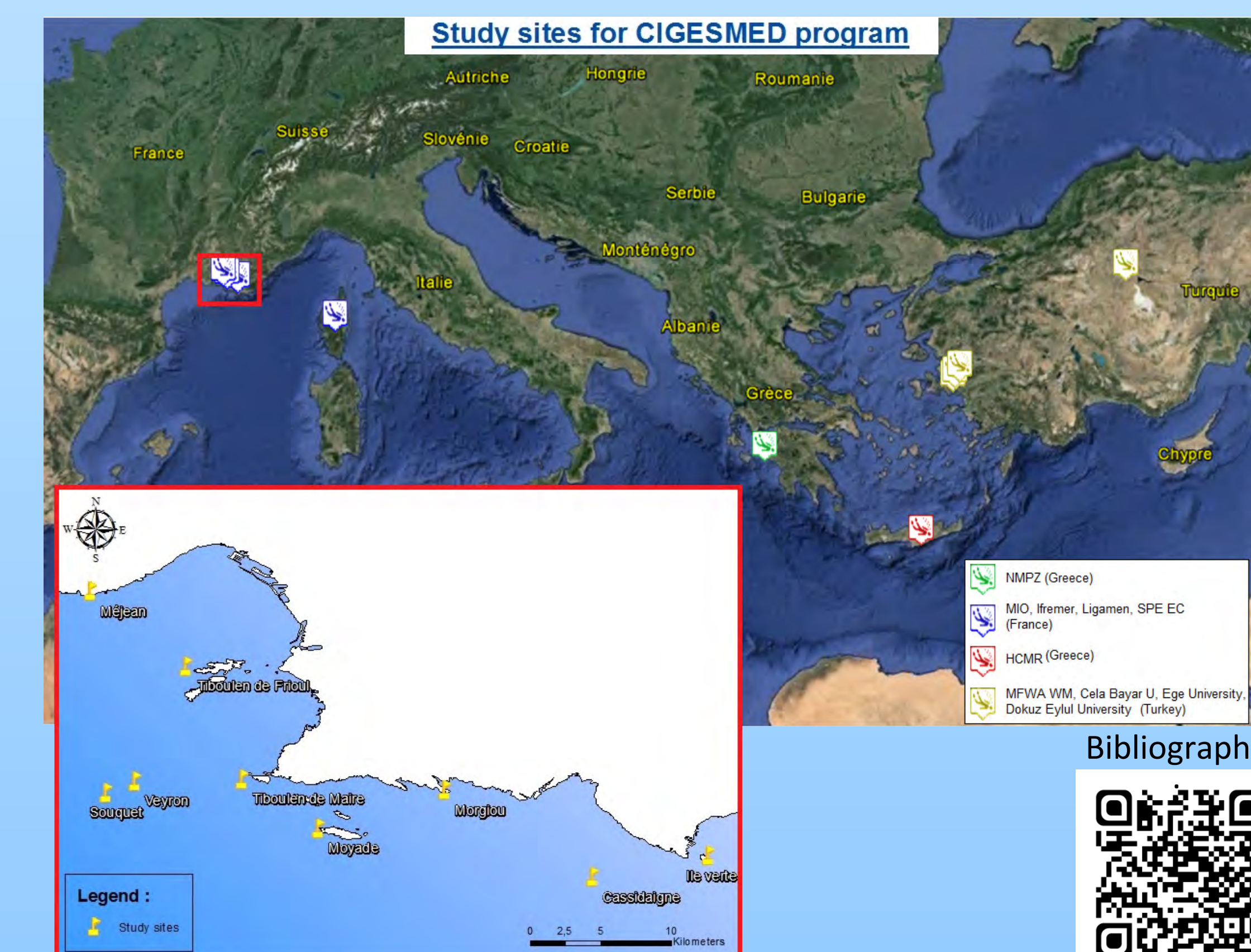## Preliminary results: operators' intercalibration

### Level of identification of coralligenous species
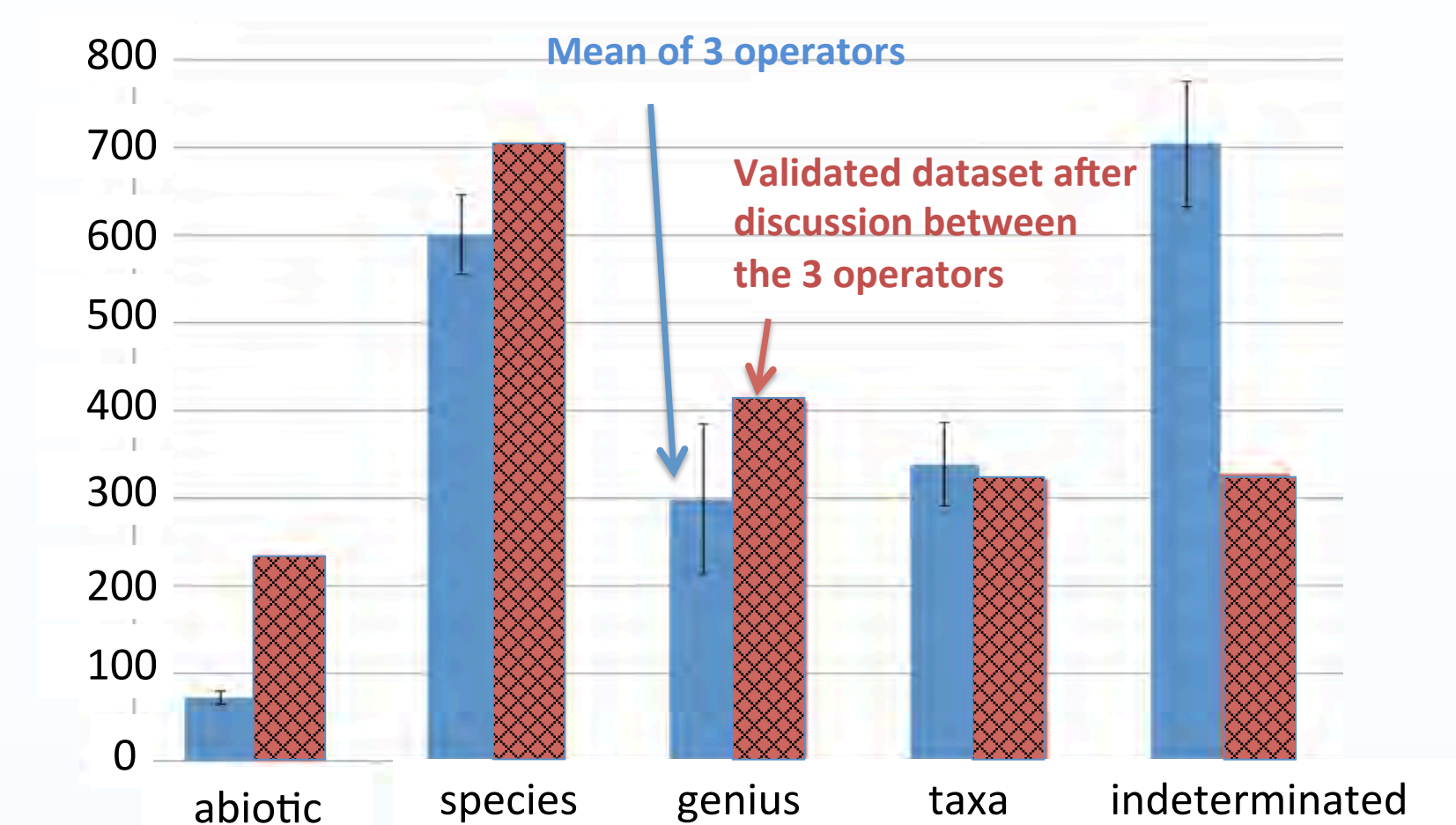


### Proportion of species identified per taxa by 3 operators
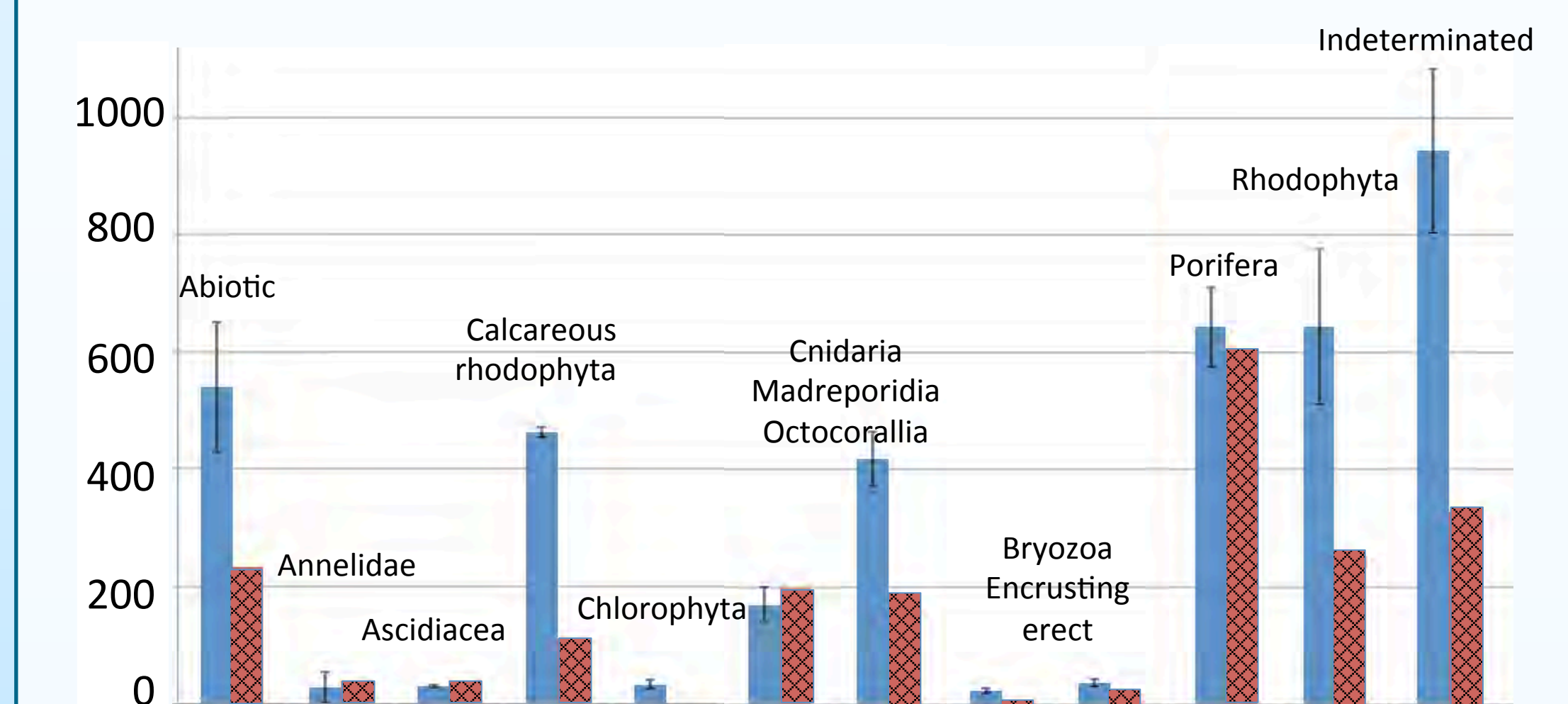


The results validated by the 3 operators show a significant decrease of the indeterminate category. Identification level is generally good (species or genus level). The standard error should become acceptable. The main phylums observed are: Rhodophyta, Porifera, Cnidaria. *Statistically tests are in progress.*

### Study sites for CIGESMED program



Legend: Study sites

NMPZ (Greece)
MIO, Ifremer, Ligamen, SPE EC (France)
HCMR (Greece)
MFWA WM, Cela Bayar U. Ege University, Dokuz Eylül University (Turkey)

Bibliography

imbe

Institut Pythéas
Observatoire des Sciences de l'Univers
Aix-Marseille Université