

# A study of *Electra posidoniae* Gautier, a bryozoan strictly found as epiphyte of the seagrass *Posidonia oceanica* (L.) Delile.

Gilles Lepoint<sup>1</sup>, Olivier Mouchette<sup>1</sup>, Corine Prélapat<sup>2</sup>, Sylvie Gobert<sup>1</sup>

<sup>1</sup>Laboratoire d'Océanologie, Centre MARE, Université de Liège

<sup>2</sup>Stareso S.A., Station de Recherche Sous marine et océanographique, Calvi, Corse

## Introduction:

\*Seagrass epiphytes have often important role in ecosystem functioning, such as food web suppliers,  
\*Some species (such as the bryozoa *Electra posidoniae* Gautier) (**Fig.1**) are specialised in the colonization of plant substrate and often dominate epiphytic community of long life-span seagrasses such as *Posidonia oceanica* (L.) Delile,  
\*Because epiphytic compartment dysfunction is often implied in human-induced seagrass decline, it is important to understand dynamics and life traits of its specific component in pristine area.

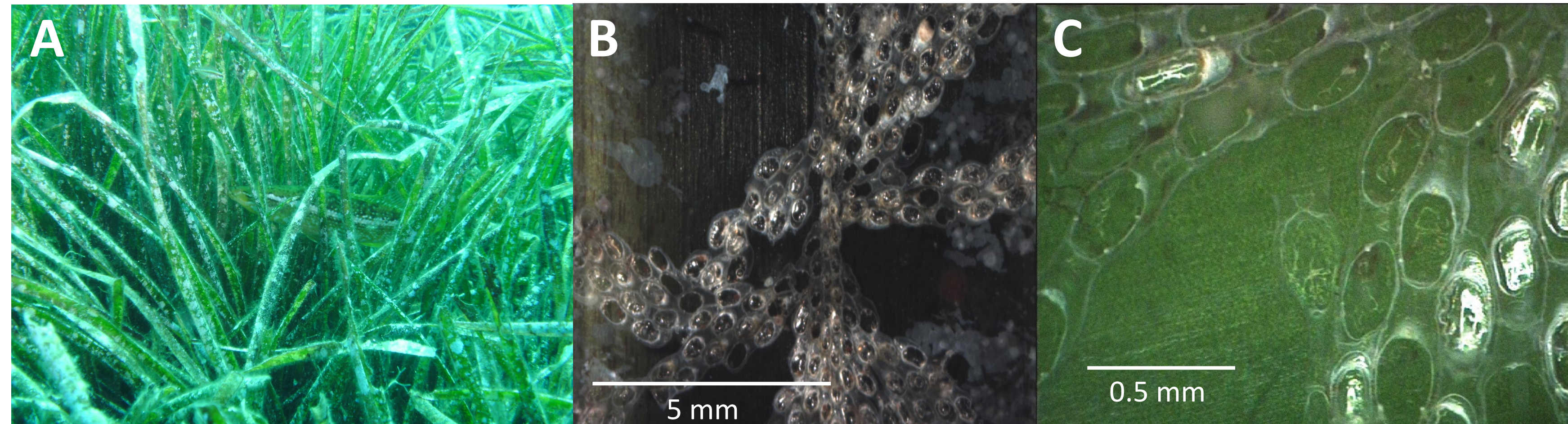


Figure 1: A. The seagrass *Posidonia oceanica* (L.) Delile and its epiphytic community; B. a colony of the bryozoans *Electra posidoniae* Gautier on *P. oceanica* leaf, C: *E. posidoniae* colony (zoom).

**Aim:** In our study, colonization patterns, biomass, carbon stable isotope composition of *E. posidoniae* (**Fig. 1**), a species strictly found on the leaves of the seagrass *P. oceanica*, were assessed monthly at 10 metre depth in the Revellata Bay (Calvi, Corsica, Mediterranean sea).

## Results I:

- P. oceanica* leaves, their algae epiphytes and *E. posidoniae* shown seasonal growth and decay (**Fig. 2**),
- E. posidoniae* is almost absent in winter,
- E. posidoniae* is a early spring species, with a biomass maximum in May,
- Epiphytic algae continued to develop in summer, till leaf abscission,
- Contribution of *E. posidoniae* to epiphytic biomass and to total above ground biomass varied between 0.5 and 48% and, between 0.1 and 10%, respectively.

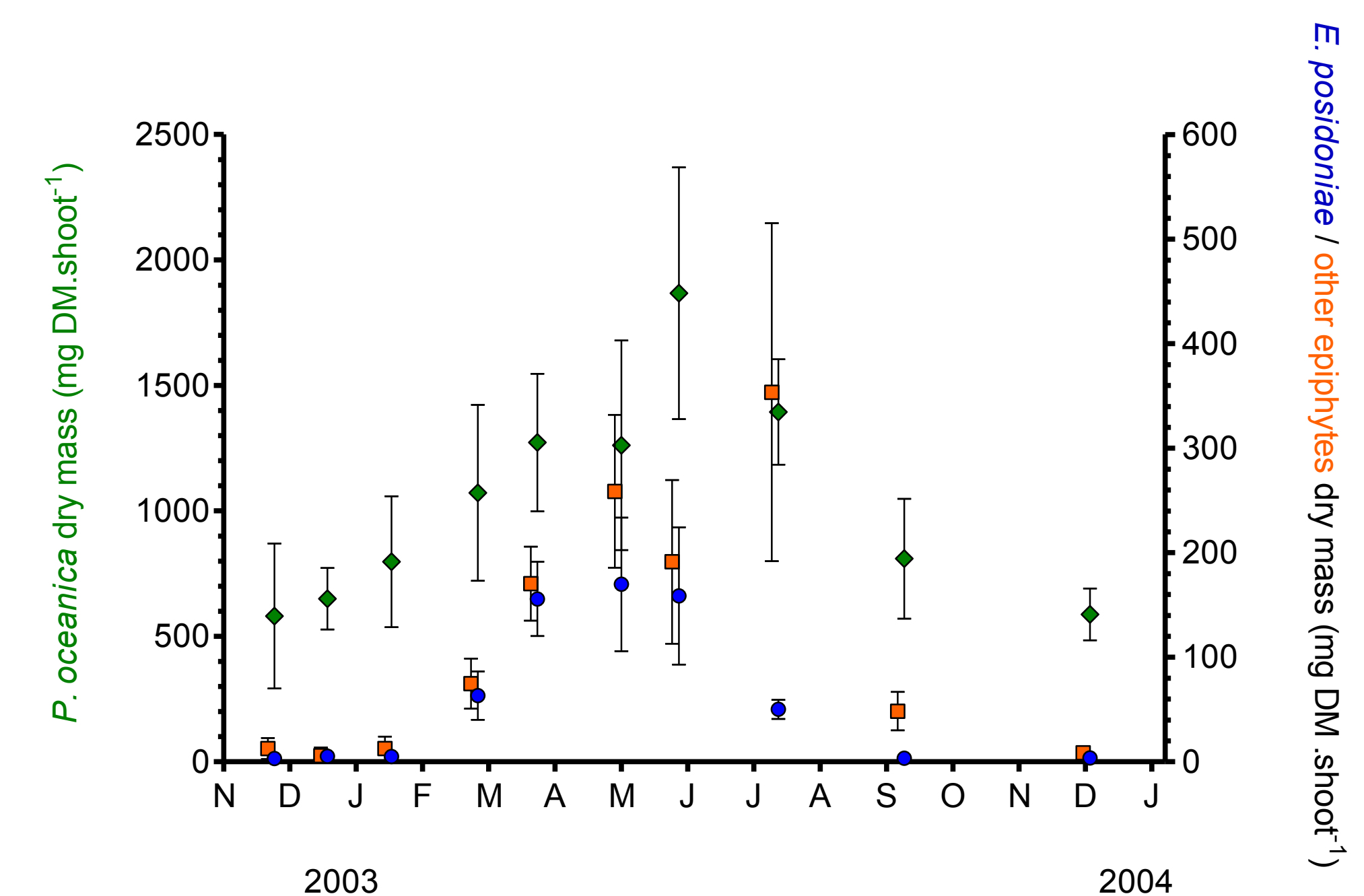


Figure 2: Dry mass per shoot of *P. oceanica* leaves, total epiphytes and of *E. posidoniae* at 10 m depth from November 2002 to December 2003 in the Revellata Bay (Calvi, Corsica, Mediterranean Sea)

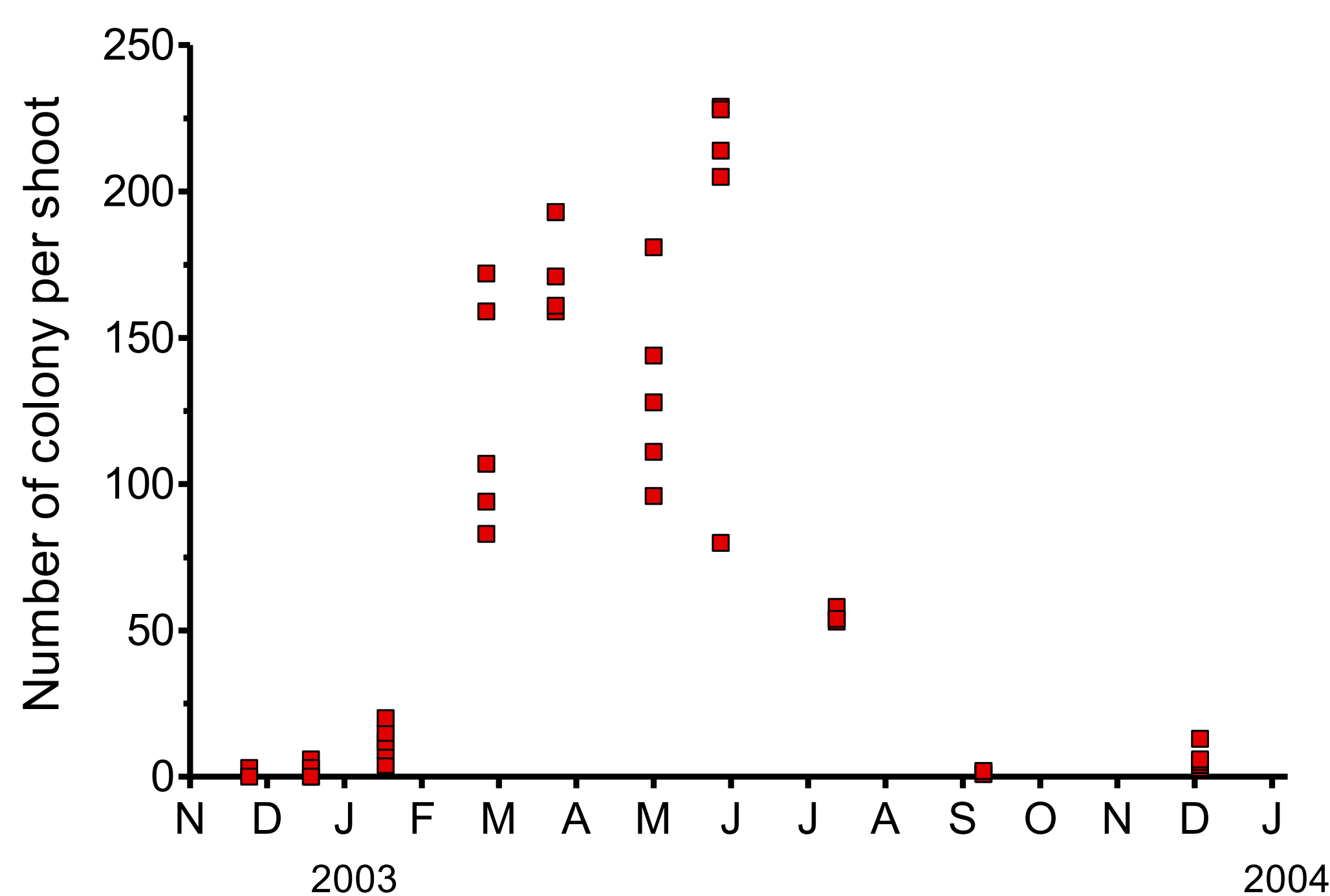


Figure 3: Number of *E. posidoniae* colony by shoot of *P. oceanica* at 10 m depth from November 2002 to December 2003 in the Revellata Bay (Calvi, Corsica, Mediterranean Sea) .

## Results II:

- Larvae and Colonies were mostly settled on the internal face of *P. oceanica* leaves (not shown)  
→ WHY (Functional hypothesis vs Competition hypothesis) and HOW (larval chemotaxy?) ?
- Recruitment occurs between February and June, leaving a 6 month gap without significant colonization  
→ WHICH REPRODUCTIVE STRATEGY?,
- Maximum colony number (229 per shoot) corresponded to more than 100,000 colonies per m<sup>2</sup> at 10 m depth in the *P. oceanica* meadow of the Revellata Bay  
→ WHICH IMPORTANCE FOR BENTHIC-PELAGIC COUPLING?

## Results III:

- In March and April, composition of carbon stable isotopes of *E. posidoniae*, expressed by delta <sup>13</sup>C, was closed to the delta <sup>13</sup>C of water column phytoplankton  
→ MAJOR CONTRIBUTION OF WATER COLUMN TO *E. POSIDONIAE* DIET
- Nevertheless, at the end of phytoplankton bloom, these values tended to increase to less negative values  
→ CONTRIBUTION OF OTHER SOURCES? (epiphytic microflora and/or *P. oceanica* detritic material)

C/N ratios (w:w) tends to increase in July (increase of lipid reserves or decrease of food quality ?)

→ RELATION TO REPRODUCTION PERIOD LARVAL SUPPLY?

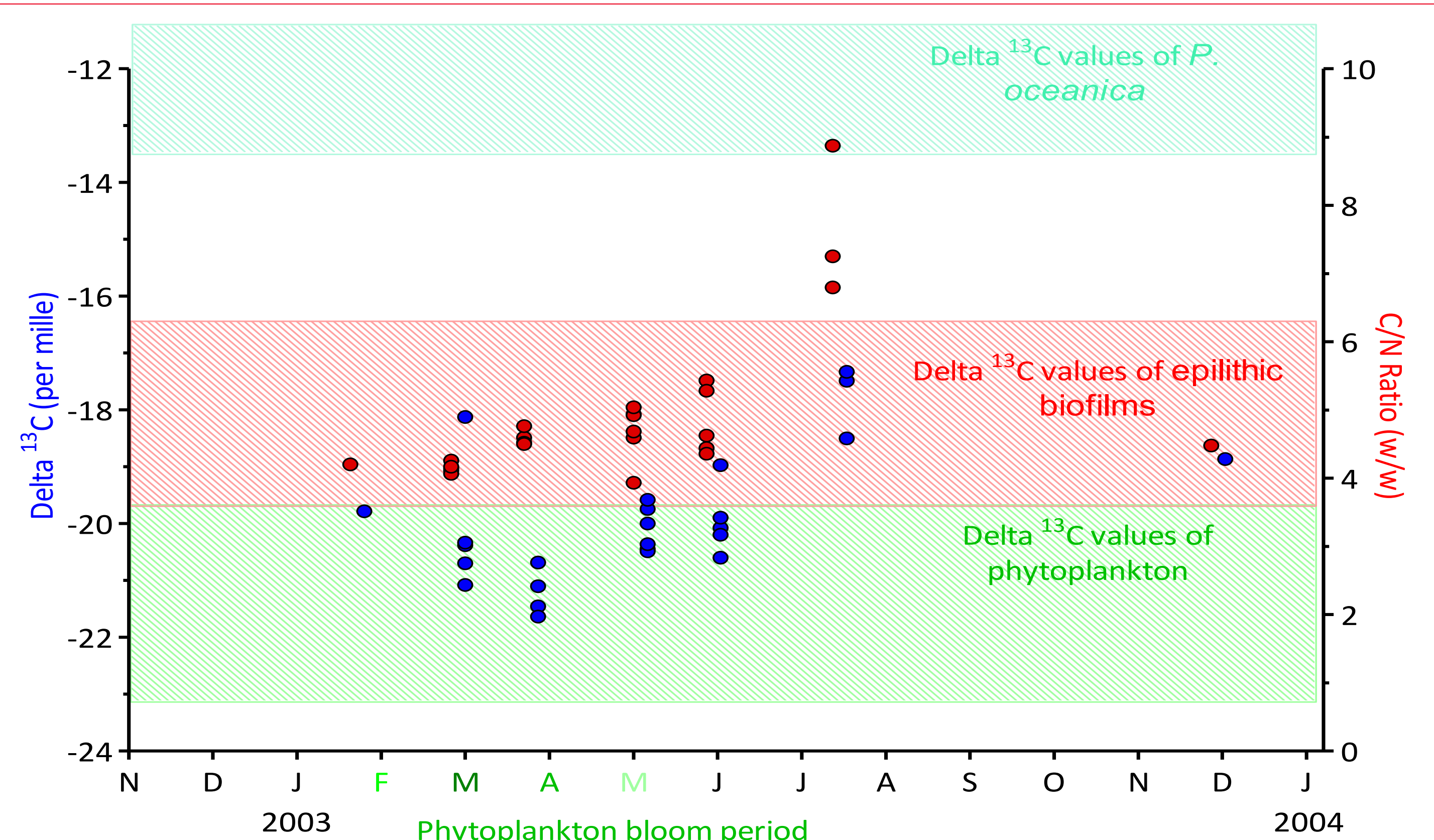


Figure 4: Elemental and stable isotope compositions of *E. posidoniae* according to sampling time, measured using EA-IRMS (VarioMicro-Isoprime 100, Elementar). Colonies of one shoot were pooled to make measurements. Delta <sup>13</sup>C values were obtained on decalcified samples. Range for phytoplankton and for *P. oceanica* from Lepoint *et al.*, 2000, Mar. Biol. and Lepoint *et al.*, 2003, Bot.Mar. Range for biofilm grown on artificial substrate: Vermeulen 2012, PhD thesis.

## Take home message:

- The bryozoa *Electra posidoniae* is a early spring colonizer of *P. oceanica*, both in relation to seasonal seagrass growth and to phytoplankton occurrence,
- This animal species contributes significantly to epiphytic biomass and, probably, to pelagic-benthic coupling in this system,
- Preliminary results using stable isotopes of carbon could indicate alternative food sources during post-bloom.



