Answer to the general comments:

We thank the reviewer for the positive assessment acknowledging the research reported as original and interesting. We also thank the reviewer for the comments and suggestions for improvements, which will help produce a much improved revised version of the manuscript. We will improve the manuscript following the constructive reviews and adding the references proposed (see specific actions below).

We agree that the discussion on the impact of TEP production by *P. oceanica* at the scale of the Mediterranean suffers from a number of limitations, including a number of uncertainties around the TEP production at the basin scale, which derive from uncertainties in the components of such estimate. We will address these limitations and will, on the light of these limitations, tone down the claims at the scale of the Mediterranean. We will also revise the text to improve clarity.

This text will be changed in the revised version to:

"These observations suggest that *P. oceanica* meadows, the dominant ecosystem in Mediterranean coastal waters, are an important source of TEP precursors in the Mediterranean Sea. Considering the average leaf production of *P. oceanica* of 876 g DW m^{-2} y^{-1} (Duarte and Chiscano, 1999), the estimated 37,000 Km^2 covered by *P. oceanica* in the Mediterranean Sea (range 31,040 to 43,550 Km^2, Marbà et al. 2014), and the average TEP yield from leaf litter experimentally derived here (2344 µg C g DW^{-1}) we calculated that *P. oceanica* releases about 76 Gg C as TEP annually to the Mediterranean Sea. However, this estimate should be considered a first-order estimate, as it involves considerable uncertainty, compounding that derived from the substantial variability in primary production of *P. oceanica* (Duarte and Chiscano, 1999), that in the area covered by *P. oceanica* meadows in the Mediterranean Sea, and variability in TEP yield across meadows and over time, as the estimate used was derived from a single meadow in the fall. Improving this estimate will require narrowing down these sources of uncertainty as well as the capacity to compare it with estimates of other sources of TEP, such as phytoplankton, which are not yet available at the basin scale. The contribution of *P. oceanica* meadows to TEP release may contribute to explain, along with other processes, the elevated TEP/Chl *a* ratios characteristic of the Mediterranean Sea (Ortega et al., 2010). The role of *P. oceanica* as a relevant source of TEP precursors is enhanced by the contrast between the high production of *P. oceanica* meadows (Duarte and Chiscano, 1999), resulting in a high production of detritus (e.g. Mateo and Romero, 1997; Cebrián and Duarte, 2001) releasing TEP precursors, and the oligotrophic nature of the Mediterranean Sea, leading to low production in the pelagic compartment. In fact, both *P. oceanica* (e.g. Alcoverro et al., 1997) and phytoplankton (e.g. Krom et al. 1991) are likely to be strongly nutrient-limited in the Mediterranean Sea, which has been shown to enhance the release of TEP precursors through carbon overflow during nutrient limiting conditions (Mari et al., 2001; Radić et al., 2005).
Despite the limitations acknowledge above, our estimates highlight the important role of *P. oceanica* litter as source of TEP in the Mediterranean, and suggest that seagrass meadows may play a similarly important role in other regions supporting extensive seagrass meadows, such as the Caribbean, Australia and South East Asia.

We provide below, our response to the specific comments:

We agree that the estimate of the TEP production of 0.10 Tg C y^{-1} we propose involve significant uncertainties, which should be acknowledged, and represent, therefore, a first-order estimate. We will acknowledge and discuss these limitations in the revised version of the manuscript (see above).
We agree that the area covered involves uncertainties, and now report the range of the most robust assessment to date (range 31,040 to 43,550 Km^2, Marbà et al. 2014). We will revise the estimate of TEP production, accordingly, downwards to 76 Gg C y^{-1} (compared to 0.1 Tg C reported originally), and acknowledge that this is a first-order estimate with substantial uncertainty.
We will also acknowledge that the yield of TEP may be variable across meadows and over time, and that these variability need be considered (see above).
The production reported above of 876 g DW m^{-2} y^{-1} (Duarte and Chiscano, 1999), is indeed leaf production, and is a more thorough estimate, the average of 17 estimates, than those provided in Pergent et al. (1994, 1997). We also acknowledge that this estimate carries significant uncertainty (reported in Duarte and Chiscano, 1999).
Line 123-125: We will acknowledge that the leaf litter of *P. oceanica* supports a complex community of heterotrophic microbes that may contribute to TEP release. The text will be revised to read: "The experimental evidence reported further confirms the role of TEP formed by precursors released by *P. oceanica* leaf litter, together with the associated microbial heterotrophic community (Peduzzi et al. 1991), in explaining the differences between the two sites, as the TEP concentration reached, using a concentration of leaf litter similar to that observed in Es Caragol, is comparable to the maximum values observed *in situ*."

Answer to the technical corrections:
Line 35: We agree, in the new version of the manuscript we deleted the reference of Thingstad and Rassoulzadegan (1999).

Line 33-40: We agree and the text has been modified accordingly (see above).

Line 41: We agree, the new version of the manuscript will be corrected from "study" to "studying".

The following references will be included in the revised manuscript:

Alcoverro, T., Romero, J., Duarte, C. M. and López, N. I.: Spatial and temporal variations in nutrient limitation of seagrass *Posidonia oceanica* growth in the NW Mediterranean, Mar. Ecol. Prog. Ser., 146, 155–161, 1997.

Cebrián, J. and Duarte, C. M.: Detrital stocks and dynamics of the seagrass *Posidonia oceanica* (L.) Delile in the Spanish Mediterranean, Aquat. Bot., 70, 295–309, doi:10.1016/S0304-3770(01)00154-1, 2001.

Krom, M. D., Kress, N., Brenner, S. and Gordon, L. I.: Phosphorus limitation of primary productivity in the eastern Mediterranean Sea, Limnol. Oceanogr., 36(3), 424–432, 1991.

Marbà, N., Díaz-Almela, E. and Duarte, C. M.: Mediterranean seagrass (*Posidonia*

oceanica) loss between 1842 and 2009, Biol. Conserv., 176, 183–190, doi:10.1016/j.biocon.2014.05.024, 2014.

Mateo, M. A. and Romero, J.: Detritus dynamics in the seagrass *Posidonia oceanica*: elements for an ecosystem carbon and nutrient budget, Mar. Ecol. Prog. Ser., 151, 43–53, 1997.

Peduzzi, P. and Herndl, G. J.: Decomposition and significance of seagrass leaf litter (*Cymodocea nodosa*) for the microbial food web in coastal waters (Gulf of Trieste, Northern Adriatic Sea), Mar. Ecol. Prog. Ser., 71, 163–174, 1991.