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Biogeosciences Discussions

Interactive comment on "The strength of the biotic compartment to retain nitrogen additions prevents nitrogen losses from a Mediterranean maquis" *by* T. Dias et al.

Anonymous Referee #1

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Review of the research article:

The strength of the biotic compartment to retain nitrogen additions prevents nitrogen losses from a Mediterranean maquis.

T. Dias1, M. A. Martins-Loucão1, L. Sheppard2, and C. Cruz1

General comment: The effect of atmospheric nitrogen deposition on Mediterranean ecosystems remains a topic of interest as they remain as under-investigated ecosystems in this regard. So this article provides new data that are extremely interesting and fit perfectly with the scope of the journal Biogeosciences.

However, I suggest a series of minor corrections before publication.

Main points:

Introduction: It is not clear to me what the term "ecosystem asynchronous" means because I can see in the data that the situation under control conditions, or natural conditions with no N addition, there is no an increase in the availability of soil N in autumn. This only happens in the case of N addition. Perhaps the authors should better explain the meaning of the term since any reference is included with regard to this topic.

Experimental design and fertilization schedule: Between lines 5 and 15 there seems to be some confusion regarding the time at which the first addition of N occurs. On one hand, it seems that it took place in January, but then the authors state that three applications were made equal in spring, summer and autumn, which is unclear. From Figure 1, it appears that there were 4 applications but this is not clearly reflected in the text. I suppose that four applications were made and this must be clarified in the text.

Calculations: In the formula given to calculate changes over time, it is unclear to me why the denominator is divided by 2. This should be explained better.

Results.

Soil responses to N additions: There are differences in the explanations with regard to the moments at which soil sampling took place. (the end of October in the text, whereas, in Figure 1a, the asterisk marks the beginning of October and in figures 1b, 1c and 1d, it is mentioned as in November 2007. The authors must clarify this point since the beginning of the rains may have a great influence on the N washing. It is very important to know whether the autumn sampling took place before or after the start of the rains.

Cistus ladanifer responses to N additions: Again, here it is not clear to me whether the experiment started in January 2007 or in spring 2007. This must be clarified.

Conclusions.

Under my point of view, there is at least one question that must be clarified in relation to part of the main conclusions of this work. The authors argue that “the results of this study suggest that most of the added inorganic N was retained in this N-limited Mediterranean maquis, affecting its structure and function”. But later on, the authors explain that the N added was retained in the biotic compartment during the growing season, and returned to the soil after the dry period after the decomposition of litter in the fall. To me, the litter cannot be considered as a compartment for retention of nitrogen in the N-cycle, but a temporary place until the mineralization occurs in the fall. This N that comes from litter mineralization is surely washed out from soil after the first raining in the fall, and therefore not retained in the system.

This divergence of opinion must be answered before the paper is accepted for publication.

Other comments.

Fig. 2: The foot text of this figure must have the explanations for both graphs a) and b).

Fig. 4: This Figure needs the same revision than Fig 2.

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