Constance Choquel behalf on all the authors.

constance.choquel@gmail.com

Dear Referee,

Thank you for your constructive comment and your interest in our work. We agree with the majority of the suggestions that you bring to our study. The status of *Nonionella* sp T1 remains unclear. We are to follow the recommendations made by V. Bouchet by introducing *Nonionella* sp. T1 as Non-Indigenous Species then, in discussion we will discuss its invasiveness in Gullmar Fjord. Indeed, the dominance of *Nonionella* sp. T1 could be harmful for the foraminifera diversity. I am aware that this study must be followed by a long bio-monitoring > 63 µm (seasonal, different depths stations) to validate the ongoing change in Gullmar Fjord fauna.

Question 1: The title of the study implies, that the work focuses on total nitrate uptake of a specific benthic foraminifer. However, the emphasis of the first part in the discussion of this study implies a thorough taxonomic investigation of the Fjord fauna, which is not the case in this study. I agree with the authors, that there is an ongoing change in the benthic foraminiferal community of the Gullmar Fjord. But to verify this trend and to discuss its consequences, a longer-term monitoring study observing seasonal fluctuations of the benthic foraminiferal community together with environmental parameters at several stations within the fjord is necessary. Further, a more detailed comparison with previous literature would be necessary. I think the authors should point out, that such monitoring studies (including the 63 – 125µm size fraction) are important for the future, specifically considering the new observations of this study.

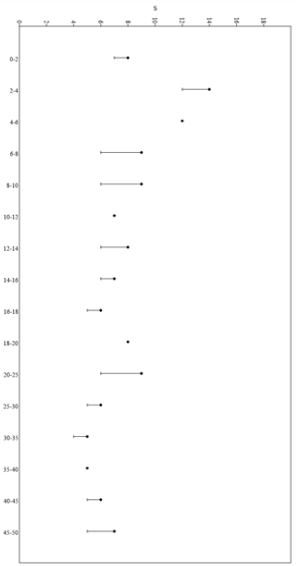
Answer 1: We agree that a long monitoring would be necessary to validate the change in fauna and include a study with a smaller fraction.

Question 2: I agree with the author of the short comment considering the invasive status of *Nonionella* sp. T1. Certainly, this species is proven to be non-indigenous. However, the actual invasive status of this species is not proven yet. It is not yet clear, if the occurrence of Nonionella sp. T1 is responsible for the disappearance of any other species in the Fjord, nor is there any evidence, that this species is harmful for the ecosystem of the Gullmar Fjord. On the contrary, the authors point out, that this species might even be of advantage for the trophic status of the fjord. It is important to stick with correct ecological terminology to avoid confusion in further research. I would recommend to change the term ‘invasive’ to ‘non-indigenous’.

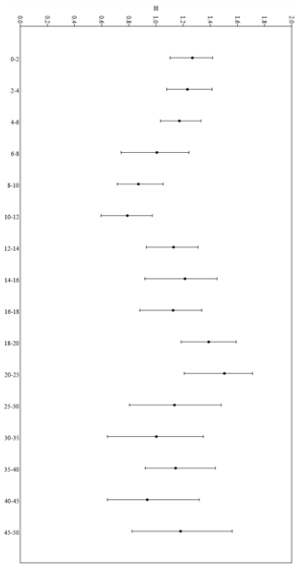
Answer 2: We agree with V. Bouchet comment. I will introduce *Nonionella* sp. T1 as a Non-Indigenous Species (Deldick et al., 2019). Then, in the discussion We will mention the invasive character of this species in the Gullmar Fjord in view of its strong increase in density at the entrance to the Fjord. There is no evidence yet that *Nonionella* sp. T1 can harm the ecosystem, however *Nonionella* sp. T1 could affect the fauna of foraminifera. Indeed, the specific richness (S) and the Shannon index (H) decrease with sediment depth sediment in the GF17-3 station while the dominance (D) due to *Nonionella* sp. T1 increases (see graphs GF17-3A and 3C). In the hypoxic station (GF17-1), the dominance is driven by *Cassidulina laevigata* and *Bulimina marginata* which dominated the fauna.

GF17-1A

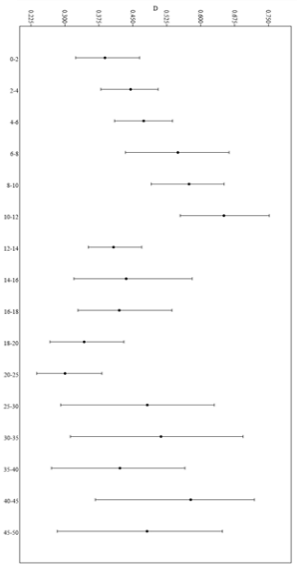
Specific richness



Shannon Index

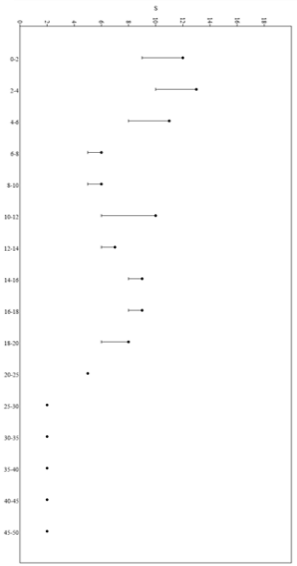


Dominance

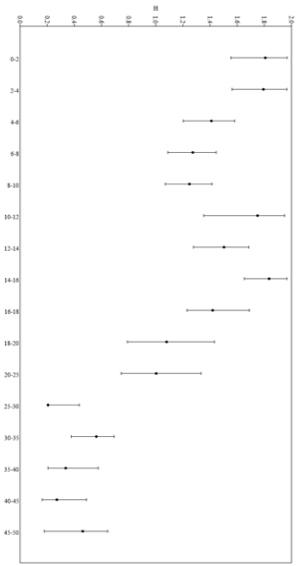


GF17-1C

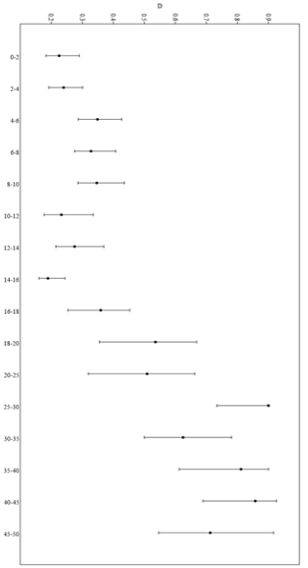
Specific richness



Shannon Index

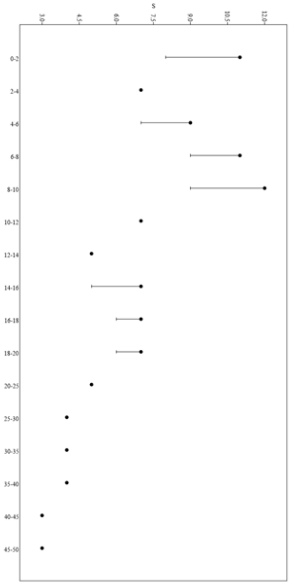


Dominance

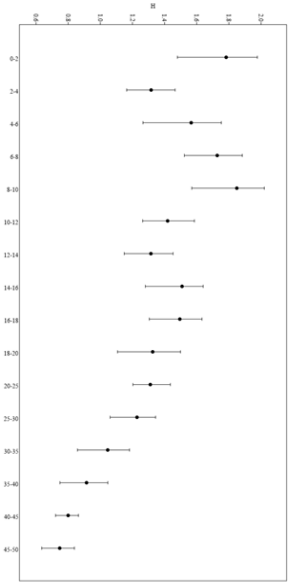


GF17-3A

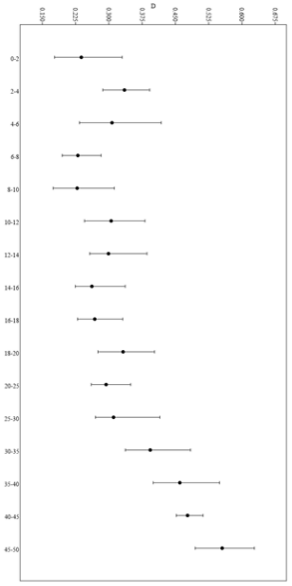
Specific richness



Shannon Index

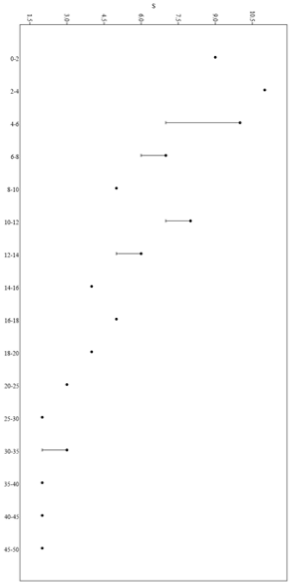


Dominance

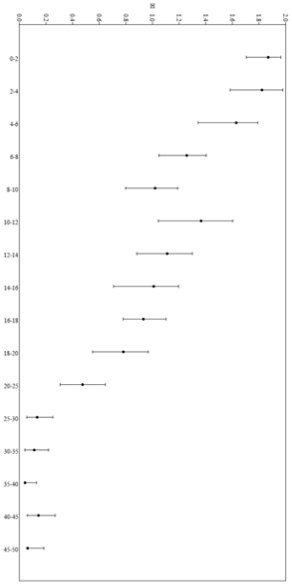


GF17-3C

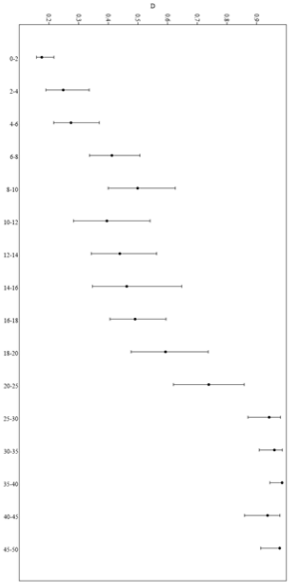
Specific richness



Shannon Index



Dominance



Additionally, I would like to add a few technical corrections and minor remarks:
Introduction:
Question 3: Line 29: 'and thereby to survive' should be 'and thereby survive'
Answer 3: ok

Question 4: Line 32: 'This study focus on...' should be 'This study focuses on...'
Answer 4: Ok

Material and Methods:
Question 5: Line 127: 'Fixed samples were sieved and the > 100 m fraction was examined...' Did you remove any larger meiofauna e.g. by sieving through a larger sieve (5 mm, 2 mm, 1mm)? If so, this should be mentioned too, since adults of larger denitrifying genera e.g. *Globobulimina* often cannot pass through a 1 mm sieve.

Answer 5: the sieves used are

>355	355-150	150-125	125-100

No 1 mm sieve was used there should be no loss of *Globobulimina*.

Discussion:
Question 6: Line 292: I would consider to change the title of this section into something like: 'Abundance of Nonionella sp. T1 in comparison with other species'

Answer 6: yes we will change the title to be more careful about the change of fauna.

Question 7: Line 315: I think there is something a little bit wrong with this sentence. Should it be something like: 'That the foraminiferal fauna described in the present study differs, is the consequence...'
Answer 7: We will rewrite this sentence.

Question 8: Line 327: Did Polodova Asteman and Schönfeld (2015) sample the same location at the oxic part of the fjord?

Answer 8: No, they sampled in the deep Alsbäck station which was oxic at the time of the sampling in August 2013 and July 2014. They sampled a station in the Skagerrak near the mouth of the fjord in June 2013, we compared my oxic station with this data out of the fjord.

Question 9: Line 359: Could propagules also be a reason for the survival or re-appearance of the non-denitrifying species in the hypoxic part of the fjord?

Answer 9 : Yes, propagules can disperse and reproduce when environmental conditions are favourable (Alve and Goldstein, 2003). However, there is no change in density of *Nonionella* sp. T1 at the Alsbäck station from the densities found by Polovodova Asteman and Schönfeld (2015). It would be interesting to look again at this Alsbäck station to see if there is an evolution of the densities of *Nonionella* sp. T1 and if there is a seasonality of denitrifying foraminifera depending on the oxygenation conditions (hypoxic vs oxic).

Question 10: Line 392: I would be careful with this consideration, because other well oxygenated areas of the Fjord might be dominated by other species - depending on depth or other environmental parameters.

Answer 10: Yes to test this hypothesis it would be necessary to sample several oxic stations at different depths in the fjord.

Question 11: Figure 6: It should be 'Depth (mm)' for GF17-3A and 3C and GF17-1A and 1C and not Depth (cm).

Answer 11: ok