

***Interactive comment on “Influence of elevated CO<sub>2</sub> concentrations on cell division and nitrogen fixation rates in the bloom-forming cyanobacterium *Nodularia spumigena*” by J. Czerny et al.***

**Anonymous Referee #1**

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This is a very nice manuscript reporting on the impacts of elevated CO<sub>2</sub> and ocean acidification on the growth and nitrogen fixation of *Nodularia* from the Baltic Sea. The authors report that elevated CO<sub>2</sub> lead to decreased growth rates and nitrogen fixation while C quota and C:N go up, and the C:P ratio is constant. These data are really interesting as the impacts on growth and N<sub>2</sub> fixation at least are very different from the reported effects of higher CO<sub>2</sub> on another diazotrophic cyanobacterium, *Trichodesmium*.

The work has been well designed and carried out, and is discussed carefully. I have no real criticism of the paper but have a couple of points that the authors may like to

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consider:

1) Given the current controversy about altering CO<sub>2</sub> by acidifying the medium vs bubbling with CO<sub>2</sub>, some justification for choosing acidification, with the change in alkalinity this brings about, could have been included.

2) I wonder whether, given the propensity of *Nodularia* to form large blooms and cell clumps, extension of the study to compare aggregated vs homogeneous cultures might be warranted and discussed at least.

I am intrigued by the suggestion that another cyanobacterium, *Anabaena*, may show a different response - is this closer to that of *Trichodesmium* or a different response again? A bit more information would be useful.

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