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Interactive comment on “Growth increment periodicity in the shell of the razor clam *Ensis directus* using stable isotopes as a method to validate age” by J. F. M. F. Cardoso et al.

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Overall comments This is a very nice study of growth increment formation in *Ensis directus* and the use of the stable oxygen isotope response to seawater temperatures to validate annual periodicity. The research is described very clearly in the text, with appropriate, uncluttered and informative Figures. I would recommend very few changes or additions as far as the substantive science is concerned (and these are all minor suggestions). Most of the points I make below relate to typographical errors or attempt to improve some phraseology

P 4305 L 26: ... may cause errors in age determination to be made on the basis of ...

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P4306 L 5 ‘extend’ rather than ‘extent’

P4307 L 17 ‘Building’ rather than ‘Buiding’

L 20 It would also be interesting to know the depth at which the bivalve were collected.

P4309 I think it would help the reader to have a picture showing the transects used to mill the samples.

P4310 L 4 ‘near’ rather than ‘nearby’

P4311 L 10 ... four lines were considered to be annual by analysis ...

L 12 ‘shell 6’. There is no shell 6

P4312 L 10-12 I suggest rephrasing this as follows: ‘By matching measured and predicted values, all the $\delta^{18}O_S$ samples were assigned to the months April to October, with most samples being assigned to June to September’

L 23 ‘The age ...’ rather than ‘Age ...’

L 25 ‘Age estimation took account of the fact that all shells ...’

P4313 L 3 ‘...to be ...’ rather than ‘...as being ...’

L 6 Since the ‘last period of growth’ might be interpreted as the period since the last increment, I suggest rephrasing this in terms of increments, eg ‘... the last complete increment was considered to have occurred in 2009 ...’

LL 3 – 7 On a more general point, when I’ve just had my fourth birthday I call myself ‘four years old’, even though I’m in my fifth year. So I think your shells should be described as one year younger than you say.

L 17 I suggest ‘was’ rather than ‘could be’

P4314 L 13 ‘... and that the growth stop occurs ...’

L 16 As this is the first time have referred to *A. islandica*, you need to use its full

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designation.

P4315 LL 11 – 19 Do you detect any extra increments or disturbance lines associated with this event ?

P4316 LL 10 – 12 $\delta^{13}\text{C}_\text{S}$ is markedly lower at the growth line – it is usually the lowest value each year. This would tend to support the idea that more metabolic carbon is used at this time (since metabolic carbon is very depleted in ^{13}C)

LL 18 – 20 Although you say here that growth resumes around April -and the $\delta^{18}\text{O}$ measurements support that interpretation, I did notice that in Figure S3 there seems to be no growth until July. Is that just a lack of resolution in the field measurements (unfortunately I can't access Witbaard et al 2012) ?

P4317 LL 1 - 2 same point about the ages as P 4313 above.

LL 18 – 20 I suggest rephrasing as follows: "In contrast, shell growth in the present study was in general higher than that observed off the English east coast (Palmer, 2004). The mean annual temperature pattern in the Dutch Wadden Sea and off the Dutch North Sea coast is similar ...'

P4318 L 3 'reflection' rather than 'reflexion'

References Can you check the cross references – I noticed that Keith et al, Khim et al and Krantz et al 1987 are in the reference list but do not appear in the paper (and I only checked the Ks!)

Figures Fig 3 – The axes are not labelled. Also, I suggest you take out the first (leftmost) date on the x-axis. That's because all the other dates come just before a growth line, and it's a bit misleading to have a date there which isn't followed by a vertical line.

Supplementary material Fig S2 – In the top plot, 'Shell' is missing the final 'l' Fig S3 – As the text refers to months (eg 'July and August' on P4313 L 22), could you also use months (as words) in the caption?

BGD

10, C1030–C1033, 2013

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