frontiers | Frontiers in Marine Science

TYPE Correction
PUBLISHED 08 December 2023
DOI 10.3389/fmars.2023.1327753

OPEN ACCESS

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RECEIVED 25 October 2023
ACCEPTED 28 November 2023
PUBLISHED 08 December 2023

CITATION
Landes AM, Sunde J and Christophersen G (2023) Corrigendum: Effect of live-storage period and temperature on oxygen consumption rate in the cold-water sea cucumber *Parastichopus tremulus*. *Front. Mar. Sci.* 10:1327753. doi: 10.3389/fmars.2023.1327753

Corrigendum: Effect of live-storage period and temperature on oxygen consumption rate in the cold-water sea cucumber *Parastichopus tremulus*

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KEYWORDS

sea cucumber, Holothuroidea, Parastichopus tremulus, oxygen consumption, live-storage, temperature, condition index

A Corrigendum on

Effect of live-storage period and temperature on oxygen consumption rate in the cold-water sea cucumber *Parastichopus tremulus*

by Landes AM, Sunde J and Christophersen G (2023) *Front. Mar. Sci.* 10:1248840. doi: 10.3389/fmars.2023.1248840

In the published article, there was an error in Figure 1 and Figure 3 as well as in Table 1 and Table 2 as published. The authors discovered a continuous error throughout all calculations used to determine oxygen consumption rate (OCR) in *Parastichopus tremulus*. Instead of using oxygen partial pressure (as required), air pressure was erroneously used. Since air temperature was stable throughout the experiments, oxygen density in air followed the atmospheric pressure and the proportion remained the same throughout all measurements. Therefore, the overall relation between the OCR measured at different times and in different treatments remained the same, the statistical results still applied, and all general findings remained correct. In effect, only the scale (y-axis) had to be corrected in Figures 1 and 3. The corrected Figure 1 and Figure 3 and their captions appear below. In Tables 1 and 2, numerical values given for OCR had to be updated. The corrected Table 1 and Table 2 and their captions appear below.

The authors apologize for this error and state that this does not change the scientific conclusions of the article in any way. The original article has been updated.

In the published article, there was an error. Due to the continuous calculation error mentioned above, the numerical values of oxygen consumption rates mentioned in the text were incorrect. The text itself remained unchanged.

A correction has been made to **Results**, *3.1 Effect of live-storage period*, Paragraph 1. These two consecutive sentences previously stated:

"Weight specific OCR in animals kept for up to 5 weeks remained at similar levels (Figure 1, FT-1, one-way ANOVA, p=0.593), while OCR measurements after 10 weeks

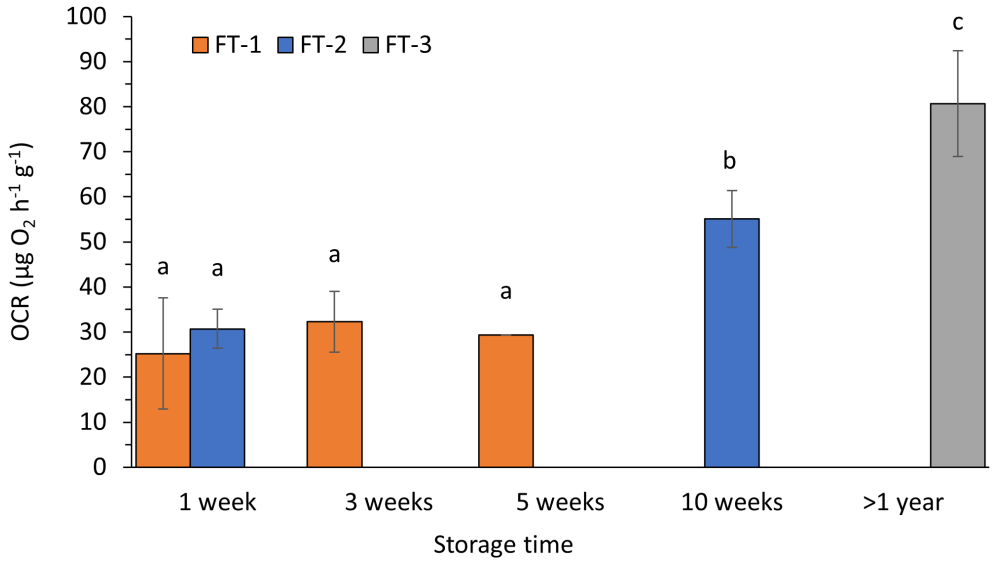

FIGURE 1
Oxygen consumption rates (OCR) per hour and gram body wall dry weight in *P. tremulus* from three sampling groups (1-3) at different live-storage time in a flow-through seawater system (FT). Data are average ± SD of three consecutive measurements per sampling point. Different letters denote significant different values.

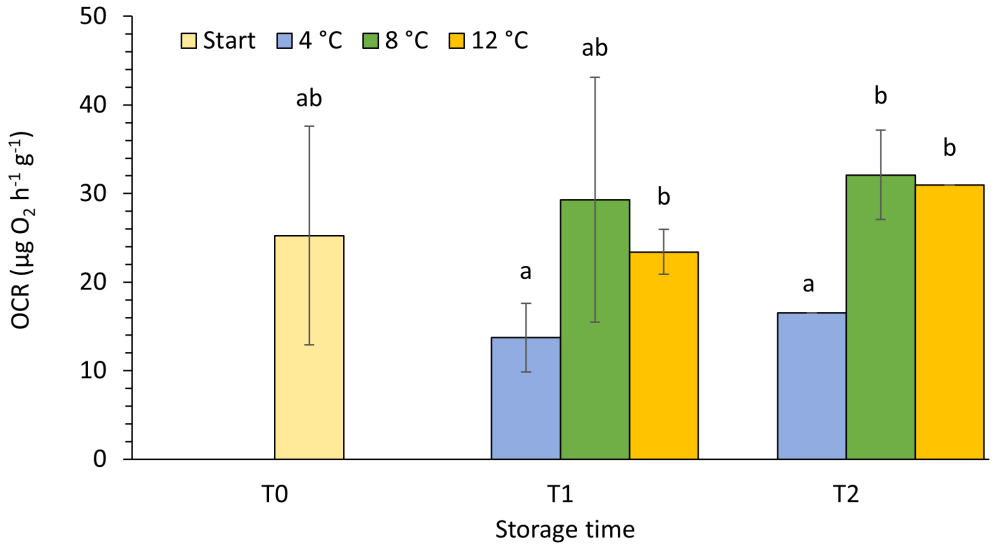

FIGURE 3
Oxygen consumption rates (OCR) per gram body wall dry weight and hour in *P. tremulus* at experimental start (T0), after 2 (T1) and 4 (T2) weeks live-storage at three different temperatures (4, 8 and 12°C). Data are average ± SD of three consecutive measurements per sampling point. Different letters denote significant different values.

of live-storage showed a significant increase from initially ~150 µg O_2 $h^{-1}g^{-1}$ body wall dry weight (BW DW) to ~270 µg O_2 (Figure 1, FT-2, unequal variances t-test, p=0.005). Sea cucumbers, kept in the flow-through seawater system >1 year, displayed even higher OCR of ~390 µg O_2 $h^{-1}g^{-1}$ BW DW (Figure 1, FT-3, unequal variances t-test, p=0.045)."

The two corrected consecutive sentences appear below:

"Weight specific OCR in animals kept for up to 5 weeks remained at similar levels (Figure 1, FT-1, one-way ANOVA, p=0.593), while OCR measurements after 10 weeks of live-storage showed a significant increase from initially ~31 µg O_2 $h^{-1}g^{-1}$ body wall dry weight (BW DW) to ~55 µg O_2 (Figure 1, FT-2, unequal variances t-test, p=0.005). Sea cucumbers, kept in the flow-through seawater system >1 year, displayed even higher OCR of ~81 µg O_2 $h^{-1}g^{-1}$ BW DW (Figure 1, FT-3, unequal variances t-test, p=0.045)."

Another correction has been made to **Results**, *3.2 Effect of temperature during short-term live-storage*, Paragraph 1. The original sentences previously stated:

TABLE 1 Oxygen consumption rates (OCR) per group of three individuals are average ± SD of three consecutive measurements.

			Individual measurements (n=3)			
Storage period	Temperature (°C)	OCR (mg O_2 h^{-1})	Length (mm)	Total WW (g)	BW WW (g)	BW DW (g)
1 week	11.7 ± 0.1	0.487 ± 0.069	146.1 ± 25.3	97.15 ± 34.47	49.75 ± 14.44	5.28 ± 1.60
	11.7 ± 0.1	0.528 ± 0.258	126.7 ± 15.3	108.35 ± 39.34	67.27 ± 13.38	7.05 ± 1.98
3 weeks	11.2 ± 0.1	0.808 ± 0.168	165.0 ± 65.4	122.69 ± 63.74	70.94 ± 34.61	8.34 ± 4.99
5 weeks	9.7 ± 0.1	0.451 ± 0.000	116.0 ± 21.6	75.64 ± 45.52	47.88 ± 22.61	5.12 ± 2.84
10 weeks	11.6 ± 0.1	0.947 ± 0.108	123.0 ± 33.9	76.10 ± 45.28	54.48 ± 30.18	5.73 ± 3.64
>1 year	11.6 ± 0.1	1.123 ± 0.163	120.7 ± 36.9	85.39 ± 6.83	47.78 ± 3.53	4.64 ± 0.35

Body length, total wet weight (WW), body wall wet weight (BW WW) and body wall dry weight (BW DW) are average ± SD of three individuals. Temperatures are average ± SD during the period of live-storage in flow-through seawater system.

TABLE 2 Oxygen consumption rate (OCR) per group of three individuals are average ± SD of three consecutive measurements.

			Individual measurements (n=3)			
Storage period	Temperature (°C)	OCR (mg O_2 h^{-1})	Length (mm)	Total WW (g)	BW WW (g)	BW DW (g)
T0	11.7 ± 0.1	0.487 ± 0.069	146.1 ± 25.3	97.15 ± 34.47	49.75 ± 14.44	5.28 ± 1.60
T1	4.3 ± 0.1	0.316 ± 0.089	170.0 ± 43.6	133.17 ± 13.02	69.12 ± 24.29	7.68 ± 4.04
	8.4 ± 0.4	0.536 ± 0.253	125.7 ± 14.0	87.22 ± 18.94	54.66 ± 12.30	6.10 ± 1.63
	12.1 ± 0.3	0.570 ± 0.062	136.7 ± 15.3	134.77 ± 52.03	73.20 ± 25.99	8.12 ± 3.02
T2	4.2 ± 0.1	0.256 ± 0.000	114.7 ± 10.0	91.42 ± 23.76	42.85 ± 4.12	5.17 ± 0.12
	8.5 ± 0.4	0.520 ± 0.082	131.3 ± 18.8	84.98 ± 39.89	49.23 ± 18.34	5.40 ± 2.51
	12.2 ± 0.3	0.613 ± 0.000	146.7 ± 25.7	127.08 ± 14.72	64.01 ± 7.99	6.59 ± 0.54

Body length, total wet weight (WW), body wall wet weight (BW WW) and body wall dry weight (BW DW) are average ± SD of three individuals. Temperatures are average ± SD during the storage time in flow-through (T0) and in recirculation (T1 and T2) seawater system.

"While oxygen demand at 4°C had almost halved compared to initial measurements at T0, consumption at 8 and 12°C remained unchanged at about 150 µg O_2 $h^{-1}g^{-1}$ dry weight throughout the four-week period."

The corrected sentence appears below:

"While oxygen demand at 4°C had almost halved compared to initial measurements at T0, consumption at 8 and 12°C remained unchanged at about 31 µg O_2 $h^{-1}g^{-1}$ dry weight throughout the four-week period."

A correction has been made to **Discussion**, Paragraph 1.

The sentence previously stated:

"The highest OCR values measured in this study (~390 µg O_2 $g^{-1}h^{-1}$) were associated with animals that had been fed regularly and stored for more than a year, but also animals kept without supplementary feed had a significantly higher oxygen demand (~270 µg O_2 $g^{-1}h^{-1}$ vs. ~150 µg O_2 $g^{-1}h^{-1}$) after 10 weeks of storage when compared with animals just brought in to the lab."

The corrected sentence appears below:

"The highest OCR values measured in this study (~81 µg O_2 $h^{-1}g^{-1}$) were associated with animals that had been fed regularly and stored for more than a year, but also animals kept without supplementary feed had a significantly higher oxygen demand (~55 µg O_2 h^{-1} g^{-1} vs. ~31 µg O_2 $h^{-1}g^{-1}$) after 10 weeks of storage when compared with animals just brought in to the lab."

A correction has been made to **Discussion**, Paragraph 5.

The sentence previously stated:

"Measurements conducted at 4°C after two weeks (T1) of acclimation in the lab revealed a mean consumption of 1.54 mg O_2 per group of three individuals per hour (mean 133 g wet weight per individual)."

The corrected sentence appears below:

"Measurements conducted at 4°C after two weeks (T1) of acclimation in the lab revealed a mean consumption of 0.32 mg O_2 per group of three individuals per hour (mean 133 g wet weight per individual)."

A correction has been made to **Discussion**, Paragraph 6.

These two consecutive sentences previously stated:

"He conducted measurements at 6°C and measured individual rates that ranged from 130 up to 427 µg O_2 $h^{-1}g$ WW^{-1}. The mean OCR of the one individual (130 g wet weight) measured by Fox (1936) was 334 µg O_2 $h^{-1}g$ WW^{-1}. Using total wet weight as reference, our converted values translate to average 790 µg O_2 $h^{-1}g$ WW^{-1} for individuals kept at 12°C and average 513 µg O_2 $h^{-1}g$ WW^{-1} for individuals kept at 4°C."

The two corrected consecutive sentences appear below:

"He conducted measurements at 6°C and measured individual rates that ranged from 0.7 up to 2.3 μg O_2 h^{-1}g WW^{-1}. The mean OCR of the one individual (130 g wet weight) measured by Fox (1936) was 1.8 μg O_2 h^{-1}g WW^{-1}. Using total wet weight as reference, our converted values translate to average 1.65 μg O_2 h^{-1}g WW^{-1} for individuals kept at 12°C and average 0.86 μg O_2 h^{-1}g WW^{-1} for individuals kept at 4°C."

The sentence previously stated:

"Newell and Courtney (1965) measured consumption rates of 23.14 to 66.43 μg O_2 h^{-1}g DW^{-1} in adult *Holothuria forskali* at 17°C, compared to our measurements of 67 μg O_2 h^{-1}g DW^{-1} in adult *P. tremulus* at 4°C and 156 μg O_2 h^{-1}g DW^{-1}at 12°C."

The corrected sentence appears below:

"Newell and Courtney (1965) measured consumption rates of 23.14 to 66.43 μg O_2 h^{-1}g DW^{-1} in adult *Holothuria forskali* at 17°C, compared to our measurements of 15 μg O_2 h^{-1}g DW^{-1} in adult *P. tremulus* at 4°C and 27 μg O_2 h^{-1}g DW^{-1} at 12°C."

The authors apologize for this error and state that this does not change the scientific conclusions of the article in any way. The original article has been updated.

Publisher's note