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Supplementary material

Voltammetric characterisation of macroalgae-exuded organic ligands (L) in response to Cu and Zn: a source and stimuli for L

Hollydawn Murray,[A,C,D] *Guillaume Meunier*,[A] *Constant M.G. van den Berg*,[B] *Rachel Cave*[A] *and Dagmar B. Stengel*[C]

[A]Earth and Ocean Sciences, School of Natural Science, National University of Ireland Galway, Galway, Ireland

[B]Oceanography Laboratory, Department of Earth Science, University of Liverpool, Liverpool, United Kingdom

[C]Botany and Plant Sciences, School of Natural Science, National University of Ireland Galway, Galway, Ireland

[D]Corresponding author. Email: hollydawn.murray@gmail.com

Table S1. Artificial seawater used for cultures, prepared according to Kester[1]

Salt	Concentration in solution
Sodium chloride	23.926 g kg^{-1}
Sodium sulfate	4.008 g kg^{-1}
Potassium chloride	0.677 g kg^{-1}
Sodium bicarbonate	0.196 g kg^{-1}
Potassium bromide	0.098 g kg^{-1}
Boric acid	0.026 g kg^{-1}
Sodium fluoride	0.003 g kg^{-1}
Magnesium chloride	0.0532 mol kg^{-1}
Calcium chloride	0.01033 mol kg^{-1}
Strontium chloride	0.00009 mol kg^{-1}

Table S2. Accuracy of the analytical procedures employed for seaweed metal concentration and seawater total dissolved metal concentration (mean ± s.d., *n* = 3)

The algal CRM (NIES number 9) was certified by the National Institute of Environment Studies, Japan Environment Agency. The near-shore seawater CRM (CASS-5) was certified by the National Research Council of Canada

	NIES number 9			CASS-5		
Element	Measured (µg g^{-1} DW)	RSD (%)	Certified (µg g^{-1} DW)	Measured (nM)	RSD (%)	Certified (nM)
Cu	5.001 ± 0.58	11.59	4.9 ± 0.20	5.21 ± 0.19	3.64	5.97 ± 0.44
Zn	16.13 ± 0.21	1.31	15.6 ± 1.20	16.36 ± 0.25	1.52	10.92 ± 1.034

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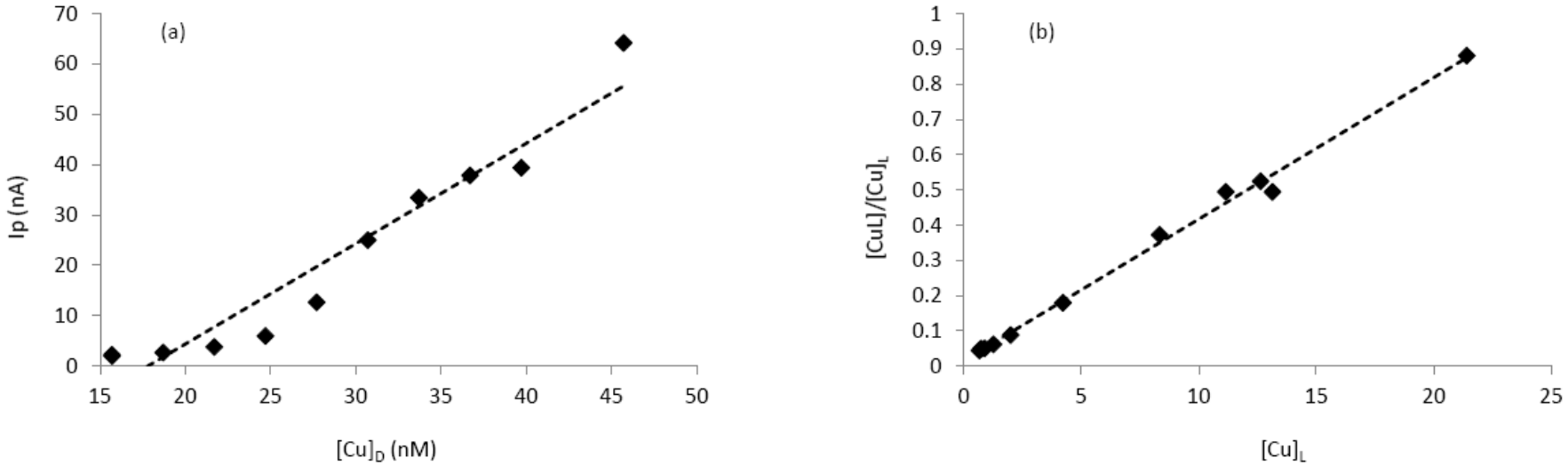

Fig. S1. Representative titration curve for the day 1, 15.70 nM Cu treated *L. hyperborea* culture: (a) the current (nA) plotted *v.* the total amount of Cu (nM), and (b) the linear least-squares fit using the van den Berg method.[2]

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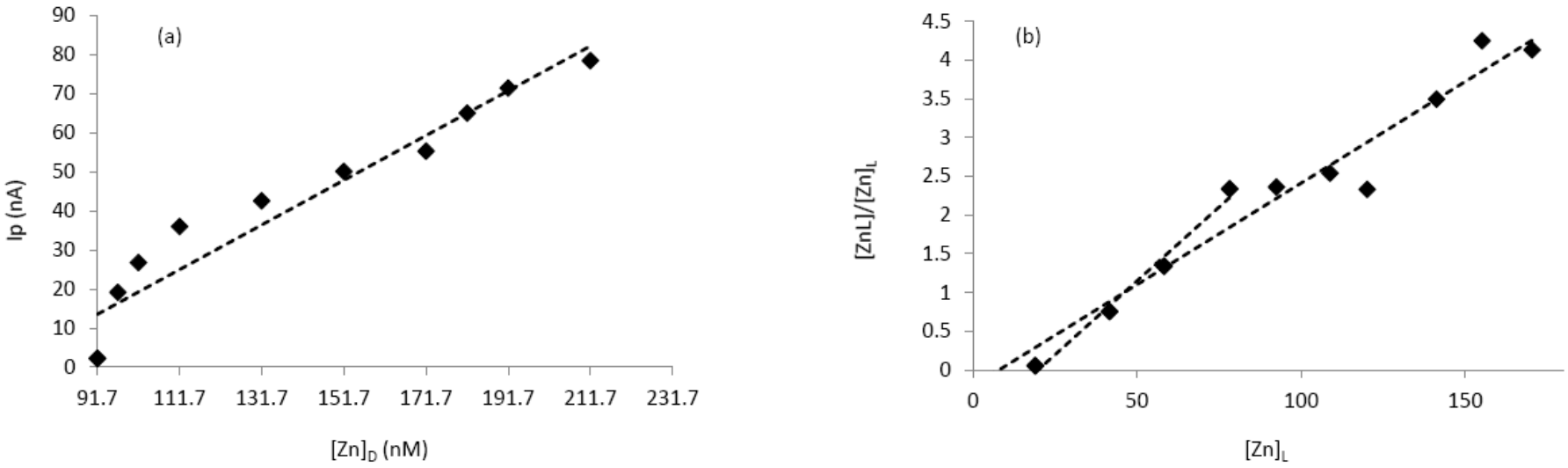

Fig. S2. Representative titration curve for the day 1, 91.70 nM Zn treated *L. hyperborea* culture: (a) the current (nA) plotted *v.* the total amount of Zn (nM), and (b) the linear least-squares fit using the van den Berg method.[2]

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[2] C. M. G. van den Berg, Determination of copper complexation with natural organic ligands in seawater by equilibration with MnO_2 I. Theory. *Mar. Chem.* **1982**, *11*, 307. doi:10.1016/0304-4203(82)90028-7