**Supplementary Methods**

***Pseudooceanicola algae* sp. nov., isolated from the marine macroalga *Fucus spiralis*, shows genomic and physiological adaptations for an algal associated lifestyle**

*Analysis of respiratory quinones and cellular fatty acids*

Respiratory quinones were extracted from 100 mg freeze dried cells following the standard protocols by Tindall [1, 2]. Cellular fatty acids were extracted from a growing culture on Marine Agar (20°C, 48 h, dark) using the Sherlock MIS (MIDI Inc, Newark, USA) system as described (<https://www.dsmz.de/services/services-microorganisms/identification/analysis-of-cellular-fatty-acids.html>).

*Tolerance to the heavy metals arsenate, arsenite and copper*

Heavy metal tolerance was tested in diluted (1/5th) MB medium and on MB agar plates. Stocks of heavy metals were prepared as sterile filtered, aqueous solution of 50 mM CuCl2\*2H2O, 100 mM Na2HAsO4\*7H2O (disodium hydrogen arsenate) and 100 mM NaAsO2 (sodium arsenite). Stock solutions were added to autoclaved hand-warm medium with final concentrations of 0.04, 0.075 and 0.1 mM CuCl2 or 1 mM of arsenate/arsenite. Tests were done in triplicates, with medium containing no heavy metals serving as controls. Pre-cultures were grown in diluted (1/5th) MB and liquid cultures treated as described for the substrate tests. Plates were inoculated with cells grown on MB plates for one week. Plates and liquid cultures were visually inspected daily for growth or measured at OD600, respectively. Liquid cultures of CuCl2 gave no reliable OD600 values due to the blue coloration and analysis was thus solely performed on agar plates. As negative control we used *Phaeobacter inhibens* DSM 17395, a strain harboring no copper resistance genes.

*Reduction of nitrate and nitrite.*

Reduction of nitrate and nitrite was tested in anoxic ASW+MB containing 0.5 g/L resazurin[3]. After autoclaving, the medium was reduced by addition of ~1 mg sterile sodium sulfate (1 ml/L) and placed into test tubes containing a small inverted glass tube. The headspace was flushed with N2/CO2 (80:20, v/v) and the tubes were sealed. Glucose, sodium nitrate or sodium nitrite were added to a final concentration of 5 mM, respectively. Cells were pre‑cultured in MB to exponential phase and added to the anaerobic medium to 2% (v/v). As control, only glucose was added without nitrate or nitrite. Cultures were incubated at 20°C and 150 rpm shaking. Growth was monitored by measuring the OD600.

*Production of volatile organic compounds (VOCs) and acyl-homoserine lactones (AHLs).*

Analysis of AHLs and VOCs was performed from 100 mL cultures, grown in MB (28°C, 160 pm) for three days. AHLs were extracted with Soxhlet precleaned Amberlite XAD‑16, separated from the culture by filtration and extracted three times with CH2Cl2/water (10:1) [4]. Combined organic phases were dried with MgSO4, the solvent removed under reduced pressure and the extract dissolved in 50 µL CH2Cl2, followed by GC/MS. For VOC analysis, headspace extraction by CLSA using active charcoal filters was performed as described earlier [5]. The active charcoal filter was extracted three times with 20 µL CH2Cl2 and analyzed by GC/MS. XAD and CLSA extracts were analyzed on an Agilent GC 7890A or B, connected to Agilent 5975C or 5977A mass-selective detectors, equipped with a HP-5 MS fused-silica capillary column (30 m x 0.25 mm i.d., 0.22 µm film; Hewlett-Packard), respectively. Conditions were as follows: carrier gas (He): 1.2 ml/min; injection volume: 1 mL; injector: 250°C; transfer line: 300°C, EI 70 eV. The gas chromatograph was programmed as follows: 50°C (5 min isothermal), increasing with 5°C min-1 to 320°C, and operated in splitless mode. Gas chromatographic retention indices, RI, were determined from a homologous series of *n*-alkanes.

Graphics

The picture of *Fucus spiralis* used in Fig. 5 and the graphical abstract was obtained from the corresponding Wikipedia article (https://en.wikipedia.org/wiki/Fucus\_spiralis). It has originally been used as a stamp from the Faeroe Islands and released into the public domain by its copyright holder for free use by anyone and for any purpose.

References

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