

Table S1. Summary of all tests (bioassays with fresh *Chara* material and extracts; mean of the replicates): (*Chl. vulg.*) *Chlorella vulgaris*; (*Acu. acu.*) *Acutodesmus acuminatus*; (*Syn. elo.*) *Synechococcus elongatus*; (*Syn. leop.*) *Synechococcus leopoliensis*; (*A. fischeri*) *Aliivibrio fischeri*; (DCM) dichloromethane; (MeOH) methanol; (ND) not determined; (–) no inhibition of microalgae growth (homogenous growth); (+) inhibition zone < 1.5 mm; (++) inhibition zone 1.5 to ≤ 5.0 mm; (+++) inhibition zone of > 5.0 mm. Inhibition in *A. fischeri* assays was defined as a > 20 % decrement in bioluminescence.

<i>Chara</i> species	Extract	<i>Chl. vulg.</i>	<i>Acu. acu.</i>	<i>Syn. elo.</i>	<i>Syn. leop.</i>	<i>A. fischeri</i> [inhibition in %]
<i>Chara aspera</i>	DCM lyophilised	–	–	–	–	28
Lake	MeOH lyophilised	–	–	+	–	33
Millstättersee	DCM air dried	–	–	–	–	21
	MeOH air dried	–	–	–	–	27
	DCM ice	–	–	–	–	5
	n–butanol ice	–	+++	+	++	26
	Living <i>Chara</i> shoots	–	–	++	+++	ND
<i>Chara aspera</i>	DCM lyophilised	–	–	–	–	23
Lake Attersee	MeOH lyophilised	–	–	+	–	19
	DCM air dried	–	–	–	–	21
	MeOH air dried	–	–	–	–	30
	DCM ice	–	–	–	–	4
	n–butanol ice	–	–	+	–	3
	Living <i>Chara</i> shoots	–	–	+	+++	ND
<i>Chara globularis</i>	DCM lyophilised	–	–	–	–	22
Botanischer Garten	MeOH lyophilised	–	–	–	–	8
	DCM air dried	–	–	–	–	21
	MeOH air dried	–	–	–	–	14
	DCM ice	–	–	–	–	11
	n–butanol ice	–	+++	++	+++	27
	Living <i>Chara</i> shoots	–	–	++	+++	ND
<i>Chara globularis</i>	DCM lyophilised	–	–	–	–	30
Obere Drau	MeOH lyophilised	–	–	–	–	7
	DCM air dried	–	–	–	–	26
	MeOH air dried	–	–	–	–	33
	DCM ice	–	–	–	–	9
	n–butanol ice	–	+++	+	+	30
	Living <i>Chara</i> shoots	–	–	++	+++	ND
<i>Chara tomentosa</i>	DCM lyophilised	–	–	–	–	21
Lake Attersee	MeOH lyophilised	–	–	+	+++	19
	DCM air dried	–	–	–	–	17
	MeOH air dried	–	–	–	–	25
	DCM ice	–	–	–	–	7
	n–butanol ice	–	+++	+++	++	19

Table S1 Cont.

	Living <i>Chara</i> shoots	–	–	+	+++	ND
<i>Chara</i>	DCM lyophilised	–	–	–	–	16
<i>tomentosa</i>	MeOH lyophilised	–	–	–	–	2
Lake	DCM air dried	–	–	–	–	18
Neusiedlersee	MeOH air dried	–	–	+	–	4
	DCM ice	–	–	–	–	2
	n-butanol ice	–	+++	+	+	27
	Living <i>Chara</i> shoots	–	–	+	++	ND
<i>Chara rudis</i>	DCM lyophilised	–	–	–	–	28
Lake Lunzer	MeOH lyophilised	–	–	–	–	27
Untersee	DCM air dried	–	–	–	–	23
	MeOH air dried	–	–	–	–	23
	DCM ice	–	–	–	–	11
	n-butanol ice	–	+++	+	++	19
	Living <i>Chara</i> shoots	–	–	++	+++	ND
<i>Chara rudis</i>	DCM lyophilised	–	–	–	–	30
Lake Erlaufsee	MeOH lyophilised	–	–	–	–	29
	DCM air dried	–	–	–	–	24
	MeOH air dried	–	–	–	–	13
	DCM ice	–	–	–	++	24
	n-butanol ice	–	+++	+	+	28
	Living <i>Chara</i> shoots	–	–	++	+++	ND

Table S2. Volatile (a) and polar substances (b) of Characeae. ¹ BANKOVA et al. (2001), ² DOBLANDER (2013), ³ ORTNER (2012), ⁴ WIJUM–ANDERSEN et al. (1982), ⁵ ANTHONI et al. (1986).

(a) Known volatile substances of Characeae

Class	Compound
Acids	pyruvic acid ¹ nonanoic acid, 9-oxo ¹ hexanedioic acid ¹
Chlorinated compounds	chloroacetic acid ^{1,2} methane, oxybis [chloro–] ¹ chloropyruvic acid ^{1,2} dichloropyruvic acid ^{1,2} 2,3-dichlorobutyric acid ¹
Terpenoids	dihydroactinidiolide ¹ hexahydrofarnesylacetone ^{1,2,3} farnesylacetone ² geranylacetone ² phytol ²
Ketones	2-pentanone-4-hydroxy-4-methyl ¹ 2,5-hexanedione ¹ 2-pentadecanone, 6,10,14-trimethyl ¹ 2-butanone ¹
Esters	isopropyl myristate ¹
Ethers	diphenyl ether ¹
Hydrocarbons	heptadecane ¹ octadecane ¹ pentadecane, 2,6,10,14 tetramethyl– ¹ cyclohexane, undecyl– ¹ nonadecene ¹
Ionons	β-ionon ^{2,3}
Phenols	2,2'-methylenebis (4-methyl-6-tert-butylphenol) ²
Ammonium-Ions	charamine ⁵

(b) Known polar substances of Characeae

Sulphuric compounds	4-methylthio-1,2-dithiolane (Charatoxin) ^{2,4} 5-methylthio-1,2,3-trithiane ^{2,4}
Nucleosids	uridin ² adenosin ² thymidin ² guanosin ²
Amino acids	L-tryptophan ^{2,3}

Table S3. HPLC conditions for the analysis of polar and apolar extracts.

	Polar extracts	Apolar extracts
	Modified after DOBLANDER (2013)	
Column	Phenomenex Synergi Hydro RP, particle size: 4 μm , 150 $\times$ 3 mm, pore size: 80Å	Dionex Acclaim 120, C18, particle size: 3 μm , 150 $\times$ 2,1 mm, pore size: 120Å
Solvent A	Water	Water (acidified to pH = 3 with formic acid)
Solvent B	Acetonitrile	Acetonitrile
Gradient	0–5 min: 5 % solvent B	0–60 min: 0 to 100 % solvent B
	5–10 min: 5 to 25 % solvent B	60–70 min: 100 % solvent B
	10–11 min: 25–95 % solvent B	70–71 min: 100–0 % solvent B
	11–15 min: 95 % solvent B	71–80 min: 0 % solvent B
	15–16 min: 95–5 % solvent B	
	16–20 min: 5 % solvent B	
Oven temperature	30 °C	25 °C (room temperature)
Flow rate	0.4 ml.min ⁻¹	0.5 ml.min ⁻¹
Concentration of extracts	5 mg.ml ⁻¹	5 mg.ml ⁻¹
Injection volume	5 μl	20 μl
Detector	UV detector, D2 lamp (Shimadzu SPD–M20)	UV detector, D2 lamp (Shimadzu SPD–M20)