

Supplementary material

Highly branched isoprenoids: a novel tracer of diatom-based energy pathways in freshwater food webs

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Table S1. Highly branched isoprenoid (HBI) concentration (ng g⁻¹) of isomers I Ib and I Ic of all organisms in the present study

Isomers below the limit of detection are indicated by an en-dash (-); YOY, young-of-year

Organism	Sample code	Tissue	I Ib (ng g ⁻¹)	I Ic (ng g ⁻¹)	Total HBIs (ng g ⁻¹)
Macrophyte	OP-Mac-Fall	Whole	0.13	–	0.13
Sediment	OP-Sed-Su-4	Whole	1.46	0.09	1.54
Sediment	OP-Sed-Su-3	Whole	8.12	0.46	8.59
Sediment	OP-Sed-South-Arm	Whole	6.53	0.33	6.86
Sediment	OP-Sed-Su-2	Whole	7.3	0.19	7.5
Sediment	LTR-Sed-009	Whole	0.25	–	0.25
Sediment	LTR-Sed-Mid-0102	Whole	2.73	0.17	2.9
Sediment	LTR-Sed-510	Whole	0.22	0.01	0.23
Caddisfly	LTR-Cad-Su	Whole	0.02	–	0.02
Mussel	LTR-Muss-Su	Whole	0.04	–	0.04
Mussel	OP-Muss-Su-2	Whole	0.29	0.12	0.41
Mussel	OP-Muss-Su-2m	Whole	0.17	–	0.17
Mussel	OP-Muss-Su-3	Whole	0.58	–	0.58
Mussel	OP-Muss-A2	Whole	0.11	–	0.11
Snail	LTR-Sn-Sp-3	Whole	0.07	–	0.07
Snail	LTR-Sn-Sp-4	Whole	0.01	–	0.01
Snail	OP-Sn-Su-5	Whole	0.11	–	0.11
Zooplankton	LTR-Zoop-Deep-200	Whole	7.86	0.42	8.28
Zooplankton	LTR-Zoop-Su-200	Whole	32.96	1.91	34.86
Zooplankton	OP-Zoop-Su-200	Whole	63.54	0.01	63.55
Zooplankton	LTR-Zoop-Fa-100	Whole	4.4	0.21	4.61
Zooplankton	OP-Zoop-Fa-200	Whole	0.08	–	0.08
Zooplankton	OP-Zoop-Fa-200–2	Whole	0.1	–	0.1
Zooplankton	OP-Zoop-Fa-200	Whole	0.09	–	0.09
Cisco	OP-Cis-Sp-18	Whole	0.09	–	0.09
Cisco	OP-Cis-Sp-1c	Whole	0.3	–	0.3
Crayfish	LTR-Cray-Su	Whole	0.56	0.01	0.57
Crayfish	OP-Cray-Su-1	Whole	0.08	–	0.08
Creek chub	OP-Cree-chu-Sp-2c	Whole	1.14	–	1.15
Odonate	LTR-Od-Su-1	Whole	0.03	–	0.03
Preyfish	LTR-Preyf-Su-1	Whole	0.16	–	0.16
Preyfish	OP-Preyf-Win-1	Whole	0.01	–	0.01
Preyfish	OP-Preyf-Win-5	Whole	0.16	–	0.16
Pumpkinseed	LTR-Pump-Sp-2	Whole	0.06	–	0.06
Pumpkinseed	LTR-Pump-Sp-4	Whole	0.05	–	0.05
Pumpkinseed	OP-Pump-Sp-1	Whole	0.79	–	0.79
Pumpkinseed	OP-Pump-Sp-2	Whole	0.1	–	0.1
YOY yellow perch	OP-YOYperch-Sp-2	Whole	0.19	–	0.19

Organism	Sample code	Tissue	Iib (ng g ⁻¹)	Iic (ng g ⁻¹)	Total HBIs (ng g ⁻¹)
YOY yellow perch	OP-YOYperch-Su-1	Whole	0.11	–	0.11
Burbot	MLTBU16	Liver	0.03	–	0.03
Burbot	MLTRBU14	Liver	0.04	–	0.04
Burbot	MLTRBU17	Liver	0.02	–	0.02
Burbot	MLTRBU24	Liver	0.13	0.01	0.14
Burbot	MLTRBU22	Liver	0.05	–	0.05
Burbot	MOPBU14	Liver	0.02	–	0.02
Burbot	MOBU18	Liver	0.12	–	0.12
Burbot	MOPBU25	Liver	0.04	–	0.04
Burbot	MOBU34	Liver	0.02	–	0.02
Burbot	MOBU46	Liver	0.02	0.01	0.03
Burbot	MOBU67	Liver	0.02	–	0.02
Burbot	MLTBU2	Liver	0.06	–	0.06
Burbot	28BMOBU5	Liver	2.77	0.1	2.88
Burbot	29MOBU10	Liver	1.2	0.03	1.23
Burbot	30MOBU4	Liver	2.41	0.07	2.48
Burbot	31MLTRBU1	Liver	3.93	0.1	4.03
Burbot	32MLTRBU2	Liver	2.02	0.1	2.11
Burbot	33MLTRBU3	Liver	2.45	0.04	2.5
Lake trout	53MLTRLT3	Liver	65.97	4.58	70.55
Lake trout	54MLTRLT11	Liver	72.75	6	78.75
Lake trout	80MMLTRLT3	Muscle	13	0.18	13.18
Lake trout	79MMLTRLT14	Muscle	20.63	0.96	21.59
Lake trout	81MMLTRLT3	Muscle	25.86	0.66	26.52
Lake trout	37MOLT20	Liver	36.94	0.52	37.46
Lake trout	38MOLT14	Liver	4.94	0.03	4.98
Lake trout	39MOLT7	Liver	0.89	0.09	0.98
Lake trout	65MMOLT14	Muscle	2.39	0.08	2.47
Lake trout	64MMOLT20	Muscle	2.3	0.11	2.41
Lake trout	56MLTRLT31	Liver	15.48	0.15	15.63
Lake trout	57MLTRLT38	Liver	27.96	0.19	28.15
Lake trout	84MMLTRLT38	Muscle	2.37	0.09	2.46
Lake trout	82MMLTRLT29	Muscle	4.48	0.13	4.62
Lake trout	83MMLTRLT31	Muscle	6.18	0.18	6.35
Lake trout	69MMOLT28	Muscle	4.33	0.09	4.42
Lake trout	68MMOLT30	Muscle	3.86	0.09	3.95
Lake trout	87MMLTRLT53	Muscle	2.89	0.1	2.98
Lake trout	85MMLTRLT50	Muscle	3.9	0.07	3.97
Lake trout	86MMLTRLT46	Muscle	4.7	0.08	4.77
Lake trout	46MOLT48	Liver	18.5	0.04	18.54
Lake trout	44MOLT43	Liver	12.95	0.12	13.07
Lake trout	73MMOLT48	Muscle	3.72	0.08	3.79

Organism	Sample code	Tissue	Iib (ng g ⁻¹)	Iic (ng g ⁻¹)	Total HBIs (ng g ⁻¹)
Lake trout	70MMOLT46	Muscle	1.78	0.05	1.82
Lake trout	75MMOLT63	Muscle	2.62	0.07	2.69
Lake trout	74MMOLT59	Muscle	4.12	0.04	4.16
Lake trout	72MMOLT45	Muscle	3.03	0.07	3.1
Lake trout	71MMOLT43	Muscle	2.7	0.1	2.81
Lake trout	MOPLT115	Liver	0.76	–	0.77
Lake trout	OPGUPOL02	Liver	0.37	–	0.37
Lake trout	OPGUPOL05	Liver	0.47	–	0.47
Lake trout	62MLTRLT85	Liver	5.56	0.01	5.56
Lake trout	89MMLTRLT80	Muscle	3.17	0.04	3.21
Lake trout	88MMLTRLT68	Muscle	4.08	0.07	4.15
Lake trout	90MMLTRLT66	Muscle	3.68	0.08	3.76
Lake trout	MLTRLT146	Liver	1.37	0.01	1.38
Lake trout	MLTRLT75	Liver	0.63	–	0.63
Lake trout	77MMOLT69	Muscle	0.52	0.09	0.61
Lake Trout	76MMOLT79	Muscle	4.33	0.13	4.46
Smallmouth bass	17LTRSMB7	Liver	7.34	0.02	7.36
Smallmouth bass	16LTRSMB2	Liver	16.71	0.42	17.13
Smallmouth bass	18MLTRSMB18	Liver	50.56	0.03	50.59
Smallmouth bass	11MOSMB10	Liver	18.89	0.01	18.9
Smallmouth bass	12MOSMB7	Liver	22.07	0.2	22.28
Smallmouth bass	20LTRSMB30	Liver	15.06	0.24	15.29
Smallmouth bass	19MLTRSMB26	Liver	49.47	0.94	50.41
Smallmouth bass	21LTRSMB36	Liver	30.08	0.49	30.57
Smallmouth bass	15MOSMB32	Liver	1.21	0.43	1.64
Smallmouth bass	14MOSMB24	Liver	35.28	0.27	35.56
Smallmouth bass	24MLTRSMB42	Liver	47.22	0.51	47.73
Smallmouth bass	23LTRSMB41	Liver	20.97	0.46	21.43
Smallmouth bass	22LTRSMB40	Liver	31.94	0.04	31.99
Smallmouth bass	27LTRSMB51	Liver	22.96	0.48	23.44
Smallmouth bass	25LTRSMB45	Liver	27.15	0.39	27.54
Smallmouth bass	26MLTRSMB46	Liver	14.32	0.32	14.63
Yellow perch	9MLTRYP13	Liver	17.82	0.38	18.21
Yellow perch	7MLTRYP5	Liver	39.32	0.65	39.97
Yellow perch	8MLTRYP12	Liver	17.94	0.34	18.29
Yellow perch	5MOYP1	Liver	29.38	0.27	29.64
Yellow perch	6MOYP2	Liver	38.09	0.34	38.43
Yellow perch	4MOYP3	Liver	14.75	1.78	16.54
Sediment	OP-Sed-Su-1	Whole	–	–	–
Sediment	LTR-Sed-0101-Near	Whole	–	–	–
Mussel	OP-Muss-Su-18	Whole	–	–	–
Odonate	LTR-Od-Su-4	Whole	–	–	–

Organism	Sample code	Tissue	Iib (ng g ⁻¹)	Iic (ng g ⁻¹)	Total HBIs (ng g ⁻¹)
Snail	LTR-Sn-Su-5	Whole	-	-	-
Snail	OP-Sn-Su-2	Whole	-	-	-
Zooplankton	LTR-Zoop-Sp-200	Whole	-	-	-
Zooplankton	LTR-Zoop-Sp-100	Whole	-	-	-
Zooplankton	LTR-Zoop-Sp-200	Whole	-	-	-
Zooplankton	OP-Zoop-Sp-100	Whole	-	-	-
Zooplankton	OP-Zoop-Sp-100	Whole	-	-	-
Zooplankton	OP-Zoop-200-2019	Whole	-	-	-
Zooplankton	OP-Zoop-100um- 2019	Whole	-	-	-
Zooplankton	OP-Zoop-Sp-200	Whole	-	-	-
Zooplankton	LTR-Zoop-Su-100	Whole	-	-	-
Zooplankton	LTR-Zoop-1-01-100	Whole	-	-	-
Zooplankton	LTR-Zoop-01-01- 200	Whole	-	-	-
Zooplankton	LTR-Zoop-Deep-10- 100	Whole	-	-	-
Zooplankton	LTR-Zoop-Win-200	Whole	-	-	-
Zooplankton	LTR-Zoop-Win-100	Whole	-	-	-
Zooplankton	OP-Zoop-Win-100	Whole	-	-	-
Zooplankton	OP-Zoop-Win-200	Whole	-	-	-
Backswimmer	OP-MayBS-Sp-3	Whole	-	-	-
YOY smallmouth Bass	OP-YOYsmb-Sp-1	Whole	-	-	-
Burbot	MLTRLT67	Liver	-	-	-
Burbot	MLTRBU36	Liver	-	-	-
Burbot	MLTRBU30	Liver	-	-	-
Burbot	MLTRBU29	Liver	-	-	-
Burbot	MOBU13	Liver	-	-	-
Burbot	MOBU21	Liver	-	-	-
Burbot	MOPBU52	Liver	-	-	-
Burbot	MOPBU49	Liver	-	-	-
Burbot	MOPBU6	Liver	-	-	-
Burbot	MOBU68	Liver	-	-	-
Burbot	MOBU70	Liver	-	-	-
Burbot	MLTRBU1	Liver	-	-	-
Burbot	MLTRBU3	Liver	-	-	-
Burbot	MOBU3	Liver	-	-	-
Burbot	MOBU4	Liver	-	-	-
Lake trout	52MLTRLT14	Liver	-	-	-
Lake trout	66MMOLT7	Liver	-	-	-
Lake trout	MOPLT95	Liver	-	-	-
Lake trout	MOPLT102	Liver	-	-	-
Lake trout	42MOLT28	Liver	-	-	-

Organism	Sample code	Tissue	Iib (ng g ⁻¹)	Iic (ng g ⁻¹)	Total HBIs (ng g ⁻¹)
Lake trout	41MOLT30	Liver	-	-	-
Lake trout	40MOLT26	Liver	-	-	-
Lake trout	67MMOLT26	Liver	-	-	-
Lake trout	58MLTRLT50	Liver	-	-	-
Lake trout	59MLTRLT46	Liver	-	-	-
Lake trout	60LTRLT53	Liver	-	-	-
Lake trout	MLTRLT107	Liver	-	-	-
Lake trout	47MOLT59	Liver	-	-	-
Lake trout	48MOLT63	Liver	-	-	-
Lake trout	43MOLT46	Liver	-	-	-
Lake trout	45MOLT45	Liver	-	-	-
Lake trout	MOPLT109	Liver	-	-	-
Lake trout	OPGUPOL18	Liver	-	-	-
Lake trout	63MLTRLT66	Liver	-	-	-
Lake trout	61MLTRLT68	Liver	-	-	-
Lake trout	50MOLT68	Liver	-	-	-
Lake trout	51MOLT75	Liver	-	-	-
Lake trout	49MOLT79	Liver	-	-	-
Lake trout	78MMOLT75	Muscle	-	-	-
Smallmouth bass	10MOSMB3	Liver	-	-	-
Smallmouth bass	55MLTRSMB42	Liver	-	-	-
Smallmouth bass	13OSMB26	Liver	-	-	-
Yellow perch	7MLTRYP5	Liver	-	-	-

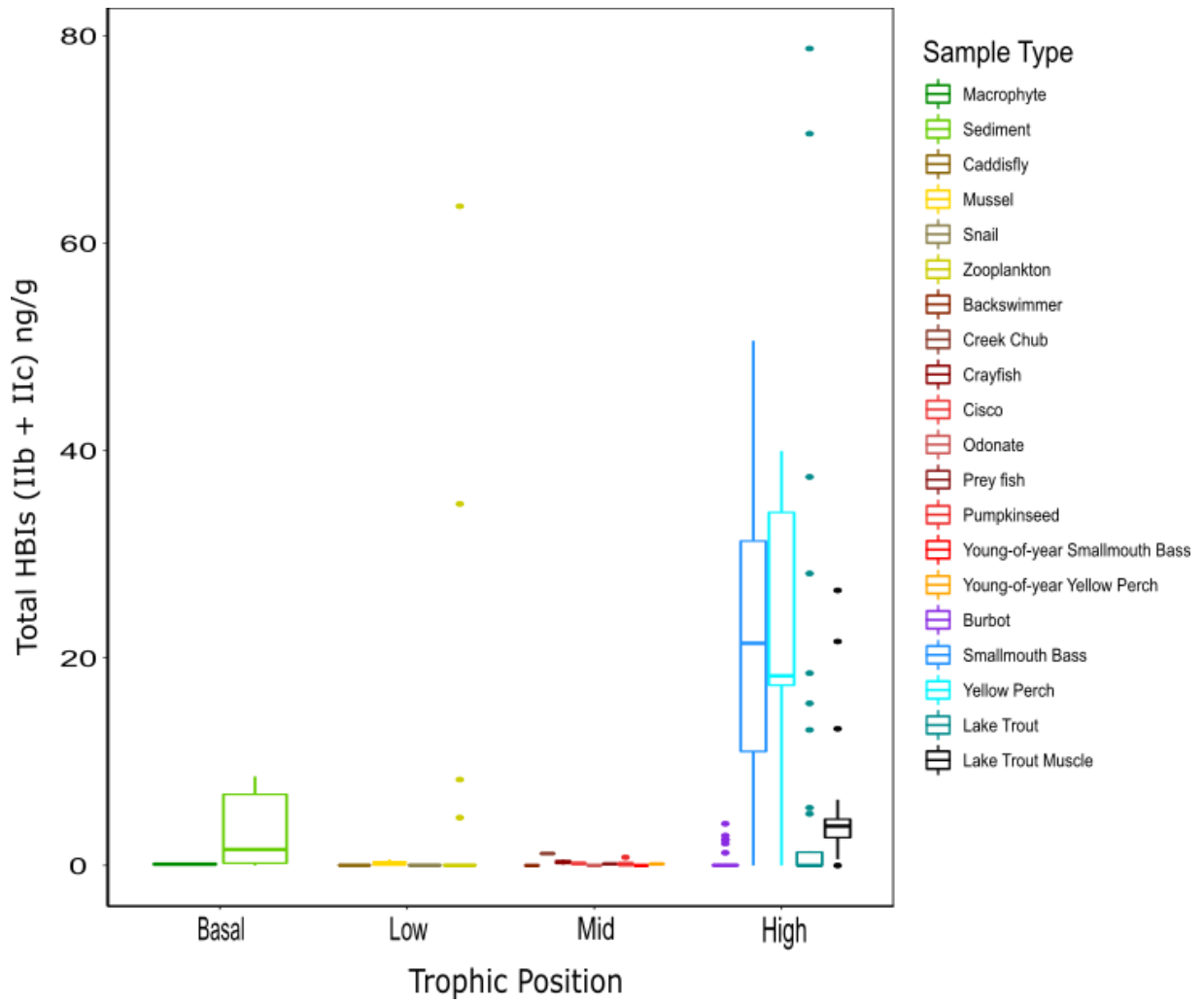


Fig. S1. Total highly branched isoprenoid (HBI) concentration (ng g^{-1}) of isomers IIb and IIc of all organisms in the present study categorised by trophic position.